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ASSESSING A MANAGEMENT CHANGE IN MENTAL HEALTH SCREENING USING A SWITCHING REPLICATIONS TIME-SERIES DESIGN

by

SUSAN ANN BORKOWSKI LUEGER

A Dissertation Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment
of the Requirements for the Degree of
DOCTOR OF PHILOSOPHY

December
1982

ACKNOWLEDGEMENTS

The author would like to thank committee members Dr. Emil J. Posavac, Dr. Frank L. Slaymaker, and Dr. Alan S. DeWolfe for their comments and advice. Valuable assistance was provided by the supervisory and consulting staff of the Loyola University Academic Computing Center. Thanks are also due to the Research and Statistics Section of the Kansas Department of Social and Rehabilitation Services, especially Ms. Sherri Krentz, Mr. Robert Kennedy, and Ms. Gail Sloyer for making these data available and for sharing their knowledge of the mental health system in Kansas.

Dr. Richard McCleary, Dr. Richard Hay and Dr. Lon-Mu Liu were generous with their time and advice. Their help was appreciated.

The author would like to thank Robert Lueger for his encouragement, support, and critiques during all phases of this work. Finally, she would like to thank her parents for understanding and being patient while this dissertation was being written.

VITA

The author, Susan Ann Borkowski Lueger, is the daughter of Leonard Joseph Borkowski and Haline (Ostojski) Borkowski. She was born October 27, 1953, on Chanute AFB, Rantoul, Illinois.

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In August, 1974, she was granted an assistantship in psychology at Wayne State University in Detroit, Michigan. She transferred to Loyola University of Chicago in August, 1975 and worked as a research assistant on a Law Enforcement Assistance Administration grant at Loyola. In February, 1975, she was granted a research assistantship at Loyola.

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From January to May, 1981, the author was an instructor at Washburn University of Topeka. The author also acted as a consultant to the Kansas Planning Council on Developmental Disabilities from February to August, 1981 and taught at Marquette University in Milwaukee, Wisconsin during the fall semesters of 1981 and 1982.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The purpose of this study is to assess whether a management decision to decentralize mental health screening in a state had a significant impact on admissions to its public mental hospitals. A community mental health center-based screening program was established. Its intent was to reduce State Hospital admissions, so that more people would be treated in their communities, as close to their homes and families as possible. A number of studies will be reviewed which indicate that, although the intent of establishing community mental health centers (CMHCs) was to reduce State Hospital admissions, CMHCs have not been associated with an appreciable decline in the use of State Hospitals. It is precisely for this reason that the State of Kansas instituted a voluntary CMHC-based screening program, called the Partnership Agreement for the Continuity of Treatment (PACT), on October 1, 1978, -- to reduce State Hospital admissions.

The results of this study were intended to help Kansas mental health officials to decide whether the PACT program should be continued as is, modified, or abandoned. It also aims to provide suggestions for improvements in the program, if it is to be continued. Finally, the study serves as an example of the use of an evaluation methodology, the interrupted multiple group time-series with switching replications, that is particularly well-suited to programs in which monthly or quarterly data are collected and where the programs are not simultaneously instituted on a statewide basis.

This chapter reviews some general background of CMHCs, more specific information on Kansas CMHCs and State Hospitals, and what the PACT program is and how it was implemented. Studies similar to this one are reviewed and compared with the present study. Finally, the objectives of the study are presented.

Studying the impact of a CMHC screening program is important because of the implications it has for the success of community programs serving the mentally ill, for the use of state mental health facilities, and for the distribution of limited resources, including money and staff. This study, in addition, may have important methodological implications. The multiple group time-series design used here has been employed in other studies of community based mental health screening programs and mental hospital admissions, but each study that used the design can be improved or modified by including all counties in a state, using switching replications, and using appropriate statistical analyses.

The Background

This section discusses the history and specifics of the Kansas Community Mental Health Centers, the PACT screening program and the Kansas State Mental Hospitals.

Community Mental Health Centers (CMHCs)

CMHCs were set up to drastically reduce the number of mentally ill patients in custodial care within 10-20 years after the enactment of the Community Mental Health Center Act. The original goal of the CMHCs is reflected in the PACT program's purpose. That goal was to provide and coordinate the elements of comprehensive services at the local level so patients could remain close to their own homes and to keep their links to family and community intact. Public Law 88-164 (Title II), enacted by President Kennedy in October, 1963, encouraged the further development of CMHCs with this aim.

Under the Federal mandate, CMHCs were funded and required to provide five basic services: inpatient care, outpatient care, partial hospitalization, emergency treatment, and consultation and education. Non-comprehensive mental health centers offer the five basic services, while comprehensive centers also offer pre-hospitalization care, after hospitalization follow-up and care (called aftercare), and must have a staff training program, as well as a research and evaluation function (Siguel, 1974).

Partial hospitalization is defined in Kansas as "a planned therapeutic program for persons who need a broader program than possible through outpatient visits but less than full time hospitalization" (Kansas Department of Social and Rehabilitation Services, 1981, p. 116). It is, in other words, the catchall for patients who do not need to be in the State Hospital or an inpatient unit for 24 hours a day, but who need more than the average number of outpatient sessions (7.73 sessions for comprehensive mental health center patients and 7.17 sessions for non-comprehensive mental health center patients in FY 1980). Consultation and education activities generally refer to the center's outreach activities. These activities include speeches to clubs, presentations to school children, or church groups on mental health topics, or assisting businesses in establishing counseling or treatment resources for their employees.

All of the Kansas CMHCs were established before FY 1974, except the Miami County CMHC and the Labette County CMHC (see Table 1). Both of these counties are rural, southeastern Kansas counties. The Miami CMHC was established in FY 1976, while the Labette CMHC was not established until FY 1978. In all, there are 35 Kansas CMHCs, but some of these are affiliated with each other and actually constitute 26 separate entities. Most Kansas CMHCs are supported by county mill levies (taxes), Federal funds, grants, State funds, fees and third party payments, such as insurance. Although the State does provide some funding to the CMHCs, state government does not constitute the largest source of funds for the Centers. The State has some regulatory power over the Centers as a result of its contribution, but the CMHCs are not run by the State. Typically, CMHCs are governed by a Board of Directors, made up of city and county officials, private citizens, and persons who directly or indirectly receive services from the CMHC.

In Fiscal Year (FY) 1980 (i.e., July 1, 1979 to July 1, 1980), the Kansas CMHCs served 64,160 people, a 2% increase over the previous year. The active monthly caseload for FY 1980 averaged 214 inpatients, 547

TABLE 1

Dates Kansas CMHCs Were Established

Date Established	Center
1961	Area
1950	Bert Nash
1964	Central Kansas
1968	Center for Counseling and Consultation
1968	Cowley County
1961	Crawford County
1960	Family Consultation Service
1958	Family Service and Guidance Center
1964	Four County
1958	Franklin County
1964	High Plains
1960	Holy Family Center
1968	Iroquois
1962	Johnson County (Mission)
1974	Johnson County (Olathe)
1963	Kanza
1978	LabetteCounty
1968	Mental Health Institute
1960	East Central Kansas
1976	Miami County
1956	North Central Kansas
1949	Northeast Kansas
1978	Pioneer
1977	Pawnee
1963	Prairie View
1972	Sedgwick County
1972	SEKAN
1972	SEKAN Inpatient Unit
1969	Shawnee
1961	South Central
1962	Southeast Kansas
1963	Southwest
1966	Sunflower
1929	Wichita Guidance Center
1953	Wyandot

partial hospitalization patients, and 19,483 outpatients. For those centers offering inpatient services, the number of inpatient treatment days per client has averaged 19-22 days for FY 1978-FY 1980. The most commonly reported diagnoses for FY 1978-FY 1980 are social maladjustments, adjustment reactions, transient situational disturbances, personality disorders and depressive neuroses, which all seem appropriate for CMHC intervention.

CMHCs were built with Federal construction grants, staffed with the help of Federal staffing grants, and since 1964 have been dependent to some extent on Federal funds. Some mental health center directors and staff in Kansas admit that, typically, local funds for the CMHCs have not been developed, since the influx of Federal funds seemed to be limitless. Now that the staffing grants are scheduled to end in 1982 and 1983 for many CMHCs, the centers are having to prove their necessity to state legislatures, city councils, county commissions, non-profit organizations such as the United Way, and private citizens.

The PACT Program

Partially because of the need to prove the worth of the CMHCs and as an effort to reemphasize the original goal of CMHCs, Kansas mental health officials from the Kansas Department of Social and Rehabilitation Services (SRS) believed that the CMHC - State Hospital system could perform more effectively by instituting a special screening program. The screening program called for the CMHCs to serve as the single entry point into the CMHC-State Hospital system. That is, before being admitted to a State Hospital, a patient from a participating CMHC service, or catchment, area must first be seen at the local CMHC. Participating CMHCs received some funds from SRS's Division of Mental Health and Retardation Services to assist them in covering program information reporting costs. The participating Centers also received reporting services from the State to assist them in answering their own management questions and to help them make presentations to Legislative committees, county commissioners and other groups.

The PACT program began on October 1, 1978. At first, only nine of the 29 Kansas CMHCs joined the voluntary program. One year later, partially due to a monetary incentive offered by the Kansas Department of Social and Rehabilitation Services (SRS), Division of Mental Health and Retardation Services to participating CMHCs, 15 more CMHCs joined the PACT screening program. Two more CMHCs joined the program on July 1, 1980, but the data for this study end with the June, 1980 State Hospital admissions. Currently, all but three of the 29 Kansas CMHCs are PACT participants. As a result, 102 out of 105 Kansas counties are involved in this screening program.

The FY 1980 Statistical Summary (Kansas Department of Social and Rehabilitation Services, 1981) shows that there were 646 PACT admissions to State Hospitals during the first year of the program (October, 1978 to September, 1979). These admissions constituted 19.9% of the total State Hospital admissions for that time period. During the second year of operation, when many more CMHCs had joined the PACT program, there were 1,449 PACT admissions to State Hospitals. This figure represents 44.5% of the total State Hospital admissions for October, 1979 to September, 1980. These percentages illustrate that the PACT program was operating as intended and that a larger proportion of persons admitted to the State Hospitals were being screened in the community as more CMHCs joined the program.

Nearly 48% of all patients from PACT counties during the second year of the program received some type of psychiatric screening before admission to a State Hospital. Clients not receiving mental health screening typically were using other community resources such as private practitioners or the University of Kansas Medical Center. Direct admissions such as walk-ins, night or after hours admissions, or persons brought in by police officers constituted only 17% of the total admissions to State Hospitals from PACT catchment areas.

One problem encountered by the PACT program is the limited number of State Hospital beds for voluntary admissions. Only 33% of the PACT admissions in FY 1980 were voluntary. In addition, the occupancy figures for September, 1980 reveal that the State Hospitals' adult programs are often operating at a 95-100% occupancy rate.

Kansas State Mental Hospitals

The State Hospitals obviously are an important part of the PACT program. These facilities are run and administered by the Kansas Department of Social and Rehabilitation Services (SRS), while the CMHCs are not directly governed by any State agency. SRS provides all of the funding for State Hospitals and partial funding for CMHCs. An annual statistical report released by SRS (1981) for FY 1980 describes the three State Hospitals -- Larned State Hospital, Osawatomie State Hospital, and Topeka State Hospital -- as well as another facility called the Rainbow Unit or Facility. Figure 1 depicts the three State Hospitals' catchment (service) areas and their locations.

The Larned State Hospital provides inpatient psychiatric care for children, adolescents, and adults from 51 counties in the western half of Kansas. The State Security Hospital is located on the Larned State Hospital grounds and provides care for patients who have committed crimes and for certain other psychiatric or mentally ill patients who require maximum security surroundings while receiving psychiatric care. The Larned State Hospital also has a special program for aggressive and assaultive mentally retarded patients who are transferred from facilities for the developmentally disabled.

The Osawatomie State Hospital serves persons from 23 southern and eastern Kansas counties. The hospital has psychiatric treatment programs for mentally ill patients 14 years of age and older, including special programs for adolescents, alcoholics, juvenile offenders, and senior citizens. Until July, 1978 the Hospital had a unit in Kansas City, Kansas as a part of its operation. The Rainbow Unit was separated from the Osawatomie State Hospital's jurisdiction and is now a separate institution known as the Rainbow Mental Health Facility. Osawatomie State Hospital continues to provide "back up" inpatient services to the Kansas City area.

The Rainbow Mental Health Facility provides inpatient and partial hospitalization on a short term basis to Johnson, Wyandotte, and other nearby county residents. These counties are part of the metropolitan

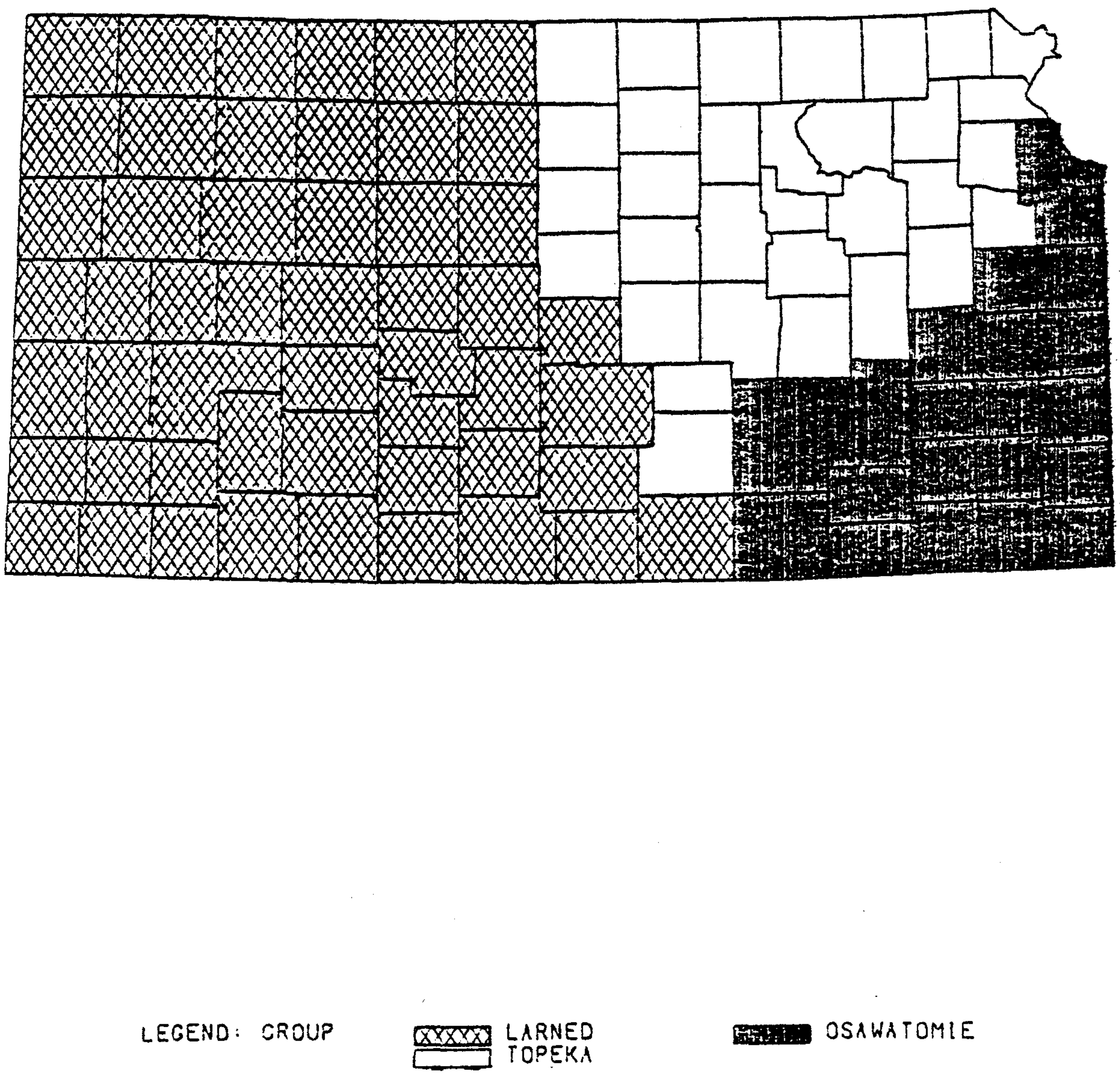


FIGURE 1: State Hospital catchment areas.

area of Kansas City, Kansas and Kansas City, Missouri. The Rainbow Facility is one of the inpatient units used by the CMHCs of the Kansas City area. Most CMHCs have their own inpatient units or a contract with local hospitals for psychiatric beds. The Rainbow Facility also provides psychiatric services for adults and children, as well as an alcohol treatment program.

The Topeka State Hospital, the smallest of the State Hospitals in terms of beds, provides psychiatric services for children, adolescents (this unit was scheduled to be closed at the end of calendar year 1982), and adult residents of 31 northeastern Kansas counties. Some special services include a Maturational Unit for adolescents with adjustment problems, a Transitional Living Unit for patients making the adjustment from hospital living to community living, and a Comprehensive Screening Unit for Youth to assist in the evaluation and placement of youth who are abused, neglected, deprived or who come to the court for the first time, or who are adjudicated (convicted) miscreant or delinquent and are referred to the Screening Unit. An alcohol treatment program was closed in FY 1979.

The average resident population of Kansas' four facilities declined by 41% between FY 1970 and FY 1980. No studies have been done to determine whether this decline was due to deinstitutionalization policies, increased CMHC activity, or other causes. The four facilities had an average resident population of 1,094 patients in FY 1980. The four facilities served 4,690 people in FY 1980, a decline of 15% over the last ten years. The hospitals admitted 3,636 people and discharged

3,685 people in FY 1980 (143 of the admissions were transfers from one of the other State Hospitals). Table 2 displays the admission and readmission data for FY 1964 to FY 1980, while Figure 2 is a graph of these data to give the reader an impression of how first admissions and readmissions have been fluctuating, on a yearly basis, since FY 1964.

Since FY 1970, the average length of stay at the four facilities has dropped 83%. The average length of stay was 114.3 days in FY 1980. Sixty-six percent of the patients admitted in FY 1980 stayed less than 60 days; 77% stayed less than 90 days; and 88% stayed less than six months. The most common diagnosis has been schizophrenia, which constitutes 28-32% of the admissions over the last 3 years. The number of first admissions peaked in FY 1973 and again in FY 1978, while readmissions peaked in FY 1974.

Summary of CMHCs and State Hospitals

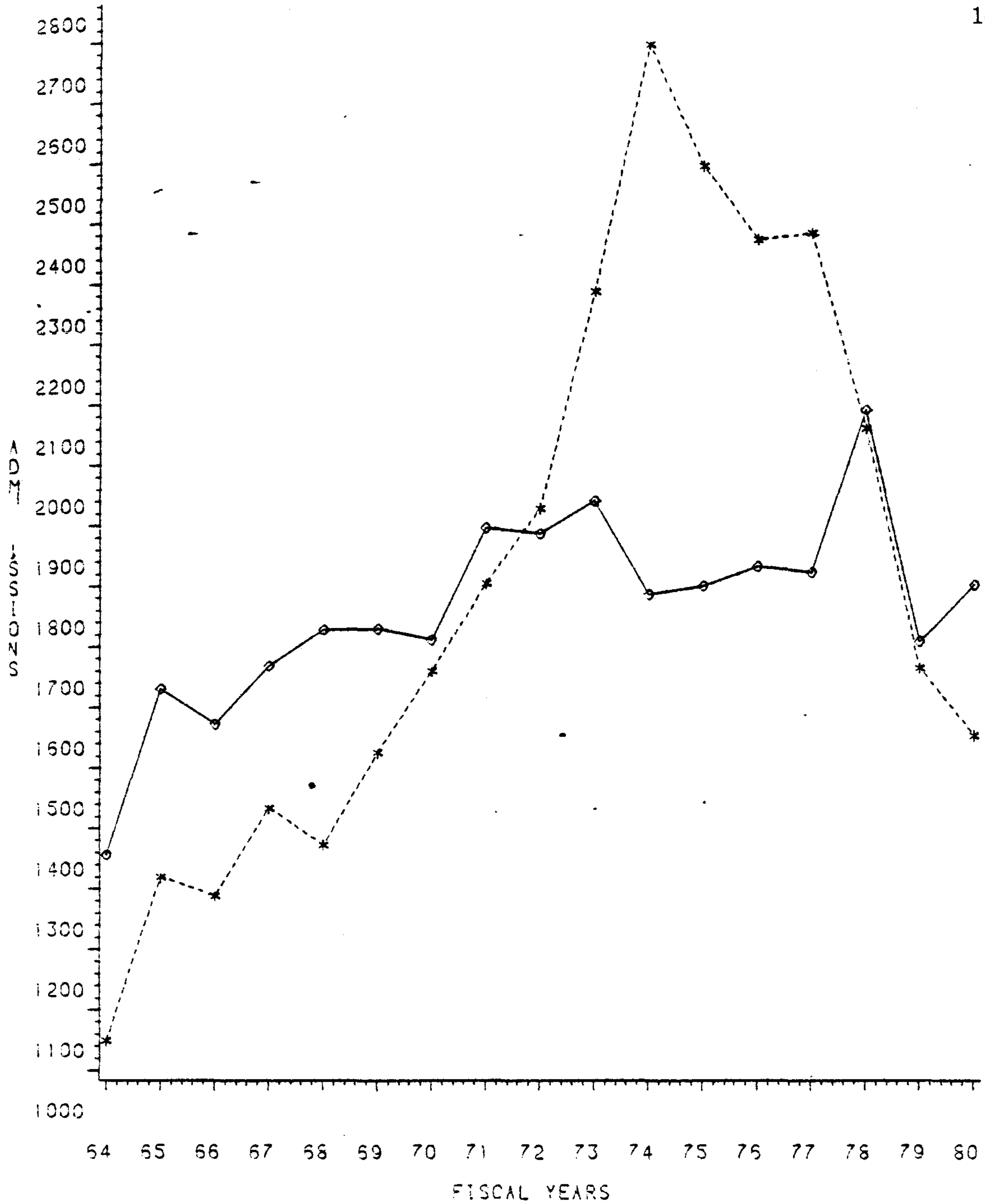
These data presented above suggest that hospital admissions have declined since FY 1974 for Kansas. CMHCs have served a large number of people, but the most common problems seen at the CMHCs are less severe than the problems or diagnoses commonly presented at the State Hospitals. The total number of persons served by CMHCs increased from slightly over 30,000 people in FY 1972 to almost 65,000 people in FY 1980 (Miami County CMHC opened in FY 1976 and Labette County CMHC opened in FY 1978). Also, the average number of outpatient sessions for comprehensive and non-comprehensive CMHCs suggest that the patients at CMHCs do not have long-term, continuing problems, or at least that

TABLE 2

First Admissions, Readmissions and Average Resident Population For Kansas State Mental Hospitals. Fiscal Years 1964 - 1980.

	First	Readmissions	Average Resident Population
1964	1,427	1,119	2,749
1965	1,700	1,389	2,581
1966	1,642	1,358	2,349
1967	1,738	1,503	2,313
1968	1,797	1,441	2,150
1969	1,798	1,594	1,906
1970	1,780	1,729	1,866
1971	1,965	1,873	1,701
1972	1,955	1,997	1,624
1973	2,010	2,356	1,550
1974	1,856	2,764	1,464
1975	1,870	2,562	1,311
1976	1,902	2,440	1,207
1977	1,892	2,451	1,118
1978	2,160	2,129	1,174
1979	1,778	1,733	1,135
1980	1,871	1,622	1,094

Source: Kansas Department of SRS, Fiscal Year 1980 Statistical Summary.



LEGEND ◊ First Admissions * Readmissions

FIGURE 2: First admissions and readmissions to Kansas State Mental Hospitals. Fiscal years 1964 - 1980.

any one episode of treatment does not involve much time on the part of CMHC staff members.

Profiles of State Hospital patients and CMHC patients may point out some of the differences between the clients at each type of mental health treatment facility. Over the last 10 years, the average admission age of State Hospital patients fell in the 25 - 34 year old range. Seven out of every 10 State Hospital admissions have been male and eight out of 10 have been Caucasian over the last five years (FY 1976 - FY 1980). The male/female population figures for the state were 49.0% male and 51.0% female, compared to 48.6% male and 51.4% female for the nation (U. S. Department of Commerce, May, 1981). The state's racial proportions were 91.7% white, 5.3% black, and 3.0% other, compared to the nationwide figures of 83.2% white; 11.7% black and 5.1% other (U. S. Department of Commerce, July 1981). The State Hospitals discharged a much higher percentage of non-whites (20% vs. 8.3%) than was reflected in the census. As mentioned, the most common diagnosis for State Hospital patients has been schizophrenia.

Patients discharged from CMHCs between FY 1976 and FY 1980 had a median admission age of between 25 and 34 years old. Almost one fourth of CMHC patients discharged in FY 1980 were of school age. Five out of every 10 FY 1980 discharges were male and nine out of 10 were Caucasian. The percentage of whites discharged from the CMHCs in FY 1980 matches the proportion of whites in the state, as reported in the 1980 census. As mentioned previously, the most common diagnoses for FY 1978 - FY 1980 were social maladjustments, adjustment reactions, transient situational disturbances, personality disorders and depressive neuroses.

If PACT were to accomplish the goal of serving people closer to their own homes and communities, then it seems certain that the CMHCs would have to accept and treat chronic patients with more severe diagnoses, such as schizophrenia or various psychoses. State Hospitals would also have to question whether they could justify continued operation, since their admissions would drop and average lengths of stay would get shorter. It is importent, therefore, to be able to distinguish between a hospital unit closing because of a deinstitutionalization policy and a unit closing because of the success of PACT.

Note that several units at various State Hospitals did close between FY 1974 and FY 1980, the time periods of interest in this study. It is important to be aware of historical changes, like these, and the exact times they took place so that their impact can be followed in the time-series. Knowledge of historical events is particularly important if the event coincides with the initiation of a new program, such as PACT. Closing a unit for other reasons could very well cause a decline in admissions and the researcher must be careful not to confuse the influence of a new policy with the success of a program.

Review of the Literature

In trying to make sense of mental hospital admission data, there has been a tendency to study admission data immediately prior to and immediately after a new CMHC is opened or a new program is started. Many administrators, for example, only examine information from the year before and the year after starting a new program, making judgements about whether the program worked from these data. If, however, there is a long-term increasing or decreasing trend in admissions (i.e., the admission data are not stable or stationary), this pre- and post-program observation method may be misleading. As an example, if State Hospital admission rates are increasing over time, studying admission data just before and just after a new program begins may show little or no change in admission rates as a result of the program's initiation. (No change in the admissions rate may be a positive finding if the rate previously had been rising rapidly.) A program may have officially started on a certain date but did not really reach its full operational state until one, two, or three months after the opening date. Observing admission rates immediately after the program started would preclude the researcher from discovering the program's effect if the effect was delayed. It would be better to study the admission data over a longer period of time in order to determine whether there was a trend in the data or whether there were delayed effects.

Several studies, which will be reviewed in more detail later, suggested that mental hospital admissions have been trending upward. If that is the case, then researchers should be aware of the rising trend and attempt to deal with it. A useful illustration of this trend is given by Redlich and Kellert (1978) in their sociological study of a small northeastern industrial region. Comparing 1975 mental health data with 1950 mental health data for the region, they found that the inpatient admission and readmission rates to the State Hospital had increased dramatically, almost 300%, with new admissions rising by 40% and readmissions by 650% (primarily due to alcoholic treatment admissions). Although it would have been better if they reported these rates for the intervening years, we do get an impression of the rising admission rates for that region.

The total regional population for the Redlich and Kellert study did rise over the 25 year period, but not substantially. The population was about 355,000 people, with a 12% minority population, in 1975. In 1950 the region had a population of about 275,000, with a 5% minority population. This means that the total population of the region grew by a little over 1% per year. Urban areas in the region accounted for over 60% of the population in 1950, but represented below 40% of the region's total population in 1975.

The average length of stay for a patient admitted to the region's State Hospital declined sharply from over 20 years in 1950 to 7 months in 1975, with many patients staying only 60 days. The resident patient census declined from almost 3,000 patients in 1950 to 1,000 patients in 1975. This decline is similar to the pattern of Kansas' average resident population, presented earlier in Table 1.

This combination of rising admissions, particularly readmissions, and the shorter lengths of time patients spend in the hospital (and, therefore, the lower resident populations) creates what is known as the "revolving door" phenomenon in State Hospitals. So, people admitted to this south central Connecticut region's State Hospital in 1950 were more likely to enter the hospital once and to stay there for two decades, than 1975 patients who were likely to enter the hospital more than once, but stay for a year or less. Mental health officials generaly view the "revolving door" as a negative result of deinstitutionalization, but it can be an improvement if it means that more patients are seen but are spending less time in institutions than in the past.

Mental health officials in Kansas argue that the State Hospital door is revolving because CMHCs are not taking the "tough" cases. CMHCs tend to serve patients with short term problems (e.g., the average number of CMHC outpatient sessions is between 7 and 8 per patient) and with less severe diagnoses than State Hospital patients. Table 3 compares diagnoses for CMHC and State Hospital patients discharged in FY 1980. Table 4 and Table 5 display the percentages of selected diagnoses in State Hospital and CMHC patients discharged between FY 1976 and FY 1979. State Hospitals are also more likely than CMHCs to serve non-farm laborers (21.11% vs. 8.18%) and the unemployed (37.00% vs. 13.47%). Students constitute the single largest group of CMHCs' patients (22.69%).

Even though CMHCs opened across the country between 1950 and 1975, two major studies by the National Institute of Mental Health (NIMH) claim that CMHCs have had little impact on State Hospital admission rates (Windle & Scully, 1976; Windle, Bass, & Taube, 1974).

TABLE 3

Comparison of CMHCs and State Hospital Patient Diagnoses

Diagnosis	State Mental Hospitals	Community M.H.C.
Mental Retardation	3.35%	2.90%
Organic Brain Syndrome (OBS)/Alcoholism	1.94	.38
OBS/Syphilis	.05	.06
OBS/Drug or Poisoning	.60	.11
OBS/Arteriosclerosis	.87	.18
OBS/Senile	.49	.27
OBS/Other	2.67	1.91
Schizophrenia	28.32	5.85
Major Affective Disorders	5.10	1.01
Paranoid States	.60	.13
Other Psychoses	.05	.08
Psychotic Depressive Reaction	1.23	.29
Depressive Neurosis	4.81	9.01
Other Neuroses	.98	3.82
Personality Disorders	10.98	9.43
Sexual Deviations	.08	.29
Alcohol Addiction	11.91	4.42
Other Alcoholism	14.99	5.95
Drug Dependence	3.57	2.38
Special Symptoms	.08	.60
Transient Situational Disturbances	1.12	10.75
Psychophysiological Disorders	.03	.41
Adjustment Reactions to Infancy, Childhood or Adolescence	3.22	11.87
Behavioral Disorders of Childhood, Adolescence	2.26	4.49
Social Maladjustment	.30	13.93
No Mental Disorders	.27	5.00
Undiagnosed	.03	4.48
Total N	3,669	31,342
Unknown/Not reported	15	3,499

Note: The percentages may not add to 100, due to rounding error.
Source: Kansas Department of SRS, FY 1980 Statistical Summary (p. 125).

TABLE 4

Selected Diagnoses of State Hospital Patients: FY 1976 - FY 1979

Diagnosis	State Mental Hospitals			
	FY76	FY77	FY78	FY79
Schizophrenia	29.71%	29.13%	28.06%	31.83%
Major Affective Disorders	-	2.91	4.09	4.91
Depressive Neuroses & Other Neuroses	6.36	7.20	6.76	6.20
Personality Disorders	11.82	7.22	8.71	8.47
Alcohol Addiction	20.25	30.55	29.73	26.17
Transient Situational Disturbances	4.26	.09	.71	1.05
Adjustment Reactions	-	2.31	3.47	2.94
Social Maladjustment	.14	.35	.24	.22
Total N	4,322	4,543	4,465	3,707
Unknown/ Not Reported	509	55	9	35

Source: Kansas Department of SRS, Fiscal Year 1976, 1977, 1978, 1979 Statistical Summaries.

TABLE 5

Selected Diagnoses of CMHC Patients: FY 1976 - FY 1979

Diagnosis	Community M.H.C.s			
	FY76	FY77	FY78	FY79
Schizophrenia	5.51%	6.00%	6.64%	6.20%
Major Affective Disorders	-	.90	.96	.83
Depressive Neuroses & Other Neuroses	11.08	11.91	14.32	14.10
Personality Disorders	8.02	8.52	10.50	9.92
Alcohol Addiction	7.87	7.89	8.15	8.82
Transient Situational Disturbances	19.66	.56	12.10	11.20
Adjustment Reactions	3.08	15.53	14.10	14.10
Social Maladjustment	9.70	11.56	14.60	14.31
Total N	30,612	28,640	24,951	29,924
Unknown/ Not Reported	696	1,093	7,240	4,978

Source: Kansas Department of SRS, Fiscal Year 1976, 1977, 1978, 1979 Statistical Summaries.

These studies, and others, investigating State Hospital admissions and CMHCs have not always made the best use of the data available to them. It may be, for example, that many new people are being treated by the CMHCs who were not being treated at all prior to the development of CMHCs (DeWolfe, personal communication, 1982).

Some efforts have come close to addressing the methodological problems inherent in studying data like State Hospital admissions, but in each case there are some difficulties. As examples of what has been done and how the studies have not been adequate, three sets of studies are reviewed here. The first set of studies deals with descriptive, typically pre-post observation studies. The second set of studies is more sophisticated, using inferential statistics to determine whether changes in admission rates are significant when pre- and post-program data are compared. The last set deals with time-series designs, which appear to be the most appropriate designs for these types of data.

Descriptive Studies

Among the first set of studies is McInnes, Palmer, and Downing's (1964) assessment of the effect of a new mental health center on State Hospital admission rates. San Mateo County, California witnessed a drop in its State Hospital's admission rates when the county's CMHC opened. Rates dropped from 144 admissions per 100,000 people in FY 1959 to 104 admissions per 100,000 people in FY 1962, while State Hospital admission rates rose for other counties in the San-Francisco - Oakland area during the same time period. There is no indication of how lasting this drop in admissions was since admission rates were only observed the year before and the year after the CMHC opened. No statistical tests of any kind were presented by McInnes et al.

Another study using only descriptive statistics is the Sundel, Rhodes, and Ferguson (1978) report on the impact of a newly established crisis unit on a psychiatric hospital's admission rates. This crisis unit operated in a way similar to the PACT program that is examined in the present study, although the circumstances were different. The control of one of Kentucky's State Hospitals was transferred to a community agency charged with providing comprehensive mental health services to four service, or catchment, areas in the Louisville metropolitan area. The idea was to establish a single system of services which would reduce the number of inappropriate hospital admissions and improve the quality and continuity of care. The Kansas PACT program has had similar aims, but has chosen to execute their program as a partnership between CMHCs and State Hospitals, rather than having the CMHCs take over the entire responsibility.

The Kentucky CMHC established a 20 bed crisis intervention unit to do preadmission screening -- a function assigned to the CMHCs in the Kansas PACT program. Using only those persons served in the crisis unit in a single month, the Kentucky CMHC did a one-shot case study of 83 patients. They gathered data on patient characteristics, diagnoses, referral sources, adequacy of support systems, and patient movement within the hospital and between the hospital and the community. Involuntary admissions constituted 29% of the group and 52% had at least one prior admission to the State Hospital. All data were presented as percentages and it was never made clear whether the crisis unit decreased the percent of persons admitted to the hospital.

A third study discussed the Vermont screening program, a program also designed to reduce State Hospital admissions (Taylor & Brooks, 1980). Vermont has only one State Hospital and 10 CMHCs. The State Hospital received two grants from NIMH, one of which supported the Rural Community Screening Program which began in October, 1974. The goal of this screening program was to reduce State Hospital admission rates from the three counties surrounding the State Hospital to the same level as the more remote counties. When the program began, admissions per 100,000 population for the largest of the three counties were more than double the rate for the rest of the state. The choice of these three counties was an obvious case of selection bias. One could expect that their admissions would decline because extreme scores tend to approach mean values (i.e., statistical regression). In this screening program, mental health workers went to traditional State Hospital referral agents such as ministers, law enforcement officers, and school officials to encourage them to refer clients to the CMHC first, rather than the State Hospital.

The program was not strictly confined to the three target counties because the program's admissions coordinator worked in the State Hospital's admissions office. The State Hospital's admission office encouraged other clinics in non-target counties to screen people and divert them to community resources whenever possible.

Yearly admissions dropped between FY 1974, the year before the screening program started, and FY 1977 from 1,122 to 632 patients. The program was successful, according to the authors, because the three county region had the same level of admission rates as the rest of the state. This may have been due, however, to a Hawthorne effect rather than to the effectiveness of the program. No other data from the years before or after the program began are reported.

Again, we have no idea what the pattern of admissions were for the target versus non-target counties. We also do not know if the effect of the screening program lasted for a long time. Did the admission rates for the non-target counties decline during the FY 1974 to FY 1977 period? The Taylor and Brooks (1980) study does not answer this question. We, once again, have a pre- and post-observation study, with little information about the non-target, control group of counties.

One descriptive study (Dyck, 1974) did use data from before and after a private psychiatric hospital and clinic converted to a CMHC. The same facility is discussed below by Kentsmith, Menninger, and Coyne (1975). The private hospital converted to a CMHC in 1963 - 1964. A NIMH five year demonstration project grant was awarded to Prairie View CMHC in 1964 to provide aftercare to patients returning to the community from Kansas' Topeka State Hospital. As a part of the project CMHC staff held monthly meetings with State Hospital staff to provide continuity of care for discharged patients. In addition, the CMHC staff actively sought referrals from the community, which Dyck claims changed referral patterns for the CMHC's catchment area. Patients were referred to the CMHC before going to the State Hospital and some patients were kept in the community as a result.

The period from 1960 to 1972 was studied to see how the use of Topeka State Hospital by catchment area residents compared with the use of the State Hospital by the rest of the state. Total admissions rose by 76% over the entire period, but admissions from the Prairie View catchment area dropped 38% during the same period. The most dramatic drop occurred when the demonstration project was started. Although Dyck used nothing more than percentages and graphs of admission rates in the study, he was able to show that Prairie View's history of admissions varied from the rest of the state's after the special program began. Because data were available for the time period before the program was initiated, the results are more convincing than those we find in the other descriptive studies.

Summary of Descriptive Studies. Descriptive studies of changes in mental health hospital admissions do not give us a clear picture of what actually occurred when CMHCs or special programs intended to reduce State Hospital admissions were started, except for Dyck's (1974) study. They only use information immediately prior to and after the change. This makes it impossible to judge whether the study period was dealing with data that were out of the ordinary, i.e., the admissions decline may have been part of a long term trend and not the result of a new program.

Problems With Studies Using Inferential Statistics

The second set of studies do use more sophisticated analytic means, but each of the studies has one or more of the following problems: 1) an insufficient number of data points to assess cyclical trends; 2) the use of post-intervention data only; and 3) not all counties are included in the studies. Each problem is discussed below.

Small Number of Time Points. Aanes and Tullos (1976) studied admissions to Minnesota State Hospitals, hypothesizing that counties with CMHCs would have lower admission rates than counties without CMHCs. Comparisons were made over three years -- 1970 to 1972. Although the use of three points in time was better than some of the studies mentioned above, three measurement points do not give a researcher a good idea of admission rate trends. During the three year period, State Hospital admissions for counties with CMHCs totaled 2,133, for an admission rate of 37.69 per 10,000 population. The 59 counties without CMHCs had 3,691 State Hospital admissions over the three year period, a rate of 39.32 per 10,000 population. A "test of proportions" revealed no significant differences between the two groups, but the "test" is not identified. Aanes and Tullos (1976) concluded that CMHCs have had no significant effect on the number of psychiatric admissions per 10,000 population to State Hospitals. The possiblility remains that the average length of stay or the number of different persons admitted to the State Hospitals was reduced. These would be positive outcomes for CMHCs.

Ozarin (1976), an NIMH official, takes issue with Aanes and Tullos' (1976) study, saying that other studies have found that the availability of CMHCs has reduced admissions to State Hospitals. Aanes replied that the findings of their study did hold, but that the study did not attempt to sort out other variables associated with admission. The study, in other words, could not reject alternative explanations. Part of the problem was that admission rates, aggregated over only three years, made it impossible to know whether State Hospital admission rates dropped prior to 1970 and leveled off in the 1970-1972 period.

Another study (Windle & Scully, 1976) collected at least five years of data on residents in and admissions to State Hospitals from 16 states. By using a non-equivalent control group design, they tested the success of the CMHCs' goal of reducing State Hospital use. Windle and Scully (1976) found no appreciable differences in the decline of State Hospital resident rates for either counties with or counties without centers. Again, the use of five measurement points may not have been sufficient to reveal a trend in the data.

Doidge and Rodgers (1976) used Mann-Whitney U tests to determine whether Wyoming's CMHCs reduced psychiatric admissions to the State Hospital. They used State Hospital admission data from 1972 in comparing counties with CMHCs, counties with clinics, and counties with no services. All counties were fairly well balanced on social indicators related to mental health problems and there had been no changes in State Hospital admission policy. Doidge and Rodgers hypothesized that counties without mental health services would have the highest admission rates, while those counties with the most comprehensive services would have the lowest admission rates.

The 23 Wyoming counties were divided into those with comprehensive CMHCs (nine counties), clinics (four counties), or no mental health services (ten counties). All differences were in the expected direction with the Mann-Whitney U tests significant at the .001 level. Doidge and Rodgers replicated the results of the study by using 1969 data. The Mann-Whitney Us were significant at the .05 level. Although the overall pattern of decline in State Hospital admissions was the same, there were significantly more State Hospital admissions in 1969 than in 1972.

Doidge and Rodgers (1976) then looked at the four counties that changed to a higher level of services between 1969 and 1972. Each county had a reduction in its admission rates (about 25%) to the State Hospitals, while the state's population rose 8%. No significance tests were performed. Doidge and Rodgers concluded that: 1) Counties with comprehensive mental health services had a significantly lower State Hospital admission rate than counties without comprehensive services; 2) When a county initiated or expanded its community mental health services, its State Hospital admission rate decreased; 3) Admission rates increased in counties without mental health services; and 4) CMHCs will reduce psychiatric hospitalization.

The Doidge and Rodgers study did not use enough data points to determine a pattern of State Hospital admission rates. Were State Hospital admissions on a decline for a long time before 1972 or 1969? Were the declines they discovered just part of a historical trend or were they due to the opening of CMHCs? Although they did have a comparison group, the data would have been better suited to the study if there had been more data points.

Another study in this set of inferential studies again examined the impact of new CMHCs on the use of State Hospitals and County Mental Hospitals (Siguel, 1974). Siguel tested four hypotheses: 1) that the development of CMHCs accelerated the decrease in the rate of resident patients; 2) that the development of CMHCs decreased the rate of admissions below what would have been expected otherwise; 3) that older CMHCs had a greater impact in terms of reducing the use of State and County Mental Hospitals when CMHC size was held constant; and 4) that more reductions in the use of State and County Mental Hospitals would occur as more CMHCs became operational and the existing CMHCs became older. These hypotheses were tested using a multivariate step-wise regression of 1970 and 1971 data from the 48 contiguous states. Another approach would have been to cross-validate the data.

The dependent variables, use of State and County Mental Hospitals, included admission rates. The independent variables were measures of the development of the CMHCs, such as budgets, staff hours, and so forth. As with most of the studies discussed in this review, the data were obtained from existing records. Siguel concluded that CMHCs did reduce State Hospital and County Hospital use. Another major finding was that a higher number of CMHCs per capita was associated with lower admission rates. Also, having newer CMHCs or larger expenditures for CMHCs was associated with lower admission rates. DeWolfe (personal communication, 1981) has suggested that this collection of findings may more parsimoniously reflect favorable local attitudes, in general, toward the treatment of the mentally ill. Again, trends could not be assessed in this stüdy since only two time points were used.

A study done in Kansas was the only one to use more than five data points. Kentsmith, Menninger, and Coyne (1975) examined all admissions to one Kansas State Hospital from a rural, three county catchment area. During the period of FY 1961 to FY 1971, a private Mennonite psychiatric hospital and clinic became the Prairie View CMHC (in 1964). The purpose of the Kentsmith et al. study was to assess the CMHC's impact on the Topeka State Hospital's admission rates. All admissions to Topeka State Hospital from Marion, McPherson, and Harvey counties from July 1, 1960 to June 30, 1971 were identified and summarized into yearly data. Although 132 data points were available to the authors (11 years X 12 months = 132 months or data points), they collapsed these data into yearly sums so that there are only 11 data points.

Comparisons were made between direct admissions to Topeka State Hospital from the Prairie View CMHC catchment area and admissions to Topeka State Hospital that were referred from Prairie View, and between each of these and the expected rate of admission to the State Hospital. The expected admission rate was determined by averaging all admissions to the State Hospital from its entire 30 county catchment area. The decrease in admissions from the three county area was significant, both over the 11 year period and when the period after FY 1964 was compared with the period before FY 1964. A chi-square statistic was used to test these comparisons.

The referral pattern from the CMHC did not change after FY 1964, i.e., it seems to be a stationary pattern. Direct admissions do show a decline in level after FY 1964, while admissions from the State Hospital's entire catchment area showed a regular, stationary pattern until FY 1971, where there was a sharp increase in admissions. Although the chi-square analyses support the data, a time-series design and analysis would have made better use of the data available to the researchers, as will be explained in Chapter 3.

Post-Intervention Data Only. Aanes and Tullos (1976) were among the researchers to use post-intervention only data in their studies. The three years they examined - 1970 to 1972 - appear to have been a time when CMHCs were already established in some counties and not yet established in other counties. There is no opportunity to examine admission rates before CMHCs were established in some or all of the counties. A drop in State Hospital admissions might have occurred before 1970 as CMHCs opened in various counties. We have no way of knowing if this occurred.

A similar problem was present in an Alabama study. Decker and Shealy (1973) compared State Hospital admission rates from Alabama counties with and without CMHCs. Recognizing the need for longitudinal, rather than cross-sectional studies, they examined the relationship between the existence of CMHCs and admission rates to State Hospitals for a seven year period. Alabama's 67 counties were divided into two groups, those with CMHCs and those without CMHCs. The mean State Hospital admission rates were calculated for all counties with and without

LEWIS TOWERS LOYOLA

clinics for the seven year period according to white, black, and total populations. The mean admission rates of each year, total and both race populations for counties with and without CMHCs were compared using *t*-tests. Counties with CMHCs had significantly lower admission rates than counties without CMHCs for 1962 to 1966 and 1968. Similar differences for the white population were found in 1962 and 1964 to 1968, but no significant differences in State Hospital admission rates were found for the Negro population. Decker and Shealy also found that counties with CMHCs had significantly higher per capita incomes than counties without CMHCs.

It is difficult to say whether the differences in admission rates that Decker and Shealy (1973) found were due to the CMHC - no CMHC distinction or whether the differences were due to the fact that counties with CMHCs were wealthier than counties without CMHCs. Since there were no admission data available for the period before the CMHCs were opened, we do not know if these wealthier counties always had lower admission rates than the poorer counties. The pre-intervention, or pre-CMHC, data would help us to answer this question.

Excluded Counties. Two studies excluded certain counties from their study. Aanes and Tullos (1976) included only 75 of Minnesota's 85 counties in their study. The other ten counties were excluded because they were either metropolitan counties, counties with a CMHC and a State Hospital, or counties in which a State Hospital was located. Counties with State Hospitals were excluded because the researchers believed proximity to State Hospitals would be related to above average admission rates.

As mentioned before, Aanes and Tullos found no significant differences in State Hospital admissions between counties with CMHCs and counties without CMHCs. Even when the counties in which State Hospitals were located were included in the group of counties without CMHCs, there were no significant differences found. The urban counties were never included in the study. An obvious question remains: If the urban counties were included in the study and pre-CMHC data were available, would there have been significant differences between counties with CMHCs and counties without CMHCs?

Windle and Scully (1976) included counties either wholly within or outside CMHC catchment areas. This means that highly urbanized areas were excluded from this study as well, since urbanized areas often had more than one catchment area. Counties were grouped by Windle and Scully according to what year their CMHC opened.

Windle and Scully (1976) found no appreciable differences in the decline of State Hospital resident rates for either counties with or counties without CMHCs, as mentioned above. Analyses of admission data showed no clear differences when individual states were examined longitudinally. Comparisons of groups of counties in which CMHCs opened at the same time showed a slightly smaller increase in admission rates for areas with centers, but this difference was not reliable. Reliable differences in admission rates were found by means of a chi-square test. These comparisons were significant only when comparisons of admissions were performed on groups of counties that came from the same state and were served by CMHCs that opened in the same year. Windle and Scully concluded that CMHCs have not reduced resident rates in State Hospitals, but that CMHCs appear to have slowed or slightly decreased State Hospital admissions.

Summary of Studies Using Inferential Statistics

Apart from the Kentsmith, Menninger, and Coyne (1975) study, the studies that have been described in this section were lacking in a number of ways. Most of the studies, for example, use only one or two years of data, making it difficult to determine if the effects they discovered were spurious or were true changes in State Hospital admission rates. No data were available for the period preceding a new program or the opening of a new CMHC in two of the studies. Thus, it was possible that the groups with the program or CMHC and the groups without the program or CMHC were different to begin with for some other reason besides having or not having the program or CMHC. Finally, some of the studies excluded certain counties because they were urban or because they were in close proximity to a State Hospital.

Kentsmith et al. (1975) did use data from time points before and after a CMHC was established in a three county catchment area. Unfortunately, they aggregated the data on a yearly basis so that only 11 data points were available. By using monthly data, a time-series design and analysis could have been used. This would have allowed them to model the effect that the Prairie View CMHC had on Topeka State Hospital's admissions from the three county catchment area. This, in addition, would have made it possible for the researchers to forecast future State

Hospital admissions from the Prairie View catchment area.

Time-Series Studies

The third set of studies of interest here employed time-series designs with varying degrees of success. Time-series designs generally employ one set of observations on one or more variables over a number of time points, e.g.,. days, months, quarters, years, (Ostrom, 1978). All of the studies reviewed here used "interrupted" time-series, in which the series of observations was interrupted by a treatment or intervention, such as the opening of a CMHC, a policy change, or the beginning of a new program.

Billings (1978) discussed the same three county Vermont screening program as Taylor and Brooks (1980), but Billings used a time-series design in which the target counties were compared with all the other counties in the state. Cook and Campbell (1979) have called this an "interrupted time-series with a nonequivalent no-treatment control group time-series" (p. 214). Eleven quarters of data were analyzed for the three counties with CMHC screening and the control group of counties with Hospital screening. State Hospital admissions were compared prior to the program and during the first one and a half years the program was in effect. The numbers of admissions per 100,000 population during the pre-screening program period were compared with admission rates after the program began.

Total admissions were divided into voluntary and involuntary, and first admissions and readmissions to determine which type of admission had been affected by the screening program. Billings found that there were significant reductions in total admissions in both groups of counties, those with CMHC screening and those with Hospital screening. The CMHC screening produced larger declines, but the three counties involved were also the counties with the highest admission rates in the state. Voluntary admissions and first admissions declined significantly for both groups, while readmissions declined significantly only for the CMHC-screened counties.

Billings used a *t*-test with an alpha level of .01 to simultaneously assess changes in the slope and the level of both time-series. Gottman and Glass (1978), point out that time-series are usually autocorrelated, which means that the present value in a series is related, to some extent, to past values in the series. If the data are in fact autocorrelated, then the results of a *t*-test on the unmodeled data would lead to erroneous conclusions. Type I error (concluding that a relationship exists when it does not) is underestimated for positive autocorrelation and overestimated for negative autocorrelation when the sample is large. Similar problems occur when the sample is small.

Billings did not choose the correct alpha level for the number of comparisons he had to make. Cook and Campbell (1979) suggested that when multiple comparisons are made the researcher should take the desired alpha level and divide it by the number of possible comparisons to get the appropriate alpha level. If this is true, and if Billings was interested in an actual alpha level of .05, then he would be restricted to five comparisons in using the .01 alpha level *t*- values. Alternatively, Billings could have cross-validated the data.

Delaney, Seidman, and Willis (1978) used an interrupted time-series design with a "matched nonequivalent control community" (p. 33) to assess whether a crisis intervention program in CMHCs reduced State Hospital admissions of persons 18 and older. The "matched" area was subject to the same changes in public policy and leadership, had a state university, no major industry, and was largely agricultural as was the target area. The "matched" area, however, did not have a crisis intervention program aimed at preventing institutionalization.

Delaney et al. reported a significant increase in admissions in the first quarter following the initiation of the program, but a significant decline after that quarter. The matched control group had no significant decline in Hospital admissions. A *t*-test was used to assess changes in slope and level using an alpha level of .05. (The problem with using a *t*-test with unmodeled time-series data has been discussed above.)

In addition to examining State Hospital admissions, inpatient CMHC admissions were analyzed using the same design and the *t*-test. The same results were obtained for CMHC admissions as for State Hospital admissions. In both analyses only 16 data points were available for statistical analysis.

Gallagher (1976) used a time-series design to assess a CMHC's impact on a community in southwestern Michigan. Gallagher's abstract does not clearly indicate it, but it appears that his study is an interrupted time-series design with switching replications. "Switching replications" refers to the situation where one group receives the treatment and at some time later the other groups also receive the treatment. Each group acts as a control for the others because of the staggered applicatiōn of the treatment. This makes history a less plausible alternative explanation. Gallagher used 25 years of data on indicators of violent behavior (suicide rate, homicide rate, and child abuse rate) and State Hospital use (first admissions, average length of stay, and annual patient turnover percentage). Data from seven counties were used.

One problem of Gallagher's study was that all of the counties had a history of mental health services; there was no clear comparison of counties with and without mental health programs. Another problem was that the homicide rate had little relevance to mental health programs and was not sensitive to change. Also, child abuse rates did not accurately reflect actual child abuse in each county. Finally, suicide, homicide, child abuse, and first admission rates were unstable, making program impact difficult to detect.

Only three of the seven counties showed any program impact. The Cass County program was related to reduced State Hospital first admissions, while the Ottawa program was related to an increase in the turnover of State Hospital patients. The Van Buren County program was related to a decrease in the first year length of stay in the State Hospital and to an increase in child abuse reporting (a possible instrumentation effect). It is difficult to make sense of these findings since they are not consistent across all counties. In addition, Gallagher (1976) never mentions how these relationships were tested.

The authors of another time-series study admitted that they did not have enough data to do a time-series analysis and did not even attempt it (Shaeffer, Schulberg, & Board, 1978). This study evaluated the impact of CMHCs on State Hospital admissions using a time-series with switching replications. Shaeffer et al. gathered data on total inpatient admissions to one of Pennsylvania's State Hospitals from two counties (Lawrence and Beaver counties). Data were gathered for points 10 years (FY 1966, FY 1969 - FY 1977 yearly data) before and after a CMHC began in each area. Beaver County's CMHC opened in 1970 and Lawrence County's services were expanded in 1973. Data were also obtained on patient demographics and clinical characteristics. Shaeffer et al. argued that overall admission rates were not an adequate criterion, since centers may have been affecting the type of patient admitted to State Hospitals without dramatically lowering the total admission rates.

Shaeffer et al. appropriately discarded the idea of using the ordinary least-squares method and a test based on what is called a moving average model. Ordinary least-squares is inappropriate because points close to each other in a series are more highly correlated with each other than points further away from each other in the series. Shaeffer, et al. did not use the moving average model either because a minimum of 50 data points are recommended for estimating the moving average model.

Shaeffer et al. concluded that State Hospital admission patterns for patient subgroups were not affected by expanded CMHC services. No consistent differences were found between the groups on the demographic factors of race, sex, level of education, employment status, marital status and age. Three clinical factors, however, did consistently differ between the two counties: percentage of persons with previous hospitalizations, the facility the person was previously hospitalized in, and diagnosis. Lawrence County had a greater proportion of admissions with previous hospitalizations in 9 out of 10 years, a greater proportion of readmissions who had been hospitalized at Dixmont State Hospital in 8 out of 10 years, and more admissions with diagnoses of schizophrenia (8 out of 10 years) and neurosis (all 10 years). Beaver County admissions more frequently received diagnoses of organic brain syndrome and organic brain syndrome related psychoses. These differences, however, cannot be attributed to expanded CMHC services since they were consistent throughout the time-series.

"Eyeballing" the data, Shaeffer et al. suggested that the opening of a CMHC in each county reduced State Hospital admission rates for that county. The data also suggested that CMHCs were associated with shorter lengths of stay in the State Hospital. If the authors had been able to use monthly, instead of yearly data, they would have been able to fit a model to the data and statistically test their hypotheses.

The last time-series study considered here also used a switching replications design and is the only study with enough data points (106 months) to do statistical modeling (Spearly, 1980). Only five Texas CMHCs were investigated, however, and their method of selection very probably made them uniquely different from other Texas CMHCs. One center's area was split to provide a comparison between the period June, 1970 to August, 1974 when it served only two counties, and September, 1974 to March, 1979 when it began to serve three more counties. Each CMHC was served by a different State Hospital. First admissions and readmissions were examined, as well as monthly data on Hospital discharges to each CMHC's catchment area. Discharges were examined to determine whether there were any substantial increases or decreases just prior to a CMHC's opening.

Aware of the problems of traditional statistics with time-series data, Spearly (1980) used the Auto-Regressive Integrated Moving Averages (ARIMA) modeling method, which describes the data and adjusts for autocorrelation. A t-test was used on the adjusted data to test the intervention effects. Only two of the six areas showed a significantly abrupt and permanent change in the level of first admissions to State Hospitals coinciding with the initiation of CMHC services. Two centers' areas had significant abrupt, permanent change in the level of readmissions to State Hospitals coinciding with the opening of CMHCs. No significant changes in slope coinciding with the initiation of center services were observed for either first admissions or readmissions in any of the CMHC areas. A visual inspection of plotted discharge data for each area indicated no evidence of significant increases or decreases in State Hospital discharges.

Spearly (1980) concludes that the centers had a negligible impact on State Hospital admissions. Only one center was effective in reducing the level of first admissions and readmissions from its catchment area. Another center was successful in reducing first admissions from the area to which it expanded its services in 1974. The lack of consistent results could be related to differences among the five centers studied.

Summary of Studies Using Time-Series Designs

The time-series studies discussed above, with the exception of Spearly (1980) and possibly Gallagher (1976), did not include enough data points (50) to be able to model the data and, therefore, their statistical tests were inappropriately applied to the data. Gallagher (1976) never identified how his data were analyzed and whether the data were yearly or monthly. Shaeffer, Schulberg and Board (1978) did not have enough data points in their study and correctly limited themselves to a visual inspection of the plotted data.

All of the studies suffered from a bias in the selection of sampling units. Billings' (1978) study focused on three Vermont counties that had the highest State Hospital admission rates in the state. Delaney, Seidman, and Willis (1978) used two university towns and their surrounding areas in rural Illinois as the objects of their study. Gallagher (1976) selected seven counties in southwestern Michigan but no clear explanation for their selection was provided. Shaeffer, Schulberg and Board (1978) used data from only two Pennsylvania counties in their study. Finally, Spearly's (1980) five CMHC catchment areas were selected because they had sufficient pre-intervention data points, no major reorganization of services (except for one CMHC included in the study), and no State Hospital outreach centers serving the area. It would have been beneficial to compare these five CMHCs to the rest of Texas to see if the selection criteria were justified.

The Present Study Versus The Previous Studies

CMHCs or screening programs did appear to reduce State Hospital admissions in the majority of the studies reviewed above. Eight studies claimed a significant reduction in admissions, four found no significant differences in admissions, and one study (Sundel, Rhodes & Ferguson, 1978) did not report whether State Hospital admissions were reduced. Typically, the use of State Hospitals' decreases when a CMHC opens or a screening program begins as compared to an area that does not have a CMHC or a special screening program. As mentioned in the above section, however, most of the studies have one or more methodological or statistical flaws.

The present study is different from these previous studies in a number of ways. First, the present study has a sufficient number of data points to statistically model the data, take historical trends into account and test the hypotheses appropriately. Only the Spearly (1980) study met this condition. Monthly data from July, 1973 to June, 1980, yielding 84 data points, are used in the present study.

Second, the present study included all Kansas CMHCs, making the study broad based and avoiding the selection problem faced by Spearly and the other researchers. All State Hospital admissions in Kansas were analyzed, encompassing all counties, all CMHC catchment areas, and all State Hospitals.

Third, because a large number of data points are used and because the switching replications design is used, historical trends in admission rates can be assessed and accounted for in the present study.

Pre-intervention data for each group of CMHCs acted as controls for the other groups.

Fourth, some studies limited themselves to analyzing total admissions. The present study examined first admissions and readmissions. In addition, the study examined first admissions and readmissions for two other populations -- alcoholics and adjudicated youths -- which were excluded from the screening program, but were admitted to the State Hospitals from all Kansas counties.

This study also includes a careful discussion of the data, the data sources, the problems of validity associated with the data, and how the assumptions made in using these data impact on the validity of the results.

Although no one study can provide a final answer, the present study used state-of-the-art methods to assess whether a community-based screening program did reduce State Hospital admissions appreciably and to determine what effect pattern was present -- abrupt or gradual change, permanent or temporary.

Objectives of This Study

The purpose of this investigation is to assess whether a CMHC-based screening program had a significant impact on admissions to Kansas' public mental hospitals, by using a time-series design. Catchment areas with the screening program are compared to catchment areas that joined the program later and to areas that had not joined the screening program by June, 1980. A time-series design and analyses provided the most appropriate way to examine the data and compare the various groups.

Hypotheses

The present study tested the following hypotheses:

1) Did the community mental health screening program, known as PACT, significantly reduce first time admissions to Kansas State Mental Hospitals? Specifically, an ARIMA model was fitted to the data. Once a model was satisfactorily fitted to the data an intervention component was be added to the model. The intervention component was tested with a t-test to see if it was significant. An explanation of ARIMA models and the reasons they are preferred are presented in Chapter 3.

2) If community mental health centers (CMHCs) are to not only prevent people from being admitted to mental hospitals, but to treat and keep patients in the community once they are released from a mental hospital, then PACT should have significantly reduced readmissions to Kansas State Mental Hospitals. Again, an ARIMA model was fitted to the data and a t test was used to test the intervention component.

3) If the PACT program alone is responsible for a reduction in the level of first admissions and readmissions to Kansas State Mental Hospitals, then admissions and readmissions for non-PACT patients should not be affected.

Drug, alcohol, and Youth Rehabilitation Center patients were excluded from the PACT program. Where the data are available, they should show no significant reductions in admissions that parallel reductions for PACT patients. In other words, non-PACT patients should not have any reductions in their admission and readmission rates that coincide with the initiation of PACT in the different CMHC catchment areas. The intervention component should not be significant for any of the drug, alcohol, and YRC admissions.

CHAPTER II

METHOD

The nature of the sampling units, how the units were combined to form the three groups, how the data were collected, and the problems inherent in the data are discussed in this chapter. In addition, the multiple group time-series design with switching replications is described and its strengths and weaknesses are identified.

The Sampling Units

The basic sampling unit in this study was the Kansas county. Each of the 105 Kansas counties was grouped into a CMHC catchment, or service, area. Some areas consisted of only one county and others had more than ten counties within their bounds. Shawnee County, for example, was the only county in Catchment Area 9 and was served by two CMHCs. This was true of the other major urban counties in Kansas - Douglas (Lawrence), Johnson (Olathe, Overland Park), Sedgwick (Wichita), and Wyandotte (Kansas City) - which are one-county catchment areas, each served by one or more CMHC facilities.

In contrast, one CMHC, High Plains, serves all 20 sparsely populated counties of northwest Kansas (Catchment Area 1). The data for multiple county catchment areas, such as Catchment Area 1, were collapsed across counties for each data point (month). All catchment areas were combined into three groups, according to when their CMHCs joined the PACT screening program. The CMHCs in Group One joined the program on October 1, 1978.- The CMHCs in Group Two joined the program one year later on October 1, 1979; while the CMHCs in Group Three did not join the PACT screening program during the time period covered in this study. Table 6 lists the three groups of counties. Figure 3 depicts the county groupings on the Kansas map.

Group One contained 45 counties and accounted for a total population of 1,109,990 people,according to the 1980 census (U.S. Department of Commerce, March 1981). This was 46.96% of the total Kansas population, which was 2,363,679. Group Two included 42 counties and 937,269 people, or 39.65% of the state's total population. Group Three had 18 counties and 13.39% of the state's total population (316,420 people). The state's overall urban population was 66.7% of the total population. The only Kansas counties that are in Standard Metropolitan Statistical Areas (SMSAs) are Butler, Douglas, Jefferson, Johnson, Osage, Sedgwick, Shawnee, and Wyandotte counties. The urban proportion of the population in Group One was 70.62%. Group Two had 62.41% of its population classified as urban, while Group Three had an urban population of 65.45% (U. S. Department of Commerce, December 1981). The overall urban proportion of the State's population was 66.70%. It is important to note that the population of Kansas was relatively constant between 1970 and 1980, increasing only 5.1% during this period.

Because the Kansas CMHC catchment areas are not overlapping, it was fairly easy to divide the areas and, therefore, the counties into

TABLE 6

List of County Groups

Group One

Allen, Anderson, Atchison, Bourbon, Cheyenne, Clark
Clay, Cloud, Comanche, Decatur, Edwards, Ellis,
Geary, Gove, Graham, Jefferson, Jewell, Johnson,
Kiowa, Leavenworth, Linn, Logan, Marshall, Mitchell,
Neosho, Ness, Norton, Osborne, Phillips, Pottawatomie,
Rawlins, Republic, Riley, Rooks, Rush, Russell,
Sedgwick, Sheridan, Sherman, Smith, Thomas, Trego,
Wallace, Washington, and Woodson.

Group Two

Barber, Barton, Brown, Butler, Chase, Chautauqua,
Cherokee, Coffey, Cowley, Crawford, Dickinson,
Doniphan, Douglas, Elk, Ellsworth, Greenwood,
Harper, Harvey, Haskell, Jackson, Kingman, Lincoln,
Lyon, Marion, McPherson, Meade, Montgomery, Morris,
Nemaha, Osage, Ottawa, Pawnee, Pratt, Reno, Rice,
Saline, Seward, Stafford, Sumner, Waubaunsee,
Wilson and Wyandotte.

Group Three

Finney, Ford, Franklin, Grant, Gray, Greeley,
Hamilton, Hodgeman, Kearny, Labette, Lane, Miami,
Morton, Scott, Shawnee, Stanton, Stevens and Wichita.

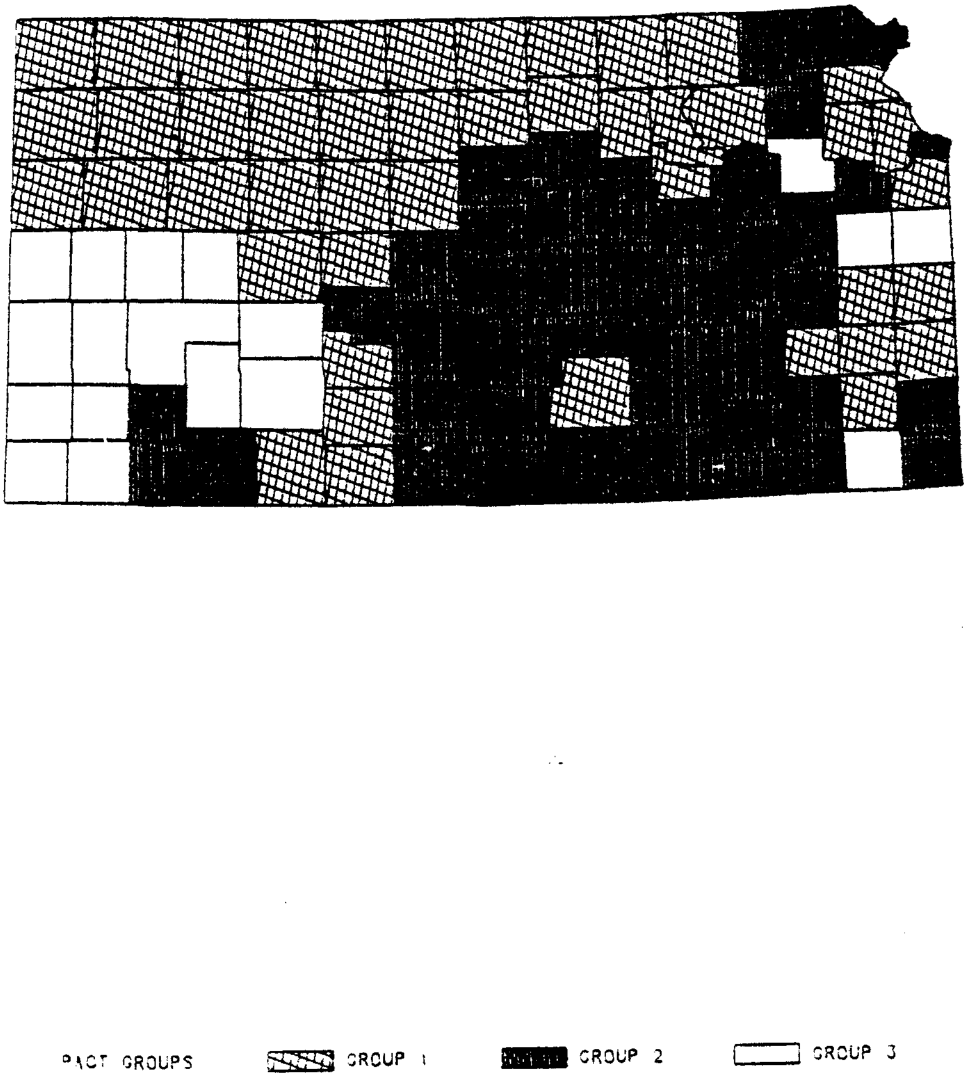


FIGURE 3: PACT county groups.

the three groups. Two counties, Miami and Labette, did not have CMHCs for the entire period of the study, as mentioned in the first chapter. It is likely that their residents were seen in other CMHCs in southeastern Kansas before each of the CMHCs in Miami and Labette counties was established. All admissions from these two counties were categorized as admissions from non-participating counties (Group Three).

Data Collection

Time series designs, including the switching replications design, call for longitudinal data over at least 50 time periods if sophisticated statistical analyses are used (Box & Jenkins, 1976). The data in this study were monthly admissions to the three Kansas State Mental Hospitals gathered from state archival records for Fiscal Year 1974 through Fiscal Year 1980. These data were reported by State Hospital admissions staff to the Department of Social and Rehabilitation Services (SRS), Research and Statistics Office. There the data were checked and corrected if necessary. The researcher requested crosstabulations of all mental health admissions by county of residence, by admission month, by admission status for each Fiscal Year, 1974 through 1980, from SRS.

Note that the mental health admissions data include first admissions, readmissions to the same hospital, admissions of persons previously in another state hospital, and admissions of persons previously in another mental health institution. Admissions transferring from one State Hospital to another were not included. Including transfer admissions could have resulted in a duplicate count of admissions.

Alcohol, Drug and Youth Rehabilitation Center (YRC) admissions were excluded from the other State Hospital admissions, since these patients were not involved in the PACT screening program. These non-PACT admission groups were used as comparisons for the PACT admissions. Alcohol and drug abuse patients were excluded from the screening program because they were thought to enter treatment frequently, but stay a very short time and, therefore, would require a large proportion of the screening resources and generate an unmanageable amount of paperwork. YRC admissions were separated from regular mental health admissions because the patients were committed to the YRCs by the court system, meaning that the CMHC system had little control over keeping these youths in the community.

Problems With the Data

One problem was how to classify the admissions data from Labette and Miami counties. As mentioned above, it was impossible to determine if Labette and Miami County residents were served in other CMHCs before their own CMHCs opened. Admissions from these counties were included in Group Three (the non-PACT counties) both before and after the Labette and Miami County CMHCs opened. The two counties never joined the PACT program.

Each Fiscal Year was missing data. Table 7 documents the number of missing cases for each year and patient type - mental health, alcohol and drug, and YRC. A missing case was one in which the admission month or admission type (first or readmission) was not available. The number of missing cases in FY 1976 represented 9.1% of the mental health cases

TABLE 7

Number of Missing Cases for Admissions Data

	Mental Health	Alcohol & Drug	YRCs & Youth Centers
FY 74	14	0	5
FY 75	18	5	1
FY 76	401	114	0
FY 77	2	7	0
FY 78	4	2	0
FY 79	6	7	2
FY 80	6	5	2

for that year and 9.0% of the alcohol and drug cases for the year. The number of missing cases for YRCs in FY 1974 represented 1.1% of the total number of cases. All other categories in other years had less than 1.0% of their total number of cases missing.

Only YRC admissions were included in this study, but the number of missing cases and their percentages refer to total YRC and Youth Center admissions. There are three Kansas Youth Centers and none of them are located on State Hospital grounds. The Youth Centers are juvenile correctional facilities and, although each one has a psychologist and a psychiatrist on staff, the focus of the Youth Centers is on containment and correction rather than on mental health treatment. The number of missing cases for YRCs, then, was probably lower than the numbers displayed in Table 7.

Another problem with the data was that "county of residence" is often a poor indicator of the patient's original residence, before institutional treatment began. Often, especially with persons discharged from the State Hospitals, there is a tendency for the former patients to remain in the county in which the State Hospital is located. This distorts the picture of what counties were originally responsible for the patients, if the people are readmitted to the State Hospital.

The Multiple Group Time Series Design With Switching Replications

The purpose of this section is to review the characteristics of the time-series design. Strengths and weaknesses of the design are discussed in terms of Cook and Campbell's (1979) four types of validity - internal validity, external validity, construct validity, and statistical conclusion validity.

A time-series is a set of observations on one or more variables for the same people (unit-repetitive) or the same administrative/political unit (unit-replicative) over a number of time points (Glass, Willson, & Gottman, 1975). This study was unit-replicative rather than unit-repetitive; that is, admissions data from counties were observed for each of 84 successive months, rather than observing the number of times an individual was admitted to a State Hospital over 84 months. In a time series the interval between observations should be equal and constant (Ostrom, 1978) as it was in this study. Admissions data for each calendar month were reported by the State Hospitals to the Department of Social and Rehabilitation Services' (SRS) Research and Statistics office. Data for time-series also should be at least interval level data (McCain & McCleary, 1980). This study's admissions data met this criterion.

The Simple Time Series

Social scientists are usually interested in the "interrupted" time series. The series is "interrupted" by a treatment or an intervention. Cook and Campbell (1979) illustrate the simple interrupted time-series as follows:

O O O O X O O O O

where O is an observation and X is the intervention. Ideally, the interruption occurs in the middle of the series, although that was not the case in this study.

Interrupted time-series designs include the following elements: 1) quantitative measures; 2) taken of a single unit; 3) repeated at regular intervals over a long period of time, along with; 4) some record of historical events, which may be specific knowledge of when a certain intervention took place (Knapp, 1977). The individual unit acts as its own control because of the large number of observations. More control is possible by comparing one unit's time-series with a comparable time-series. If an intervention is successful in causing a change there should be an interruption in the sequence of observations. Figure 4 gives an example of a single interrupted time-series in which the intervention had an obvious effect. In this example there is a change in the level, but not the slope of the series after the intervention.

Advantages of Time Series

The objective of analyzing an interrupted time-series is to determine whether the treatment had any effect on the post-intervention series. Time series designs are useful for describing the data, especially if the data have cyclical or seasonal trends or there is a lag between the time an intervention is initiated and an effect occurs. They can be used with archival data, as in this study, or with data from a planned experiment. Time series designs are suitable for single subject research (Kratochwill, 1978), such as monitoring the behavior of a client for change in a behavior modification program or for collective units, such as the counties of this study.

Some of the advantages of using time-series designs are that: 1) they can help the researcher to formulate hypotheses about the data;

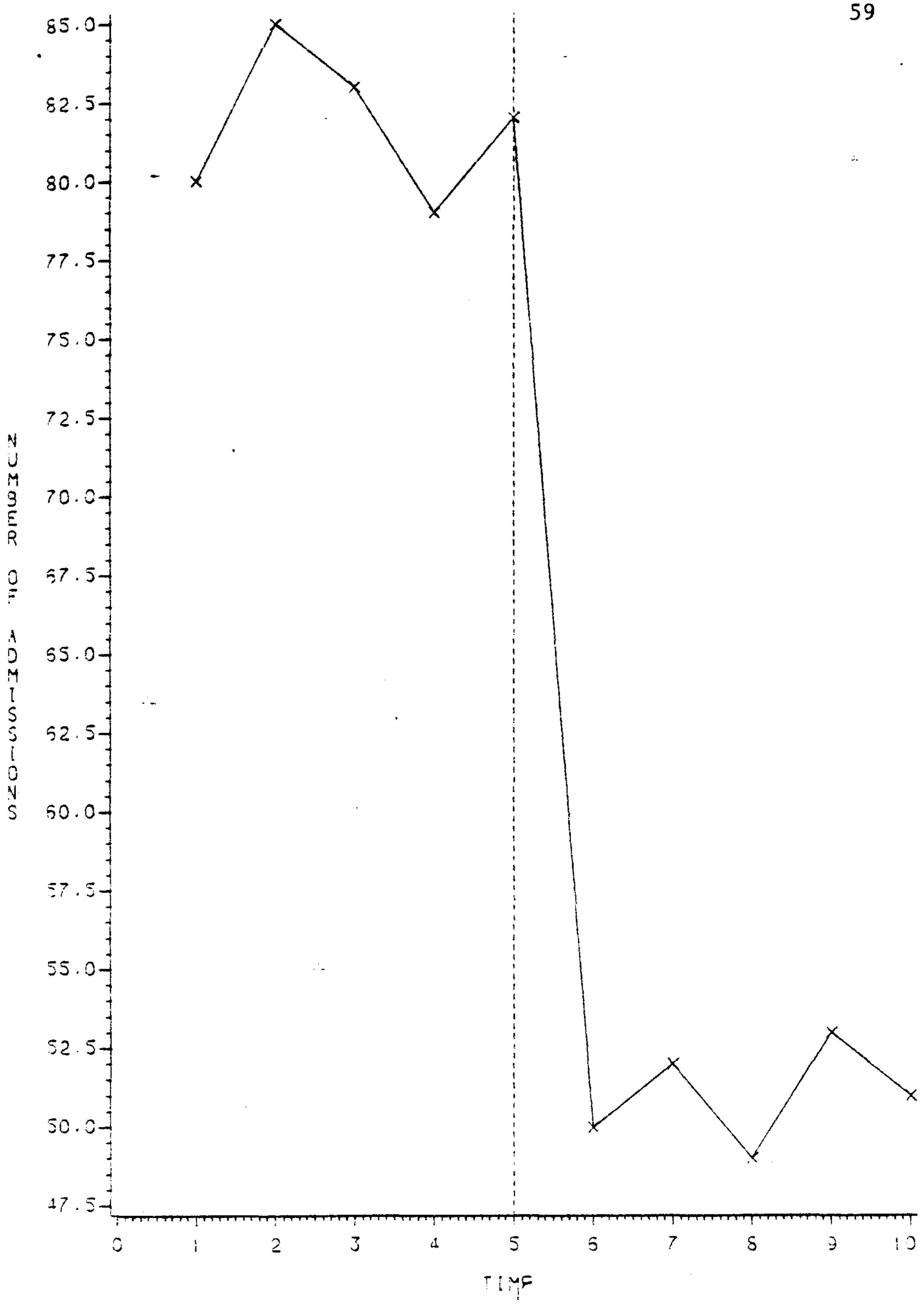


FIGURE 4: A simple interrupted time-series.

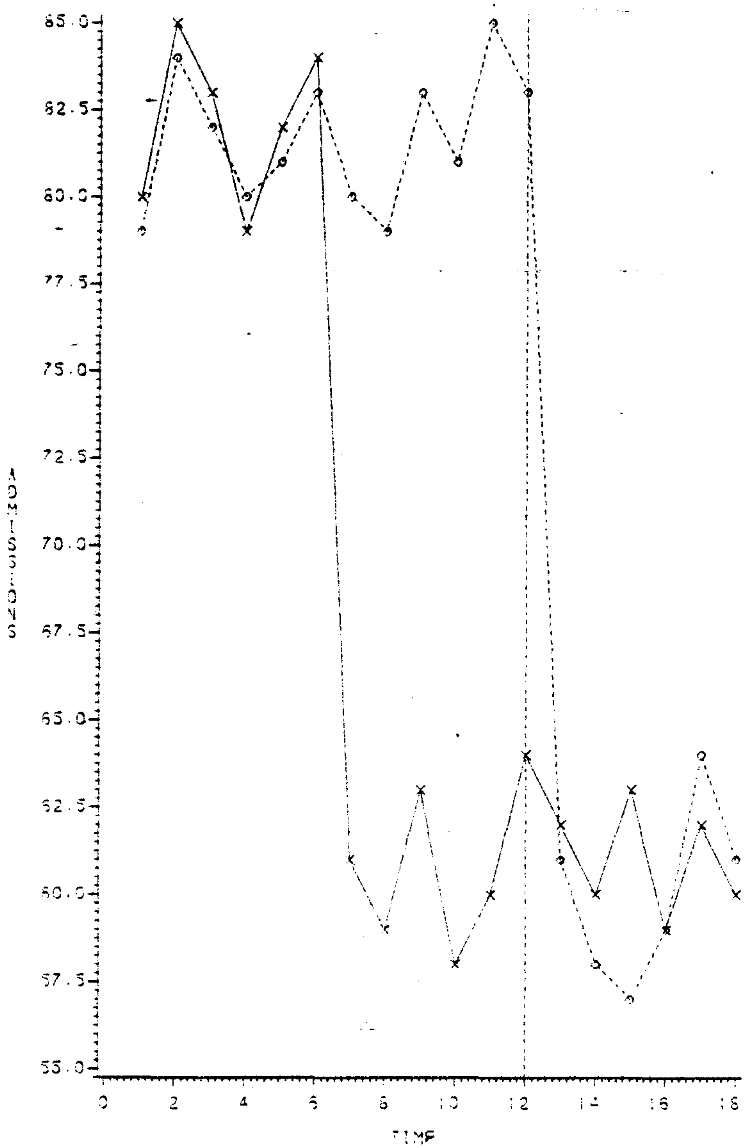
2) they allow the researcher to predict future values of the series; and 3) they allow one to test the effect of the intervention as well as the pattern of the effect over time. That is, if the intervention had a significant effect (changes in the level or the slope of the post-intervention series), then the questions of how long the effect lasted and whether the effect was abrupt or gradual can be addressed.

A More Complex Time Series

The interrupted time-series in this study was more complex than the design depicted in Figure 4. First, PACT screening, in all likelihood, did not begin abruptly. It probably took CMHCs a month or more to ready their staff, to contact referral sources in the community and to establish needed working relationships with State Hospital personnel. Second, the effect, if any, of CMHC's did not occur immediately. Some time surely elapsed before clients and referral sources began to come to the CMHC first, rather than going immediately to the State Hospital. The shape of the effect for all admissions was expected to look like the one depicted in Figure 5 rather than the simple effect in Figure 4.

This study, however, did not look at a single group as Figure 4 implies. An additional group, which also received the treatment was added, as well as a no-treatment control group. The two groups that received the treatment are called switching replicates.

Adapting Cook and Campbell's (1979) diagram of a two group interrupted time-series with switching replications design for the three groups in this study, we have:



LEGEND x Group One ◇ Group Two

FIGURE 5: Hypothesized interrupted time-series with PACT as the interruption and total admissions as the effect.

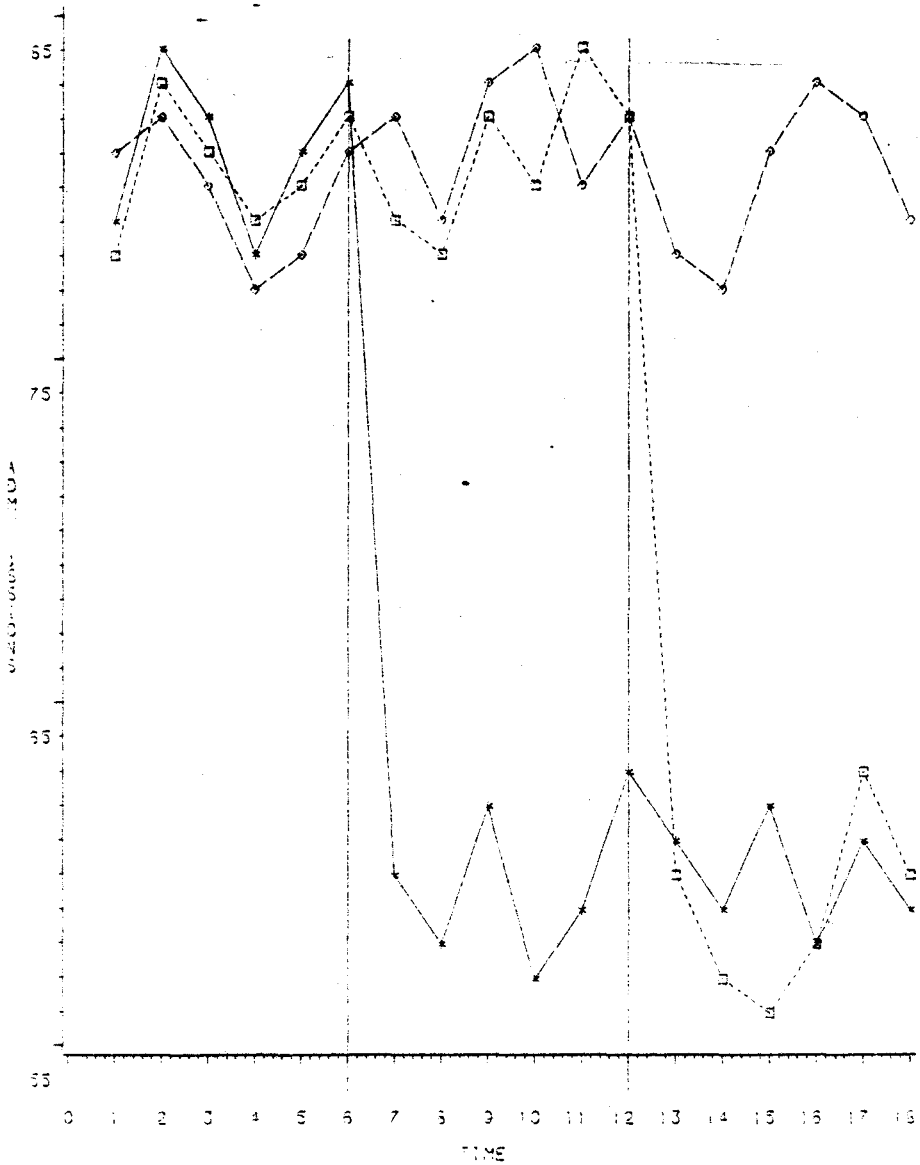
Group One	0	0	0	0 X	0	0	0	0	0	0	0	0
Group Two	0	0	0	0	0	0	0	0 X	0	0	0	0
Group Three	0	0	0	0	0	0	0	0	0	0	0	0

In the first phase Group One received the treatment, while Groups Two and Three served as the controls. Twelve months later, Group Two received the treatment while Groups One and Three served as the controls. The effect of the switching replications in this study was expected to resemble Figure 6 below.

Strengths and Weaknesses of Time Series Designs

The interrupted time-series design with switching replications controls for most internal validity threats. It also creates a favorable situation for testing external and construct validity because different units receive the same treatment at different times in different locations. The design also can help one to detect effects that have an unknown delay period - certainly the case in this study (Cook & Campbell, 1979).

Glass, Willson, and Gottman (1975) and Cook and Campbell (1979) discussed the various threats to validity in time-series designs. Wharton (1978) also reviewed these threats as they applied to her time- series study of the introduction of television and its effect on consumer purchase behavior. The strengths and weaknesses of the switching replications design are discussed here as they related to the present study.



LEGEND * Group One ◘ Group Two ◇ Group Three

FIGURE 6: Effect of switching replications in an interrupted time-series study with a no-treatment group.

Specifically, threats to internal validity, external validity, construct validity, and statistical conclusion validity are reviewed.

Internal Validity

The central issue of internal validity in this study was whether one could state that participation in the PACT program caused a significant drop in State Hospital admissions from participating counties. A threat to internal validity occurs when an alternative variable, other than the independent variable (the PACT program), could have influenced a drop in State Hospital admissions. The time-series design controlled for the threats to internal validity by (a) a series of observations on admissions over 84 consecutive months, (b) switching replications and a no-treatment control group, and (c) many counties within each replicate.

Selection. The most serious threat to internal validity in this study was selection. The PACT program was voluntary and it was possible that the first CMHCs to join PACT were among the more progressive CMHCs in the state. It is also possible that Group Three, for example, was waiting for participation in PACT to be mandated by the state or that they were waiting for a sizable monetary incentive to join PACT. If that were true, then differences across groups might have been due to their inherent differences and not due to differences in the timing of the PACT interventions. Interactions of selection with history, maturation and instrumentation also were possibilities with the multiple group time-series with switching replications (Glass, Willson, & Gottman, 1975).

History. Events, other than the PACT program, may have caused a change in the level or slope of mental health admissions. An alternative explanation would be supported if admissions for non-participating counties, alcohol and drug patients, or YRC patients dropped at or near the time of the PACT interventions.

History was controlled for in this study by having switching replications and a no-treatment control group. Unique events would have had to occur in each group at different times that coincided with the introduction of PACT in order to make other explanations plausible. Local history (selection x history), however, may have been a problem if the groups differed significantly from each other. If the same effect, a drop in admissions, occurred in Group One and then in Group Two after they each joined the PACT program, and Group Three's admissions rate did not change significantly, then history would not be a likely alternative explanation for the results.

Instrumentation. The method of measuring admissions may have changed over the years in Kansas. State Hospitals, for example, may have improved in their ability to distinguish readmissions from first admissions. Certainly there was an instrumentation problem in FY 1976 with missing data for mental health and alcohol and drug admissions. This problem would have been more serious if it had occurred in the same year that the PACT program began.

Where measurement procedures are defined by a larger entity, such as the state in this study, instrumentation changes will tend to affect the measurements in all locations at once. In most cases this would resemble the effect of history and was controlled for by the switching replications. Interviews of SRS Research and Statistics staff revealed that no known changes in the admissions reporting procedures or definitions had been made over the years included in the study.

Maturation. There may be a natural decline pattern in mental health admissions since the push for deinstitutionalization by the Federal government had been present since the early 1970's. It might be possible to mistake this historical decline for an effect of the PACT screening program. The threat of maturation, however, is more serious in single pre- and post-treatment observations than it is in time-series designs. The chance of detecting a declining or rising trend was very high because observations of State Hospital admissions were made over time in three groups. Cyclical or seasonal variation would be detected as well, since seven years of data were included in the study.

Less Plausible Threats to Internal Validity. CMHC staff had ample opportunity to discuss the PACT program with each other. The Department of SRS also made PACT a very visible program, both with CMHC directors and with the State Legislature. It was possible for non-participating counties to follow the philosophy of PACT without officially participating in the program. Diffusion or imitation of treatments may have occurred in some CMHCs, but aggregating the catchment areas served to cancel out this threat. Furthermore, treatments seldom are imitated when participation in a program is voluntary. Those who wanted the program had ample opportunity to volunteer for it.

Statistical regression was not a plausible threat in this study, since counties or CMHC catchment areas were not chosen on the basis of whether their admission rates were high or low, compared to other counties. CMHCs volunteered to participate in the program and no volunteers were turned down by the state. In addition, the long time-series would enable one to detect statistical regression in the series.

Mortality was not a problem since none of the CMHCs dropped out of the PACT program once they had joined. None of the counties changed CMHC catchment areas, except that Miami and Labette counties opened their CMHCs. The opening of these CMHCs, however, did not coincide with the PACT intervention.

Ambiguity about the direction of causal influence was not as much of a problem in this study as it would have been in a cross-sectional study. The long time-series gave the researcher an opportunity to detect sequential changes in the data. Finally, other threats to internal validity, such as compensatory equalization, compensatory rivalry, and resentful demoralization, were not likely problems in this study because no extra funds were given to non-participating CMHCs, there was no particular disadvantage to the other CMHCs if the program was successful, and clients were not aware of the program since it was an administrative, rather than a treatment program.

External Validity

External validity has to do with generalizing the results of a study across other persons, settings, and times. The multiple group time series with switching replications design used in this study provided several populations, settings and two different times to demonstrate the effect of a drop in admissions due to the PACT screening program. One limitation of the present study was that only one state was observed. It would be difficult to say how these results would apply to another state, particularly a more industrialized, urban state.

Construct Validity

Construct validity refers to the problem of confounding, or whether the independent variable as defined and implemented and the dependent variable as defined and measured reflected the constructs of interest. The Hawthorne effect, for example, could have been a confound in this study. If there was a drop in admissions, then it could have been due to the PACT screening program or to the increased attention given to the participating CMHCs by state mental health personnel and non-participating CMHCs.

The purpose of the PACT program was to reduce State Hospital admissions, so that more people would be treated in their communities as near to their homes and families as possible. Measuring first admissions and readmissions to State Hospitals directly corresponds to the first part of the goal. Whether the reduction of State Hospital admissions also meant that people were being treated in their home communities was not directly measured, although readmissions may be an indicator of this. Yearly data on the number of persons served in CMHCs does indicate a doubling of clients between FY 1972, approximately 30,000 persons, and FY 1980, approximately 65,000 persons (SRS, 1981).

Other threats to construct validity were of less concern. These included hypothesis guessing, evaluation apprehension, experimenter expectancies, and the interaction of testing and treatment. The study used archival data and clients were not tested specifically for the study's purposes.

Statistical Conclusion Validity

Cook and Campbell (1979) related statistical conclusion validity to the covariation of the independent and dependent variables. When the independent and dependent variables covary, we assume that they are related. Some threats to statistical conclusion validity and, therefore, to drawing valid inferences about whether two variables covary include low statistical power, violated assumptions of statistical tests, multiple comparisons and the instability of measures. All of these threats can be problems in time-series studies if typical statistical analyses are performed on the unmodeled data.

Time series usually have correlated error terms. Present values in an autocorrelated series, therefore, are predictable to some extent from past values. Usually, no more than two prior values have a statistically significant relationship with the present value of the series (McCleary & Hay, 1980). This autocorrelation violates the assumption of independent errors, making approaches, such as ordinary least squares (OLS), inappropriate for analyzing time-series data (McCain & McCleary, 1980; Ostrom, 1978). Gottman and Glass (1978) also explain that if data are autocorrelated, then a _t_ -test will produce false results. When _n_ is large, Type I (false positive) errors are underestimated when the autocorrelations are positive and overestimated when the autocorrelations are negative.

The statistical procedures used in this study are based on the Box-Jenkins (1976) Autoregressive Integrated Moving Average (ARIMA) statistical models. The ARIMA method allows one to statistically model the time-series data and obtain unbiased error estimates. A discussion of these models and how they are used are presented in the next chapter.

CHAPTER III

ARIMA MODELING AND STATISTICAL ANALYSIS

The statistical methods used in this study include the Box-Jenkins (1976) modeling strategies and t-tests for interventions. This chapter presents the Box-Jenkins statistical procedures used to model the autocorrelated data in the switching replications design and test for the PACT intervention. The procedures presented here are based upon discussions of the ARIMA method in a number of sources (Box & Jenkins, 1976; Glass, Willson, & Gottman, 1975; Gottman & Glass, 1978; Gottman, McFall, & Barnett, 1969; McCain & McCleary, 1980; McCleary & Hay, 1980; McDowall & McCleary, 1980; Ostrom, 1978; Wharton, 1978).

Box-Jenkins ARIMA Modeling

One needs at least 50 observations to confidently build and identify an ARIMA model. If there are less than 50 observations, then the ARIMA approach will not be the best tool to use. If a series is short and the errors are independent, then a repeated measures ANOVA is appropriate to measure the significance of the intervention effect. If the series is short, but the errors are correlated, then a MANOVA or repeated measures ANOVA with the Geisser and Greenhouse correction may be more appropriate (McCain & McCleary, 1980). The BMDP (1981) computer software package has a repeated measures ANOVA with the correction available. The Geisser and Greenhouse (1958) correction yields a conservative *F*-test by reducing the degrees of freedom (*df*) in the numerator and denominator of the *F*-test. When 50 to 100 or more observations are available and the errors are uncorrelated, ordinary least squares (OLS) regression may be used.

Deterministic and Stochastic Model Components

The deterministic component of a model describes systematic behavior in the data. McCain and McCleary (1980) call it "trend", which is any systematic change in the level of a time-series. Trend must be removed or "modeled". The ARIMA approach is one of the most effective ways to detrend a series.

The stochastic component of a time-series model describes error. The stochastic component consists of systematic and unsystematic (random) error. The ARIMA method models the systematic error in the stochastic component, leaving only the random error process unaccounted for by the model. It is at this point, when there is only random, independent error remaining, that unbiased estimates of the standard deviations can be calculated.

The Switching Replications Model

The discussion of the multiple group interrupted time-series with switching replications and a no-treatment control group in Chapter 2 was concerned with the design's adequacy in addressing questions of validity. The design also has an influence on the statistical analysis of the data.

It would be sufficient in order to increase internal and external validity, to analyze each group separately to see if the independent variable (State Hospital admissions) in the two treatment groups at different times in different settings. In addition, one would test Group Three, the no-treatment group, at the time of each intervention, expecting the intervention components of the model to be non-significant.

If the design consisted of only two groups with switching replicates, it would have been weaker. The use of a comparable control that was never affected by the interruption provides another comparison, ruling out alternative explanations, such as another event occurring at the same time as the two interventions that effected a drop in State Hospital admissions. Another point is that there is a relatively short time span (12 months) during which Group One and Group Two are different. The shorter the time span between the replicates, the weaker the design. The no-treatment control group (Group Three) provides a group that is always different from the group receiving the treatment.

Understanding how the ARIMA approach allows one to analyze the switching replications design requires a description of a model. Focusing on the analysis of Group One, the following symbols would represent the components of the model for the group.

$\underline{Y}1$ = the time-series measuring State Hospital admissions for Group One

I1 = the introduction of PACT into Group One

a(Y1) = fluctuation unaccounted for in Y1

The model for Y1, for example, would be written as Y1=f{I(Y1), a(Y1)}, where I(Y1)=the deterministic component of the model and a(Y1)=the stochastic component of the model. ARIMA models assume that random shocks (random errors), a(t)s, are the primary predictors of a time-series, Y(t). To a lesser extent the present value in a series, Y(t), also may be predicted by a(t-1), the previous input, and Y(t-1), the previous output. Relating this to the present study, this would mean that the number of State Hospital admissions for a particular group at time t, Y(t), is primarily predicted by a random number of admission eligible persons who present themselves at CMHCs or other referral sources at time t, a(t), and to a lesser extent, the number of eligible persons in the previous month, a(t-1), and the number of people admitted to the State Hospitals the previous month, Y(t-1). If a large number of admissions are made in December, for example, then there are fewer people available for admission in January and, therefore, January admissions are likely to be lower than December admission totals.

The ARIMA approach uses transfer function modeling to relate a series to interruptions, Is, or causal series. This measures the deterministic or predictable component of a series.

The overall procedure is to first identify the ARIMA models for each group. The identified model is then entered into the transfer function analysis to see whether the intervention component was significant and, therefore, necessary for the model to explain the data.

ARIMA Structural Parameters

Stationarity. A particular ARIMA model has three structural parameters, p, d, and q. Parameter d is concerned with stationarity and addresses the question, "Is the series stationary about its mean?" A series is stationary when there is no trend. Only stationary series can be modeled if the ARIMA method is used. If there is a trend present, then it is removed by "differencing" the series. A series is differenced by subtracting the first observation from the second, the second from the third, and so on. This yields a new time-series, which may or may not have a trend. If a trend is still present after the first differencing, then the series is differenced again. A series rarely has to be differenced more than twice because, as was mentioned previously, typically, no more than two prior inputs and outputs have a statistically significant relationship with a present value (McCleary & Hay, 1980). Parameter d's value is determined by how many times a series is differenced -- e.g., d=1 means that a series has been differenced once and d=2 means that a series has been differenced twice.

Autoregression. The parameter, p, indicates the autoregressive order of an ARIMA(p,d,q) model. Autoregressive dependency occurs when the current value in a series, Y(t), is a function of past values of the series (Y(t-1),Y(t-2), etc.) and a present independent random shock, a(t). This is written as Y(t) = 01Y(t-1) + 02Y(t-2) + ... + OpY(t-p) + a(t). The 0 (phi) -coefficients indicate the magnitude of Y(t)'s relationship with its past values. When a series has significant correlations between present and past values, the value of p is greater than 0 (the number of significant 0's). Again, rarely is p greater than 2.

Moving Average. The structural parameter, q, refers to the moving average order of an ARIMA(p,d,q) model. Moving average dependency occurs when the current value in a series, Y(t), is a function of a current random shock, a(t), and past random shocks (a(t-1), a(t-2), etc.). This is written as Y(t) = a(t) - 01 a(t-1) - 02 a(2)a(t-2) - ... - 0q a(t-q). The 0 (theta) coefficients indicate the magnitude of the dependency of Y(t) on past shocks in the series: The parameter q is greater than 0 when one or more of the 0's are significant. Typically, no more than two coefficients are significant.

Integrated or Mixed Models. It is possible to have an ARIMA model with significant autoregressive and moving average parameters. When this is true, the model describes the series as one in which Y(t) is dependent upon one or more preceding observations (p > 1) and preceding shocks (q > 1). Mixed models are very rare.

ARIMA Identification, Estimation and Diagnosis

The ARIMA analysis procedure determines if there are dependencies in the time-series, identifies what form the dependencies take (autoregressive, moving average or mixed model), determines the number of past observations (p) or random shocks (q) or both which have a significant influence on Y(t), and estimates the values of the 0 and 0 coefficients of the model.

A number of steps are necessary to identify an ARIMA model for a time series. The various steps are called identification, estimation, and diagnosis. Identification refers to the steps involved in developing hypotheses about the model's structure (autoregressive, moving average, or mixed). Estimation involves determining the values of the 0 and/or 0 coefficients given an identified model. Diagnosis involves testing the adequacy of the model.

Identification

Identifying the proper model of the stochastic component of the time series is important to the validity of the test for the intervention. Padia (1977) discussed three common types of model misidentification: white noise processes in undifferenced data; white noise processes in first-differenced data; first order autoregressive processes; and, integrated moving average processes. Misidentification includes underfitting a model (e.g., identifying a second-order moving average or autoregressive process as a first-order process), misfitting a model (e.g., identifying an autoregressive process as a moving average process), and under- or overestimating the difference parameter, d. Overfitting a model is not a serious problem because the extra parameters are zero in the true model.

Mis-identifying the d parameter is the most serious of the three identification errors. The failure to correctly identify d leads to incorrect error probabilities. Overestimating d is not as serious as underestimating it. Over-differencing a d=0 series only produces some discrepancies in the white noise cases with the actual alpha level less than the nominal alpha level. Over-differencing a d=1 series yields actual alpha levels greater than nominal alpha levels in the white noise case and in other models.

The most serious disturbance of Type I error occurs when a process is non-stationary in level or non-stationary in level and slope and is assumed to be stationary at d=0 (i.e., d is underestimated). The Type I error probabilities become .80 to .90 in this situation, almost guaranteeing a "significant" intervention effect. The effects are so severe that the actual rates are almost identical for all three nominal alpha levels of .10, .05 and .01.

Proper identification of d is the most critical step, then, in the identification stages of ARIMA modeling. In general, Padia (1977) says that underdifferencing leads the researcher to greatly underestimate power and operate conservatively with respect to Type I probabilites. Over-differencing produces situations in which the power is overestimated and operates conservatively with respect to Type II error.

Several things can be done to minimize the chances of model mis-identification. One is to select or generate time-series with a large number of observations (50 pre-intervention and post-intervention as a minimum). It is more difficult to determine the proper d required for stationarity when there are a small number of observations. McCleary and Hay (1980), as well as Padia (1977), recommend metadiagnosis as another way to minimize model identification errors. Metadiagnosis involves purposely underfitting and overfitting models to the time-series. If an accepted model is diagnosed as adequate, then the next level of p or q model's parameters (greater than or less than the parameters of the accepted model) should not be statistically significant.

Identification Step 1. The first decision that must be made concerns how much of the series to model. If the intervention appears to have distorted the plot of the raw data, then only the pre-intervention data should be used (Hibbs, 1977; Stoline, Huitema, & Mitchell,1980). If the effect of the intervention appears to be relatively minor, then the entire series may be used in the ARIMA analysis. In this research pre-intervention points were used for all of the time-series.

Identification Step 2. ARIMA modeling is valid only for stationary series, as indicated in the discussion above of proper identification of the d parameter. If the process is non-stationary, then the series must be differenced or transformed.

What are the implications in transforming the data in some way? Generally, once the data are differenced they are not strictly the same as the original data. Any conclusions drawn from the transformed data typically are applied only to the transformed data. Generalization to the original data is limited. This is not a serious problem when the data are differenced once or twice, since the transformation is straightforward, but when data are log transformed or power transformed it becomes more difficult to generalize the results obtained with the transformed data to the original data.

Most series can be made stationary through the differencing procedure described previously. Any series which increases or decreases linearly can be made stationary by a first differencing. Curvilinear processes will need to be differenced twice and so on. Differencing a series makes it "stationary in the homogeneous sense" (Cook & Campbell, 1979). Some series are non-homogeneous and non-stationary. These series need special transformations to make them homogeneous, because any number of differencings leaves them non-stationary. Log transformations are the most common means of making these series homogeneous.

Non-stationarity in a series is determined by examining the autocorrelations (ACFs) of the series, usually up to the 25th lag so that seasonality can be identified. The ACF is the correlation between the time-series and its lags. Lagging a series means pushing the entire series forward as illustrated below:

Lag 0	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)
Lag 1	.	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)

Each time a series is lagged a pair of observations is lost. This means that the later lags of the ACF are estimated from fewer observations and are less reliable. If the list or plot of the ACFs for the lags shows a very slow decline (referred to as dying out slowly), the series is non-stationary. Proper differencing should reduce the magnitude of the ACFs and bring the ACFs to near zero within four to five lags.

The procedure is to have the ACFs computed and plotted as a correlogram which can be inspected and evaluated. Figure 7 displays a sample ACF correlogram. If the ACFs die out slowly, then the series would be differenced. A correlogram of the differenced series would then be computed and plotted to determine if the differenced series was stationary. This procedure would be repeated if it appeared that it was necessary to difference the series again. The d parameter would be equal to the number of times the series was differenced before achieving stationarity.

Identification Step 3. If the time-series data are quarterly, monthly, weekly, etc., there may be seasonal non-stationarity in the data. This was referred to earlier as cyclical or seasonal patterns in the data. Seasonal (annual) non-stationarity is characterized by a slow decline in ACFs, starting at lag s (where s = seasonal period, 12 for monthly, 4 for quarterly, etc.) and incrementing by s. In this study seasonal non-stationarity would be evidenced by spikes at lags 12, 24, 36, 48, and so on, that slowly die out.

If the data are seasonally non-stationary, the series must be seasonally differenced, where each value would be subtracted from the value s time periods ahead. A correlogram of the seasonally differenced

PLOT OF SERIAL CORRELATION

```
      -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0

LAG CORR+----+----+----+----+----+----+----+----+----+----+
                                 I
 1 -0.327                XX+XXXXXI     +
 2  0.072                 +      IXX    +
 3 -0.000                 +      I      +
 4 -0.089                 +    XXI      +
 5 -0.108                 +   XXXI      +
 6 -0.128                 +   XXXI      +
 7 -0.058                 +     XI      +
 8  0.041                 +      IX     +
 9 -0.129                 +   XXXI      +
10  0.208                 +      IXXXXX +
11 -0.033                 +     XI      +
12  0.167                 +      IXXXX  +
13 -0.165                +   XXXXI       +
14  0.216                +       IXXXXX  +
15 -0.017                +       I       +
16 -0.015                +       I       +
17 -0.082                +     XXI       +
18  0.082                +       IXX     +
19 -0.199                +  XXXXXI       +
20  0.048                +       IX      +
21 -0.157                +   XXXXI       +
22  0.064                +       IXX     +
23  0.035                +       IX      +
24  0.142                +       IXXXX   +
25 -0.000                +       I       +
```

FIGURE 7: An example of an ACF correlogram.

series would then be computed and plotted to determine if all seasonal stationarity had been removed. The seasonal ARIMA component will usually be of the same type (autoregressive, moving average or mixed) as the regular component. The seasonal difference parameter is D.

Identification Step 4. Once the series is stationary, two kinds of correlograms are necessary to determine the form of the model. The first kind is the ACF correlogram. The second kind is the partial autocorrelation (PACF) correlogram. A PACF is the ACF with the effects of previous time points partialed out.

Two kinds of ACF or PACF patterns are used to describe the autoregressive and moving average models. One is the decay pattern of the ACFs and PACFs and the other is the spike pattern. The ACF pattern in Figure 7 is spiked, although the spike is slight. A decay pattern would have more spikes in the first few lags that exceeded the confidence intervals (the +'s) and that declined in value from lag to lag. Rapid decay is indicated by the ACFs being non-significant after the first three or so lags. Slow decay is evident when the ACFs remain significantly greater than zero for 4, 5 or more lags. The evaluation of the regular model is done first and then the seasonal model is identified if it is indicated by the ACF and PACF correlograms. The regular ARIMA model is defined at lag 1 and adjacent lags. The seasonal model is defined at lag s and adjacent lags. Table 8 lists the model types and their characteristic decay and spike patterns.

TABLE 8

Patterns for ARIMA Models

Model Type	Autocorrelation Pattern	Partial Autocorrelation Pattern
White noise	zero	zero
Autoregressive	decay	spike
Moving Average	spike	decay
Mixed	decay	decay

Identification Step 5. The last identification step involves determining the number of parameters in the model, also called the order of the model. In the autoregressive model, there are no Θs and, therefore, q and Q (the seasonal moving average parameter) are equal to zero. There is one Θ for each spike in the PACF correlogram. The number of spikes starting at lag 1 equals p, while P equals the number of spikes starting at lag s. The moving average model has no Θs and p and P are zero. There should be one Θ for each spike in the ACF correlogram. So q equals the number of spikes starting at lag 1 and Q equals the number of spikes starting at lag s.

Estimation

The estimation step determines the values of the parameters, Θ and Θ. The model specified in the identification steps is entered into the computer program for an ARIMA(0,1,1) model (a moving average model with a series that has been differenced once), for example, would look like this for the estimation phase:

```
ARIMA          VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDERS IS '(1)'./
ESTIMATION     RESIDUAL=RGROUP1./
ACF            VARIABLE IS RGROUP1. MAXLAG=25./
```

These instructions tell the program what the identified model is, calls the residuals RGROUP1, and asks for the ACF correlogram (up to lag 25) of the residuals.

The output of the estimation step is an estimated value for each of the specified parameters and tests of their statistical significance (*t*-tests) for these parameters. If one or more of the specified parameters are not statistically significant, the parameter should be dropped from the specification statement and the estimation step repeated.

Diagnosis

Once a model has been identified and estimated, it is necessary to test whether the model adequately describes the data. This is done by evaluating the residuals from the model, the unexplained portion of the data. When a model is correctly specified and estimated, the residuals should have independent and identical normal distributions, i.e., the ACF and PACF residuals should look like a white noise process. The residual ACFs for all lags should not differ significantly from zero. Using the .05 significance level, however, one would expect a few of the lagged ACFs to be significant anyway. An exception to this would be if the spike in the ACF or PACF occurred in the first few lags of the correlogram. As an example, if an ARIMA(0,1,1) model was being diagnosed (a first-order moving average model with a first differencing) and there was a spike at lag 2 in the residual ACF, then an alternative model should be tried, ARIMA(0,1,2). A spike at lag 2 in the residual ACF would be very strong evidence of an incorrect model, but a spike at lag 7 would not.

If the diagnosis step reveals an inadequate model, the analyst would repeat the estimation step with a new model specified or go back to the identification steps, if necessary.

Summary of Modeling Steps

The following list is a summary of the strategy used in this study to identify, estimate and diagnose an ARIMA model for each time-series.

1) The ACFs and PACFs were computed from the raw time-series by the BMDP program.

2) If the ACF did not die out rapidly, then the series was differenced until it did. The number of differences required was the value of d. No more than 1 or 2 differencings were required.

3) The correlograms were examined for decay in the ACF and PACF. If the ACF decayed (died out) rapidly, an autoregressive model was indicated. If the PACF died out rapidly, then a moving average model was indicated.

4) After identifying the time-series as either autoregressive or moving average, the values of p and q were determined from the number of spikes in the PACF (for autoregressive models) and the ACF (for moving average models). The lowest possible values of p and q were tested to avoid overmodeling the data.

5) If both the ACF and the PACF decayed rapidly, then a mixed model was indicated.

6) If a model could not be identified after several attempts, then a log transformation of the series was done and the ACFs and PACFs were once again computed.

7) Estimates of the identified model parameters were obtained. The parameters for first-order autoregressive and moving average models must be within the bounds of a -1 and +1, but should not equal -1 or

+1. Second-order models have more complicated bounds and the computer package indicated when these bounds were exceeded. Unacceptable estimates usually mean that a series has not been correctly differenced. Another point that was checked was whether the parameters were statistically significant. If they were not, then they were dropped from the noise model.

8) The last step was to check the ACFs of the residuals. The residual ACFs would be zero for all lags if the residuals were white noise and the goodness of fit statistic, Q, would not be significant. If spikes appeared in lag 1 or 2 of the residual ACFs, then the identification, estimation and diagnosis process began again.

Transfer Functions

ARIMA processes model the stochastic behavior within each series, while transfer functions describe the deterministic relationships between two or more series. In this study, the researcher was interested in describing the relationship between the admission data time-series for Group One and the intervention time-series, I1, as well as the relationship between Group Two and intervention time-series I2.

Intervention components must be modeled for the interrupted time-series. If the intervention component increases the ARIMA model's predictability, then the parameters of the intervention component will be statistically significant. The general transfer function model is:

$$(1 - s(1)B - s(2)B^2 - \ldots - s(r)Br)Y(t) =$$

$$(w(0) - w(1)B - w(2)B^2 - \ldots - w(s)BsX(t-b) + N(t).$$

B is the backward shift operator that has the effect BY(t) = Y(t-1) and where both the Y and the I series are stationary. The structure of the transfer function model is described by three parameters: r, b and s. The number of prior Y observations used to describe the current Y observation is represented by r, while b is the I lag parameter which indicates how many time periods will elapse before an event in X will be reflected in Y. The s parameter represents the number of X observations that are needed to explain the present Y observation. The N(t) in the general transfer function model is the noise model describing the stochastic component of Y. It is the ARIMA model describing that portion of Y not explained by the intervention, I. The process of specifying the transfer function structure and estimating the parameters (the s's and w's) is done in a manner similar to the ARIMA modeling process.

The basic analysis information is the cross correlogram. It is the list or plot of correlations between I and Y for various lags between I and Y. In general, if the lag is b, the lagged cross correlation reflects a relationship between Y(t) and I(t-b).

When I is a true causal variable, the form of the transfer function can vary from problem to problem. When I is a covariate, only the simplest b=0, r=0, s=0 model is appropriate. Interruptions, however, follow a different process because interruptions are indicated by binary dummy series. There are two main forms for these binary dummy series. The step function is a binary dummy series that has a 0 value for all time periods before the intervention and a value of 1 for all time periods thereafter. A pulse function is a binary dummy series that has a value of 1 at the point of intervention and a 0 value for all other time periods. These dummy series have no stochastic error components.

In the absence of empirical specification of the interruption transfer function structure, such as with the dummy series, a priori transfer function structures must be employed.

If the original output series (Y) is non-stationary and requires differencing to make it stationary, then the binary dummy interruption series must be differenced the same number of times. Three forms of the intervention transfer functions are discussed below.

Abrupt, Constant Change

This transfer function is of the following form:

$$\underline{Y}(t) = \underline{wI}(t) + \text{noise}$$

The parameter, w(omega), is the magnitude of the change in level. I(t) is a dummy variable that equals 0 before the intervention and 1 when the intervention occurs and thereafter. The intervention hypothesis test is a test of significance for the omega parameter.

Gradual, Constant Change

When this transfer function is appropriate, the time-series changes its levels gradually, beginning at the point of intervention, and increases from one observation to the next until it reaches its ultimate level. The function's equation is:

$$\underline{Y}(t) = \underline{sY}(t-1) + \underline{wI}(t) + \text{noise}$$

The parameter, s, determines how gradually the series will change its level. When s is large, around .9, the series reaches its level slowly. When s is very small, .1, the series reaches it ultimate level almost immediately. Note that the s parameter must be between -1 and +1 to be interpretable. If s is positive, then the effect has a smooth shape. If s is negative, then there are alternating ups and downs in the effect pattern. This would occur if the intervention also caused a temporary increase in variablility. The test of significance is for s and w.

Abrupt, Temporary Change

In this transfer function, I(t) is defined as a pulse function. It is 0 before the intervention, 1 at the point of intervention, and 0 after the intervention. The series displays a spike at the point of intervention and after a time, returns to its original level. The function's equation is:

$$Y(i+n) = s^{n} w$$

Again, when s is large, the treatment effect lingers for a long time.

Intervention Functions For The Present Study

Two time-series were constructed to represent the two intervention time series. The first intervention time-series was a string of 63 zeros (the number of months before the initiation of PACT) followed by a string of 21 ones (the number of months observed after the initiation of PACT). The second intervention was represented by a string of 75 zeros (the number of months before Group Two joined PACT) followed by nine ones (the number of months remaining after Group Two joined PACT).

These intervention series are described as transfer functions in the BMDP program. They are added to the identified ARIMA model for each group and tested with a *t*. If the intervention is significant, then it helps to explain the data and is accepted as part of the model.

Statistical comparisons could not be made between groups in this study since a generally accepted test has not been created (Hay, personal communication, 1982). A pattern of intervention effects, however, was expected in the three groups. The intervention function, I1, should be significant for Group One, but not for Group Two or Group Three in mental health first admissions and mental health readmissions. In addition, the second intervention, I2, should only be significant for Group 2 in mental health first admissions and readmissions. Neither the first nor the second intervention should be significant for Group 3. All significant interventions were expected to be negative.

Similarly, none of the interventions should be significant for any of the groups in alcohol and drug admissions and Youth Rehabilitation Center admissions, since these admissions were not eligible for the PACT screening program. The closing of an alcohol treatment unit at one of the State Hospitals, however, was expected to have a significant impact on the number of alcohol admissions. A third intervention series was constructed to reflect the closing of the alcohol treatment unit. Table 9 summarizes the expected results.

TABLE 9

Expected Results

	1st Intervention	2nd Intervention
Group 1	significant, negative	n.s.
Group 2	n.s.	significant, negative
Group 3	n.s.	n.s.
Alcohol & Drug	n.s.	n.s.
YRC	n.s.	n.s.

CHAPTER IV

RESULTS

A description follows of how the computer packages were used and how judgments were made about the usefulness of particular models. Plots of the raw data are included, as well as the autocorrelations and partial autocorrelations for each series. The intervention component analyses also are presented. The model identification, estimation and parameterization, in addition to the intervention analyses are presented for mental health first admissions, then mental health readmissions, alcohol and drug first admissions, alcohol and drug readmissions, and YRC admissions. The post-hoc analyses are also presented.

The first step in the data analysis was to identify, estimate and diagnose the ARIMA models that describe the systematic error in each series. The results of these steps are presented in Appendix A. These models were used to specify and test the interventions. An alpha level of .05 was chosen as the significance criterion for the one-tailed *t*-test of the intervention. All *t*'s were expected to be negative.

Graphs of the admission series are presented later. The times of the two interventions are indicated by the vertical broken lines. The first line is at October 1978, while the second is at October 1979. An effect was suggested if the series changed considerably following either one or both of the dashed lines.

The statistical analyses of these interventions are presented at the end of the chapter.

The Computer Software Packages

The Statistical Package for the Social Sciences (SPSS) and the Biomedical Program (BMDP) were used in the analyses. SPSS was used to plot the raw data of the individual series and to do preliminary model identification. BMDP was used more extensively to do further model identification, parameter estimation and model diagnoses. BMDP also was used to test the intervention components. The SPSS Box-Jenkins procedure did not allow intervention components to be specified and tested.

The Statistical Analysis System's (1981) SASGRAPH software program was used to do the data plots, maps and other figures for this dissertation.

Model identification was done by specifying the variable, the time period (for SPSS), the degree of differencing desired (if any), and the number of lags to be displayed. The exact sequence of computer instructions and options cannot be predetermined. The first step, however, usually involves plotting the raw data for each series. These plots are inspected to determine whether the interventions seriously disrupted the series. If they have, then only the pre-intervention points are used in the subsequent modeling steps.

Once a decision is made on what portion of the series to use, the autocorrelation (ACF) and partial autocorrelation (PACF) functions for each series are computed and plotted. Typically, these first ACFs and

PACFs are requested for the undifferenced series, unless the raw data plots strongly indicate a seasonal or regular trend. In BMDP, the ACF output reports the number of observations, the mean of the series, the standard error of the mean and the _t_ value of the mean against zero. The _t_ value is only valid when the series is stationary. The autocorrelations for the specified number of lags (the default is 36 lags in both programs) are printed along with their standard errors. A plot of the serial correlations and their 95% confidence intervals concludes the ACF output.

The ACFs for each series are examined for rapid decay and the lack of seasonal spikes at lags 12 and 24. If the ACFs do not die out rapidly, then the series is differenced and the ACFs are computed and plotted again. When the series is differenced appropriately, the ACFs will decay rapidly.

The PACF is requested to aid in model identification. If the ACF decays and the PACF has one or more spikes, then an autoregressive model is indicated. If the ACF is spiked and the PACF decays rapidly, then a moving average model is indicated. The PACF instruction produces the same information as the ACF instruction -- number of observations, mean of the series, etc.

After a model is identified, the ARIMA instruction is used to specify the tentative model and the ESTIMATION instruction is used to obtain the parameter estimates. The ARIMA instruction specifies the variable or series, the autoregressive parameter orders (ARORDER), the moving average parameter orders (MAORDER), and the difference orders

(DFORDER) of the model.

The BMDP2T program has two methods of parameter estimation -- conditional least squares and unconditional least squares or backcasting. The program does conditional least squares first, followed by the backcasting method which uses the conditional least squares estimates as its initial values. Backcasting is more precise and, therefore, more costly. All parameter estimates and their accompanying information are taken from the backcasting portion of the computer output. The parameter estimation output specifies the type of parameter (MA or AR, trend, mean), which factor it is, its order, the estimate of the parameter, its standard error and a t-ratio for the parameter. If the t is not significant, then the parameter is not necessary to the model. If the estimate is very high, in the .90s, this indicates an incorrect model -- incorrect differencing or too many parameters specified.

When the correct model has been specified and estimated, the model's residuals should have independent, identical normal distributions. None of the ACFs or PACFs of the residuals should be significant. The ACF and PACF instructions, therefore, are used again after the estimates are obtained to check the model.

White Noise Models

When none of the ACFs and PACFs of a series are significantly different from zero, an ARIMA (0,0,0) model is indicated. White noise also may be apparent after a series is differenced, ARIMA (0,1,0) or ARIMA (0,2,0). In the first case, ARIMA (0,0,0), the mean of the series is the only parameter. In SPSS, one must specify P=0 (autoregressive order

= 0) and Q=0 (moving average order = 0) in the Box-Jenkins instruction to describe a white noise model. In BMDP, the CONSTANT command is used to indicate that the mean is the only parameter of the model.

Differenced series that have ACFs and PACFs which behave like white noise have a trend parameter. In SPSS, this is indicated by the DIFFERENCE or SDIFFERENCE (for seasonal differencing) command, followed by P=0 and Q=0. BMDP, again, uses the CONSTANT command in the ARIMA instruction to indicate that trend exists and the DFORDER command to indicate how many times the series was differenced. The MAORDER and ARORDER commands are not used in BMDP when the model is white noise.

Intervention Analysis

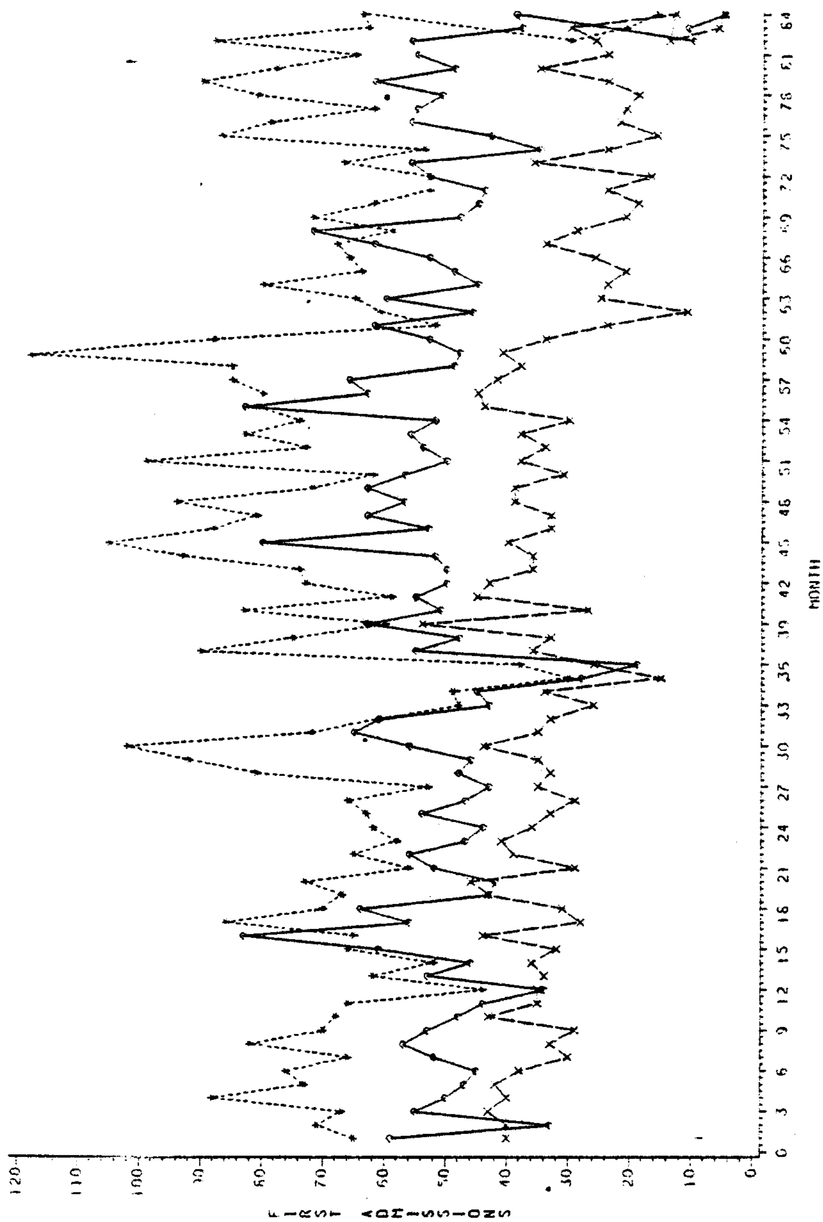
BMDP allows for intervention testing, while SPSS does not. The INDEPENDENT instruction is used in BMDP to specify a model for one or more interventions. In the present study, the interventions were all step changes (i.e., a series of 0s followed by a series of 1s). If the ARIMA instruction specified a DFORDER, then the INDEPENDENT instruction specified the same DFORDER, as suggested by Hay (personal communication, 1982) and Liu (personal communication,1982a). If the independent variable, the intervention, is a binary variable (0,1), this must be specified in the INDEPENDENT instruction.

Finally, the BMDP (1981) Box-Jenkins intervention analysis is discussed in different terms than is found in most texts and articles on time-series written for psychologists and other social scientists. Most articles and books refer to the phi and theta parameters, as well as to the difference orders of a series. The BMDP program, however, uses a combination of these parameters and refers to them as polynomials. Refer to Box and Tiao (1975) for a discussion of the polynomials used in the BMDP2T program. All of the interventions in the present study had a U-polynomial of zero order, written as UPORDER IS '0' and the D-polynomial was specified, when necessary, by the DFORDER IS 1 phrase (Liu, personal communication, 1982b).

The ESTIMATION and ACF instructions are used to estimate the model parameters with the intervention components added to the model. The intervention parameters are tested with a t-test. If the t is significant, then the interventions are associated with an appreciable change in the data. Again, if the ACFs of the residuals are essentially zero, then the intervention analysis model fits the data.

MH First Admissions. Figure 8 contains the raw data plots of MH first admissions for all three groups. Group One is the group of counties which were the first to join the PACT program. Group Two consists of those counties which joined the PACT program on October 1, 1979. Group Three includes those counties which did not join the program by the end of FY 1980. There appears to be a drop in the series near the time of the interventions, so the pre-intervention portion of each series is used to identify, estimate and diagnose a model for each series. See Appendix A for the computer output from the model identification, estimation and diagnosis steps.

Group One's ACFs were effectively zero, as were the PACFs, indicating a white noise model -- ARIMA (0,0,0). The mean for the pre-intervention series was 52.67. Neither the first intervention component,



LEGEND * Group One ◊ Group Two x Group Three

FIGURE 8: Raw data plot of MH first admissions.

nor the second was significant. The t for Intervention 1(I1) was t(81)=-0.82 and t(81)= 0.17 for I2.

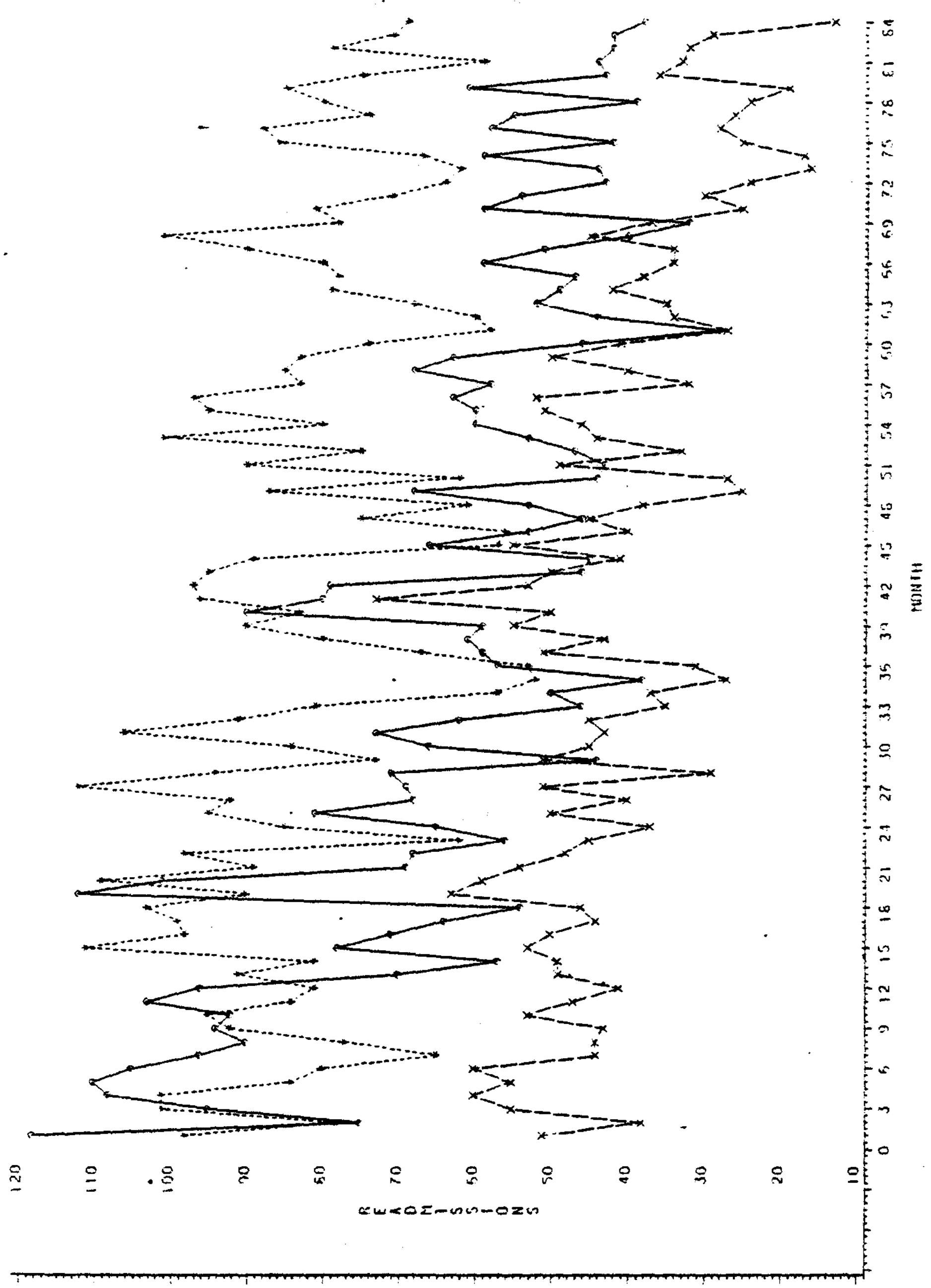
The Group Two series contained trend, or drift, and needed to be differenced once. The identified model was a moving average model of the first order, ARIMA (0,1,1). Neither one of the interventions were significant. The first intervention had a t(80)=-0.72 and the second intervention had a t(80)= 0.95.

The third group's ACFs and PACFs were effectively zero, indicating the pre-intervention series was random or white noise -- ARIMA (0,0,0). The first intervention, I1, was significant, with a t(81)=-5.08. The second intervention, I2, was not significant, t(81)=-0.15.

Note that the degrees of freedom are not the same for all groups. This is because different models are fit to each group. Groups 1 and 3, for example, have 81 degrees of freedom because there were no autoregressive or moving average components in their models and no differencing was required - ARIMA(0,0,0). Group Two has 80 degrees of freedom because it had to be differenced once - ARIMA(0,1,0).

MH Readmissions. Figure 9 displays the raw data plots of MH readmissions for Group One, Group Two and Group Three. The pre-intervention series are used for model identification, estimation and diagnosis. Appendix A contains the computer output from these steps.

All of the groups in MH readmissions had a regular or seasonal trend. The Group One series had a linear trend and was differenced once to get a stationary series. An ARIMA (0,1,1) (first order moving aver-



LEGEND * Group One ◇ Group Two x Group Three

FIGURE 9: Raw data plot of MH readmissions.

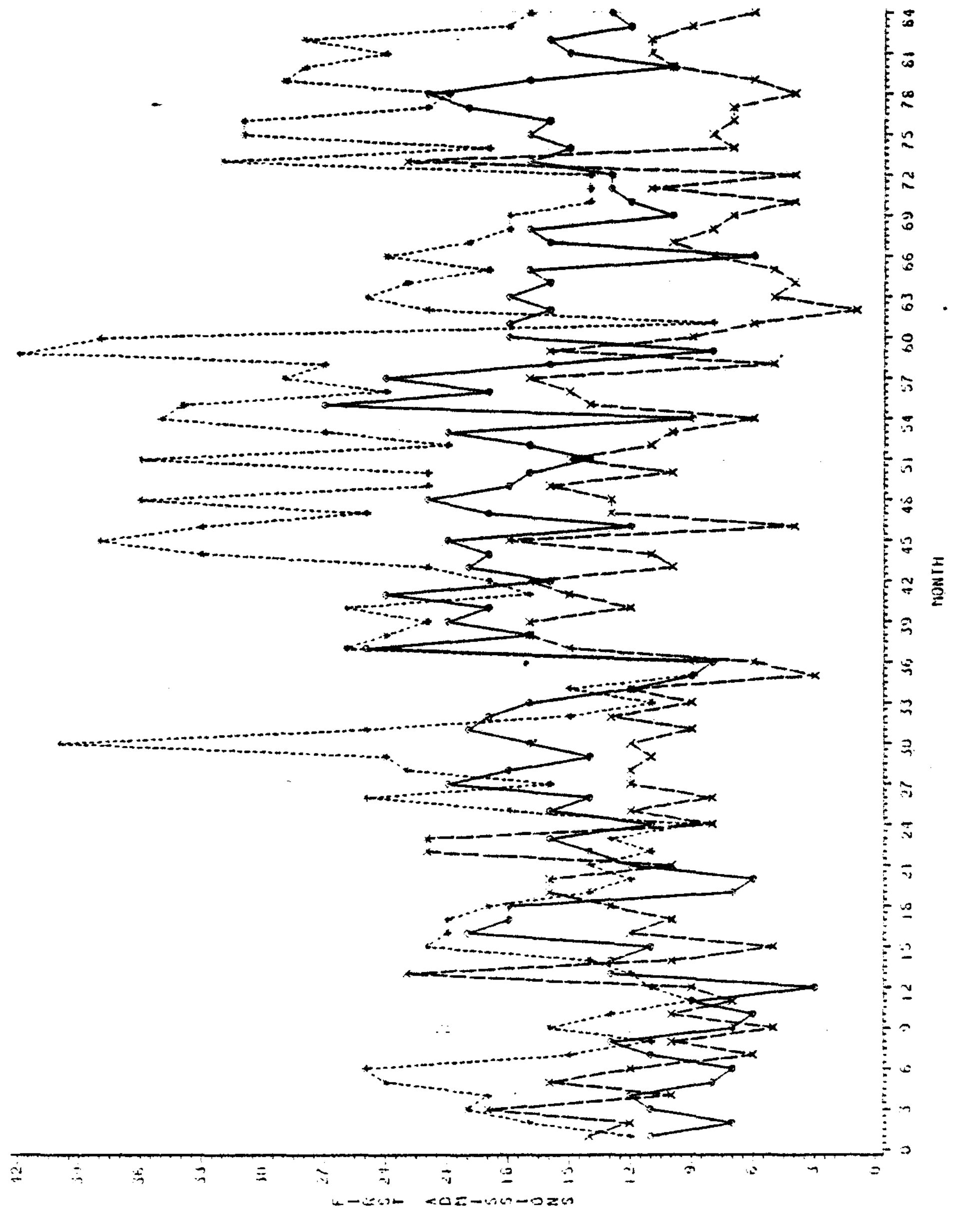
age) model fit the data. Neither intervention was significant. At I1, *t*(80)= 0.03. At I2, *t*(80)= 0.30.

The Group Two series had a seasonal trend which was "removed" by one seasonal differencing. An ARIMA (1,0,0)(1,1,0) (first order autoregressive model, seasonally differenced, with a seasonal first order autoregressive component) model fit the data. Neither intervention was significant. I1 had a *t*(54)= 1.55, while I2 had a *t*(54)=-0.43.,

Group Three had a linear trend and was differenced once before a model was identified and fit to the pre-intervention series. The model was a first order moving average model, ARIMA (0,1,1). Neither intervention was significant. I1 had a *t*(80)= 0.39 and I2 had a *t*(80)= 0.56.

Alcohol and Drug First Admissions. Figure 10 displays the raw data plots for all three groups in alcohol and drug (AD) first admissions. Group One in AD first admissions contained a trend and was differenced once. An ARIMA (0,1,1) (first order moving average) model fit the data. Neither intervention was significant. I1 had a *t*(80)=-0.83 and I2 had a *t*(80)= 1.04.

Group Two also had a linear trend and, therefore, was differenced once. A first order moving average model fit the differenced series -- ARIMA (0,1,1). Interventions 1 and 2 were significant and reduced the moving average parameter estimate when they were added to the model, from .6751 for the pre-intervention series to .5419 for the entire series with the intervention components in the model. The first



LEGEND * Group One ◇ Group Two x Group Three

FIGURE 10: Raw data plot of AD first admissions.

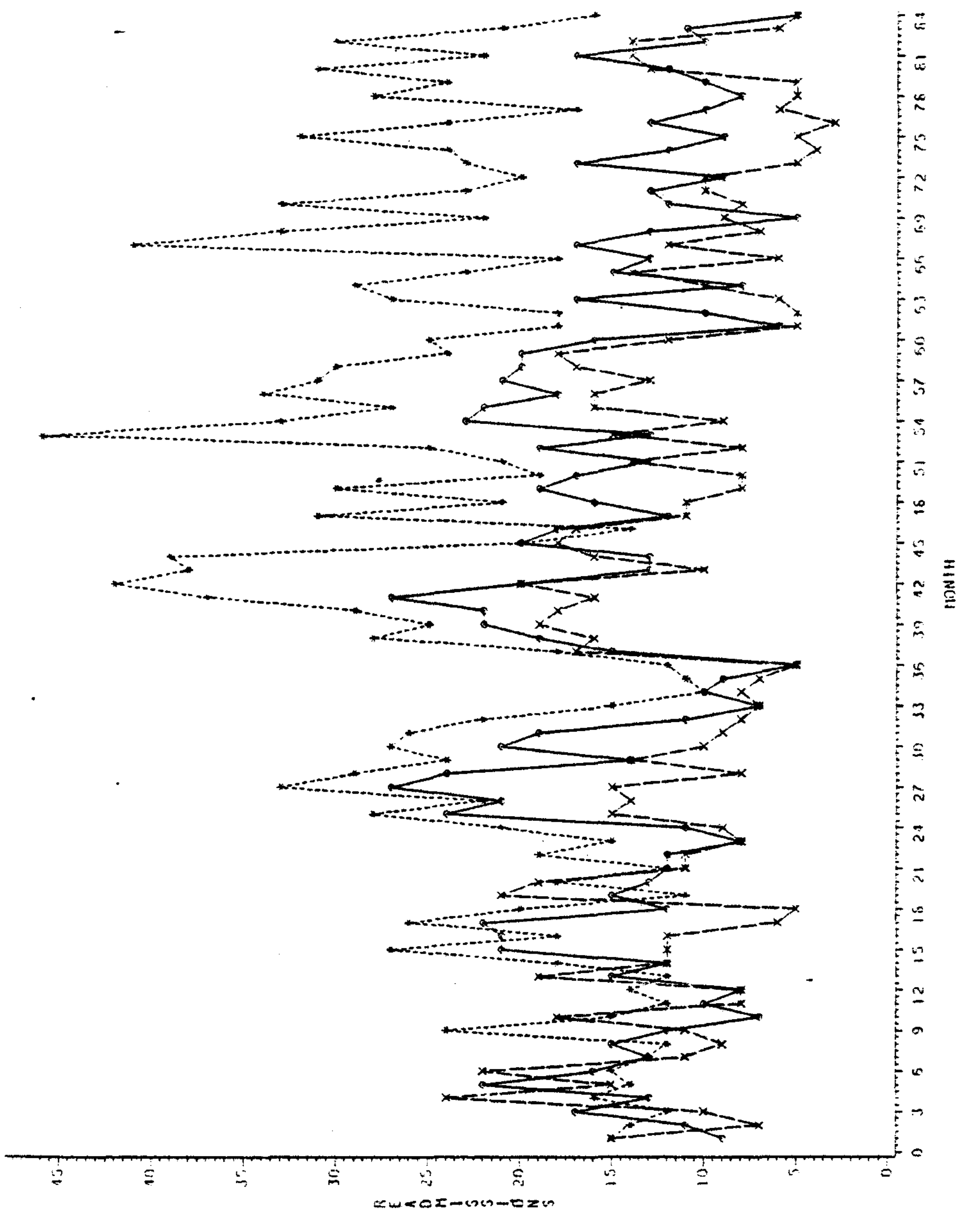
intervention component, I1, had a $t(80)=-3.56$. I2 was significant, but positive, with a $t(80)= 2.33$.

The Group Three series in AD first admissions was a white noise series -- ARIMA (0,0,0). The mean was 10.3690 before the intervention components were added to the model and 11.6667 after they were added to the model. The first intervention, I1, was significant,$t(81)=-4.76$. The second intervention, I2, was not significant,$t(81)= 1.37$.

Alcohol and Drug Readmissions. All three groups' raw data were plotted (see Figure 11) to determine whether only the pre-intervention series should be used to identify a model. The pre-intervention series of Group One contained a linear trend, so the series was differenced once. After differencing, the ACFs and the PACFs behaved like white noise. An ARIMA (0,1,0) model was identified, estimated and diagnosed for Group One. The first intervention component was significant, $t(80)=-1.92$. The second intervention component was not significant, $t(80)= 1.54$.

Group Two's pre-intervention series also needed to be differenced once. A first order moving average model was fit to the differenced data -- ARIMA (0,1,1). The parameter estimate was .4666 for the pre-intervention series and was .5133 when the intervention components were added to the model. Neither intervention was significant. I1 had a $t(80)=-0.96$ and I2 had a $t(80)= 0.17$.

The pre-intervention series for Group Three was white noise, ARIMA (0,0,0). The mean was 12.4127 before the intervention components were added and did not change after they were added. The first intervention



LEGEND * Group One ◇ Group Two x Group Three

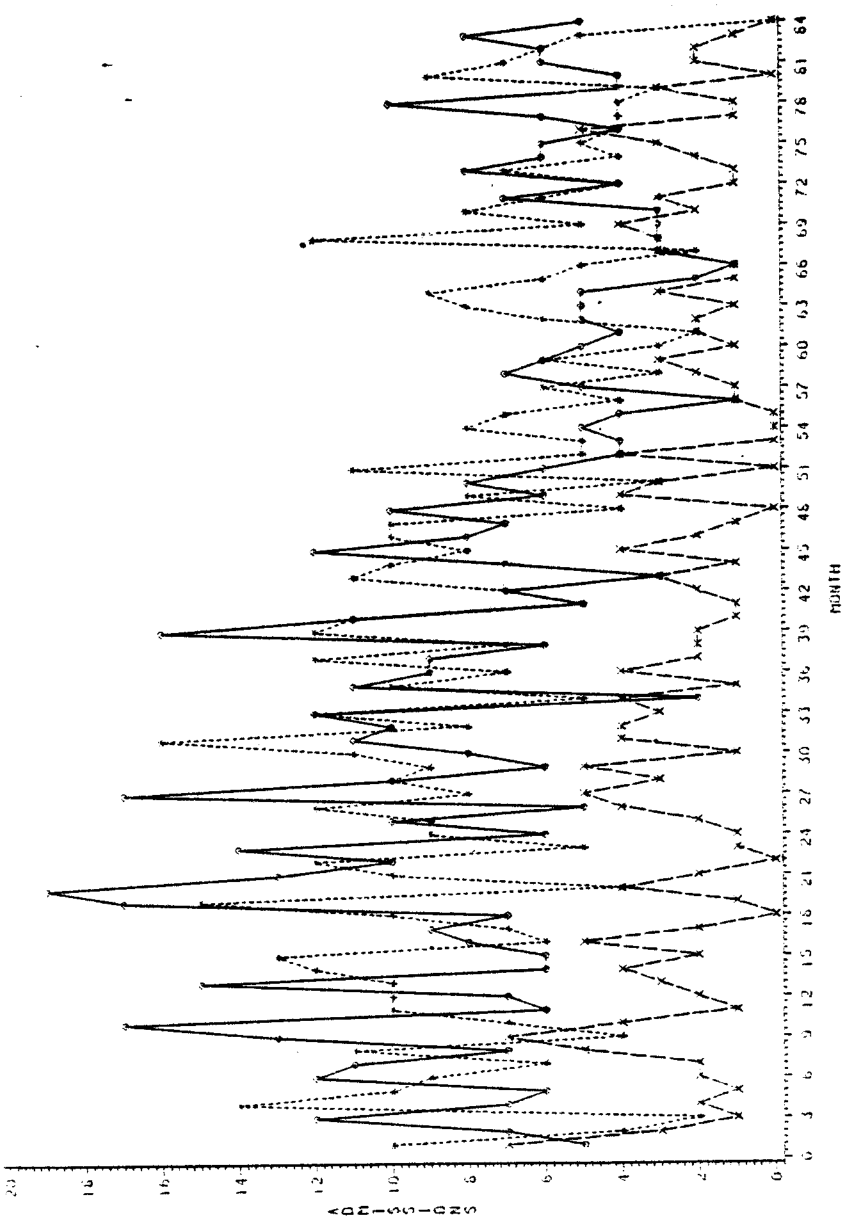
FIGURE 11: Raw data plots of AD readmissions.

component was significant, t(81)=-1.77. The second intervention was not significant, having a t(81)=-1.24.

YRC Admissions. A linear trend was present in the Group One YRC admissions series. One differencing made the series stationary. A first order moving average model was fit to the series -- ARIMA (0,1,1). The moving average parameter estimate was .8648 for the pre-intervention series and .8656 when the intervention components were added to the model. Neither intervention was significant. I1 had a t(80)=-0.80 and I2 had a t(80)= 0.60.

Group Two also had a linear trend and was differenced once. Figure 12 suggests that linear trend is present in Group One and Group Two. Like Group One, an ARIMA (0,1,1) model was identified, estimated and diagnosed for Group Two. The parameter estimate for the pre-intervention series was .8854. When the interventions were added to the model the estimate was .8866, but neither intervention was significant. I1 had a t(80)= 0.17 and I2 had a t(80)=-0.82.

The Group Three series was white noise -- an ARIMA (0,0,0) model. The mean was 2.2500 without the interventions added to the model and 2.3333 with the interventions added. Neither intervention was significant. I1 had a t(81)=-0.17 and I2 had a t(81)=-0.83.



LEGEND * Group One ◇ Group Two x Group Three

FIGURE 12: Raw data plot of YRC admissions.

Summary

Table 10 and Table 11 summarize the results of this study. The first column of the table lists the mean of the series if the series was white noise. These numbers are typically larger than 1. The first three groups, for example, are all white noise series and have means of 52.6667, 71.8413 and 35.4603, respectively. The numbers smaller than 1 in the first column are estimates of the phi or theta estimates or, for a differenced white noise series, estimates of the trend in the series. Only Group One in AD readmissions was a differenced white noise series. The standard error of the estimate appears in the second column of numbers. The third column contains the t-value of the parameter tested against zero. The last two columns of the table list the t-value of the first and then the second interventions for each group.

Note that in Table 10 the parameter estimates listed are those obtained after the intervention components are added. The estimates are often different before the intervention components are added to the model, as mentioned above in the presentation of the data for the various groups. In order to get an accurate parameter estimate each series had to be recalculated with only the significant parameters included. A non-significant intervention component, for example, would not be included in the model specification when final estimates are desired. Table 11 displays the final parameter estimates.

TABLE 10

Parameter Estimates and Tests of the Estimates

		Mean or Parameter	Stan. Error	Parameter t-value	I1 t-value	I2 t-value
MH 1st	Group 1	52.6667	1.3266	39.70*	-0.68	0.17
	Group 2	71.8413	1.9017	37.78*	-1.35	1.36
	Group 3	35.4603	.8829	40.16*	-5.08*	-0.15
MH Re	Group 1	.7216	.0767	9.40*	0.03	0.30
	Group 2	.3869	.1177	3.29*	-0.03	-0.71
		-.3710	.1177	-3.15*		
	Group 3	.6103	.0907	6.73*	0.39	0.56
AD 1st	Group 1	.8417	.0597	14.09*	-0.83	1.04
	Group 2	.5419	.0962	5.63*	-3.56*	2.33*
	Group 3	11.6667	.4792	24.35*	-4.76*	1.37
AD Re	Group 1	-.0370	.5764	-0.06	-1.72*	1.54
	Group 2	.5158	.0980	5.26*	0.55	0.16
	Group 3	12.4127	.5691	21.81*	-1.77*	-1.24
YRC	Group 1	.8656	.0553	15.64*	-0.80	0.60
	Group 2	.8866	.0543	16.33*	0.17	-0.82
	Group 3	2.3333	.2010	11.61*	-0.17	-0.83

*p<.05

TABLE 11

Final Parameter Estimates

		Mean or Parameter	Stan. Error	Parameter t-value	I1 t-value	I2 t-value
MH 1st	Group 1	52.1905	1.1388	45.83*	-	-
	Group 2	71.2024	1.6498	43.16*	-	-
	Group 3	35.4603	.8776	40.41*	-6.50*	-
MH Re	Group 1	.7266	.0746	9.74*	-	-
	Group 2	.4027	.1130	3.56*	-	-
		-.3683	.1156	-3.19*	-	-
	Group 3	.6332	.0864	7.33*	-	-
AD 1st	Group 1	.8338	.0588	14.18*	-	-
	Group 2	.5419	.0962	5.63*	-3.56*	2.33*
	Group 3	11.6667	.4818	24.22*	-5.04*	-
AD Re	Group 1	.0610	.5779	0.11	-1.72*	-
	Group 2	.5125	.0959	5.34*	-	-
	Group 3	12.4128	.5709	21.74*	-3.74*	-
YRC	Group 1	.8525	.0543	15.70*	-	-
	Group 2	.8817	.0507	17.39*	-	-
	Group 3	2.2500	.1735	12.97*	-	-

*p<.05

Post-Hoc Analyses

Post-hoc analyses are presented in this section, including the testing of a third intervention at the beginning of FY 1979. Several State Hospital alcohol treatment units were either closed or the number of beds were reduced at that time. An inspection of the MH raw data plots also indicated a drop in MH admissions at the beginning of FY 1979.

Another post-hoc analysis involved combining MH first time admissions and MH readmissions into total MH admissions for each fiscal year. Alcohol and drug first time admissions and AD readmissions were also combined to get fiscal year total AD admissions. Total MH admissions and total AD admissions were plotted, models were fit to the data, and the interventions were tested to see if there were any differences in how many and/or which interventions were significant for each group in MH and AD total admissions.

The Third Intervention

The first post-hoc analysis involved testing a third intervention, I3. I3 was a binary (0,1) series that changed from 0 to 1 at the beginning of FY 1979. This was three months prior to the first PACT intervention, I1. Although McCleary and Hay (1981) warn that multiple interventions should have a sufficient number of time periods between them (in this case, 12 months), it was obvious that a drop took place in mental health admissions for several groups at the beginning of FY 1979. I3 was tested to determine whether it would replace I1 or I2 as a significant intervention component or become the significant component where there previously was none.

MH First Admissions-Testing the Third Intervention. I3 was tested in all three MH first admissions groups. Table 12 displays the parameter estimates, the standard errors and the t-values for each group. Group One had only one significant parameter, the mean of the white noise series, with a $t(80)=38.46$, $p<.05$.

Group Two, in contrast, had two significant parameters, the first order moving average parameter of the differenced series ($t(79)=10.32$, $p<.05$) and I3 ($t(79)=-2.91$, $p<.05$). Group Three was similar to Group Two in that its mean was significant ($t(80)=44.21$, $p<.05$) and I3 was significant ($t(80)=-4.32$, $p<.05$). When I3 was not included as a parameter for Group Three, then the I1 intervention component was significant with a $t(81)=-5.08$, $p<.05$.

TABLE 12

MH 1st Admissions - Testing the Third Intervention

		Mean or Parameter	Stan. Error	t-value	
Group 1	White Noise	52.6667	1.3266	39.70*	
	I1	-2.2500	3.3174	-0.68	df=81
	I2	0.8055	4.6404	0.17	
	White Noise	52.5000	1.3652	38.46*	
	I1	-5.5833	6.8260	-0.82	df=80
	I2	0.8056	4.6623	0.17	
	I3	3.5000	6.2553	0.56	
Group 2	Moving Avg.	.7995	.0745	10.74*	
	I1	-7.0940	9.8193	-0.72	df=80
	I2	9.0635	9.5322	.95	
	Moving Avg.	.7747	.0751	10.32*	
	I1	8.2901	10.3734	0.80	df=79
	I2	8.8099	9.3366	0.94	
	I3	-30.6790	10.5593	-2.91*	
Group 3	White Noise	35.4603	.8829	40.16*	
	I1	-11.2103	2.2071	-5.08*	df=81
	I2	-0.4722	3.0948	-0.15	
	White Noise	36.2333	.8197	44.21*	
	I1	4.2500	4.0970	1.04	df=80
	I2	-0.4722	2.7948	-0.17	
	I3	-16.2333	3.7562	-4.32*	

*$p < .05$

MH Readmissions-Testing the Third Intervention. As with MH first admissions, MH readmissions data were tested with I3 added as another component. I3 was significant for only one of the three groups, Group Two.

Group One's only significant parameter was its first order moving average parameter, $t(79)=9.69$, $p<.05$. The I3 parameter was negative, but was only near significance ($t(79)=-1.64$, $p>.05$). Group Three's only significant parameter was the first order moving average parameter of the differenced series with a $t(79)=6.97$, $p<.05$. Again, I3 was negative and near significance ($t(79)=-1.67$, $p>.05$).

Table 13 displays the results of the post-hoc analysis for all three MH readmissions groups. Group Two had three significant parameters -- the first order autoregressive parameter ($t(54)=3.29$, $p<.05$), the seasonal first order autoregressive parameter ($t(54)=-2.55$, $p<.05$) and the I3 parameter ($t(54)=-2.10$, $p<.05$).

TABLE 13

MH Readmissions -- Testing the Third Intervention

		Mean or Parameter	Stan. Error	t-value	
Group 1	Moving Avg.	.7216	.0767	9.40*	
	I1	.2489	9.7447	.03	df=80
	I2	2.9444	9.6824	.30	
	Moving Avg.	.7331	.0757	9.69*	
	I1	6.6473	10.2743	.65	df=79
	I2	2.7178	9.4254	.29	
	I3	-16.7993	10.2389	-1.64	
Group 2	Autoreg. 1	.3869	.1177	3.29*	
	Autoreg. 12	-0.3710	.1177	-3.15*	df=55
	I1	-0.1317	5.1639	-0.03	
	I2	-5.5689	7.8539	-0.71	
	Autoreg. 1	.3829	.1650	3.29*	
	Autoreg. 12	-0.2905	.1140	-2.55*	
	I1	13.9370	8.9728	1.55	df=54
	I2	-3.0824	7.1560	-0.43	
	I3	-19.0298	9.0570	-2.10*	
Group 3	Moving Avg.	.6103	.0907	6.73*	
	I1	2.8303	7.2012	.39	df=80
	I2	4.0018	7.2001	.56	
	Moving Avg.	.6255	.0897	6.97*	
	I1	5.4623	7.2088	.76	df=79
	I2	3.8607	7.0345	.55	
	I3	-11.9884	7.1947	-1.67	

*$p < .05$

AD First Admissions-Testing the Third Intervention. Table 14 contains the parameter estimates, the standard errors and the t-values for all parameters in all three AD first admissions groups. The addition of I3 did not change the significance of any of the parameters, except that when I3 was added to the model for Group Three, the I1 intervention was no longer significant.

I3 was not significant in any of the three groups. In Group One, however, the I3 parameter was negative and approached significance ($t(79)=-1.73$, $p<.10$).

AD Readmissions-Testing the Third Intervention. Unlike many of the other groups discussed above, I3 was significant for two of the three AD readmissions groups. Table 15 compares the parameter estimates, standard errors, and t-values for each group's parameters with and without I3.

Group One's only significant parameter was I3 with a $t(79)=-1.97$, $p<.05$. The I3 component was not significant in Group Two, although it was negative ($t(79)=-1.06$, $p>.05$). The only significant parameter in Group Two was the first order moving average parameter for the differenced series ($t(79)=5.41$, $p<.05$).

Group Three had a significant mean for the white noise series ($t(80)=22.88$, $p<.05$) and a significant I3 component ($t(80)=-2.91$, $p<.05$).

TABLE 14

AD 1st Admissions - Testing the Third Intervention

		Mean or Parameter	Stan. Error	t-value	
Group 1	Moving Avg.	.8417	.0597	14.09*	
	I1	-2.0299	2.4596	-0.83	df=80
	I2	2.5952	2.5014	1.04	
	Moving Avg.	.8327	.0638	13.05*	
	I1	1.1710	3.0442	.38	df=79
	I2	2.6849	2.5279	1.06	
	I3	-5.3278	3.0786	-1.73	
Group 2	Moving Avg.	.5419	.0962	5.63*	
	I1	-20.1624	5.6662	-3.56*	df=80
	I2	13.0391	5.5922	2.33*	
	Moving Avg.	.6172	.0905	6.82*	
	I1	-19.6814	5.4030	-3.64*	df=79
	I2	12.2586	5.2586	2.33*	
	I3	5.6104	5.3742	1.04	
Group 3	White Noise	11.6667	.4792	24.35*	
	I1	-5.5833	1.1738	-4.76*	df=81
	I2	2.0833	1.5154	1.37	
	White Noise	11.7544	.4927	23.85*	
	I1	-3.9170	2.4014	-1.63	df=80
	I2	2.0834	1.5188	1.37	
	I3	-1.7541	2.2036	-0.80	

*$p < .05$

TABLE 15

AD Readmissions - Testing the Third Intervention

		Mean or Parameter	Stan. Error	t-value	
Group 1	White Noise	-0.0370	.5764	-0.06	
	I1	-8.9630	5.2196	-1.72	df=80
	I2	8.0370	5.2195	1.54	
	White Noise	.0852	.5699	0.15	
	I1	-9.0853	5.1288	-1.77	df=79
	I2	7.9147	5.1288	1.54	
	I3	-10.0853	5.1288	-1.97*	
Group 2	Moving Avg.	.5158	.0980	5.26*	
	I1	3.3678	6.1704	.55	df=80
	I2	.9952	6.2375	.16	
	Moving Avg.	.5342	.0987	5.41*	
	I1	4.3942	6.2032	.71	df=79
	I2	.8620	6.1598	.14	
	I3	-6.5567	6.2063	-1.06	
Group 3	White Noise	12.4127	.5691	21.81*	
	I1	-2.8568	1.6095	-1.77	df=81
	I2	-2.4731	1.9917	-1.24	
	White Noise	12.7667	.5580	22.88*	
	I1	4.2251	2.8815	1.47	df=80
	I2	-2.4742	1.9062	-1.30	
	I3	-7.4350	2.5571	-2.91*	

*$p < .05$

YRC Admissions-Testing the Third Intervention. None of the interventions were significant for the YRC admissions. The t-values for I3 in all three groups were all less than 1.00. Table 16 shows the parameter estimates, standard errors and t-values for all three groups, with and without the third intervention.

Group One's and Group Two's first order moving average parameters were the only significant parameters. The t-value for Group One's moving average parameter was 15.63, $p<.05$, with 79 df, while $t(79)= 14.96$, $p<.05$. The mean of Group Three's white noise series was 2.33 and had a $t(80)=11.46$, $p<.05$.

TABLE 16

YRC Admissions - Testing the Third Intervention

		Mean or Parameter	Stan. Error	t-value	
Group 1	Moving Avg.	.8656	.0553	15.64*	
	I1	-1.4517	1.8165	-0.80	df=80
	I2	1.0942	1.8387	.60	
	Moving Avg.	.8722	.0558	15.63*	
	I1	-0.7839	2.2630	-0.35	df=79
	I2	1.1387	1.8237	.62	
	I3	-1.0454	2.3213	-0.45	
Group 2	Moving Avg.	.8866	.0543	16.33*	
	I1	-1.2781	1.5561	-0.82	df=80
	I2	.2770	1.5902	.17	
	Moving Avg.	.8964	.0599	14.96*	
	I1	.8388	2.0128	.42	df=79
	I2	-1.2967	1.5299	-0.85	
	I3	-0.9806	2.2918	-0.43	
Group 3	White Noise	2.3333	.2010	11.61*	
	I1	-0.0833	.5031	-0.17	df=81
	I2	-0.5833	.7040	-0.83	
	White Noise	2.3667	.2066	11.46*	
	I1	.5833	1.0330	.56	df=80
	I2	-0.5833	.7056	-0.83	
	I3	-0.7000	.9467	-0.74	

*$p < .05$

Analysis of Total MH Admissions and Total AD Admissions

Another set of post-hoc analyses were done on total MH admissions and on total AD admissions. First admissions and readmissions for each population (MH and AD) were combined to learn whether the overall admissions for each group would present smoother series. If this were true then the interventions would be less likely to effect drops in the iombined MH admissions series or the combined AD admission series.

Total MH Admissions. Combining MH first admissions and MH readmissions produced a different pattern of results. When only the I1 and I2 interventions were included. Group One had no significant components and only Group Two's first order autoregressive component was significant ($t(79)=-3.41$, $p<.05$). Group Three's mean was significant ($t(81)=44.97$, $p<.05$) and the I1 component was significant ($t(81)=-5.77$, $p<.05$).

When I3 was added, however, neither I1 nor I2 were significant in any of the three MH groups. Group One, again, had no significant parameters. Group Two's first order autoregressive parameter was significant ($t(78)=-4.01$, $p<.05$) as well as the third intervention ($t(78)=-3.05$, $p<.05$). Group Three's mean was significant ($t(80)=48.38$, $p<.05$) and the I3 component was significant ($t(80)=-3.88$, $p<.05$).

TABLE 17

Total MH Admissions

		Mean or Parameter	Stan. Error	t value	
Group 1	White Noise	-1.3704	2.2823	-0.60	
	I1	-16.6296	20.6667	-0.80	df=80
	I2	30.3704	20.6663	1.47	
	White Noise	-1.2751	2.3097	-0.55	
	I1	-16.7248	20.7813	-0.80	df=79
	I2	30.2751	20.7809	1.46	
	I3	-7.7249	20.7802	-0.37	
Group 2	Autoreg.	-0.3642	.1069	-3.41*	
	I1	24.4176	21.5813	1.13	df=79
	I2	.7581	22.0387	.03	
	Autoreg.	-0.4239	.1058	-4.01*	
	I1	24.2278	20.1350	1.20	df=78
	I2	1.6067	20.5782	.08	
	I3	-62.0838	20.3431	-3.05*	
Group 3	White Noise	80.7301	1.7950	44.97*	
	I1	-25.8968	4.4877	-5.77*	df=81
	I2	-4.3889	6.2810	-0.70	
	White Noise	82.1666	1.6982	48.38*	
	I1	2.8333	8.4898	.33	df=80
	I2	-4.3889	5.8009	-0.76	
	I3	-30.1666	7.7823	-3.88*	

*$p<.05$

Total AD Admissions. The results for total AD admissions were somewhat similar to those for total MH admissions. When only I1 and I2 were tested, Group Two had no significant components. Group One only had a significant first order autoregressive component ($\underline{t}(79)=-3.67$, $\underline{p}<.05$). Group Three was the only group that had a significant intervention component, the I1 intervention, with a $\underline{t}(81)=-3.19$, $\underline{p}<.05$. Group Three's mean also was significant ($\underline{t}(81)=25.64$, $\underline{p}<.05$).

When I3 was added to the model for each group there was no change in Group One. Its only significant component remained the first order autoregressive parameter. Group Two, which had no significant components previously, now had a significant I3 component. The $\underline{t}$-value was negative and significant, as Table 18 shows.

The I1 component in Group Three was no longer significant when the third intervention was added. Group Three's mean was still significant, but the added I3 component was negative and significant, $\underline{t}(80)=-3.79$, $\underline{p}<.05$.

TABLE 18

Total AD Admissions

		Mean or Parameter	Stan. Error	t-value	
Group 1	Autoreg.	-0.3820	.1045	-3.67*	
	I1	-5.3236	7.3324	-0.73	df=79
	I2	2.9997	7.3066	.41	
	Autoreg.	-0.3787	.1056	-3.59*	
	I1	-5.3707	7.3432	-0.73	df=78
	I2	2.9997	7.3163	.41	
	I3	-7.3505	7.3302	-1.00	
Group 2	White Noise	.1676	1.2532	.13	
	I1	-0.1677	11.3389	-0.01	df=80
	I2	-8.1677	11.3387	-0.72	
	White Noise	.6338	1.1774	.54	
	I1	-0.6338	10.5962	-0.06	df=79
	I2	-8.6338	10.5962	-0.81	
	I3	-37.6338	10.5965	-3.55*	
Group 3	White Noise	24.0635	.9387	25.64*	
	I1	-7.4802	2.3468	-3.19*	df=81
	I2	-0.8056	3.2849	-0.25	
	White Noise	24.8000	.8913	27.82*	
	I1	7.2500	4.4569	1.63	df=80
	I2	-0.8056	3.0438	-0.26	
	I3	-15.4667	4.0843	-3.79*	

*p<.05

Summary of Post-Hoc Analyses

The post-hoc testing of I3 and the combining of the first admissions and readmissions for MH and AD produced the following results for the interventions:

Mental Health 1st Admissions:

Group One: None of the interventions were significant.

Group Two: Only I3 was significant.

Group Three: Only I3 was significant.

Mental Health Readmissions:

Group One: None of the interventions were significant.

Group Two: Only I3 was significant.

Group Three: None of the interventions were significant.

Total MH Admissions:

Group One: None of the interventions were significant.

Group Two: Only I3 was significant.

Group Three: Only I3 was significant.

Alcohol & Drug 1st Admissions:

Group One: None of the interventions were significant.

Group Two: I1 and I2 were significant.

Group Three: None of the interventions were significant.

Alcohol & Drug Readmissions:

Group One: Only I3 was significant.

Group Two: None of the interventions were significant.

Group Three: Only I3 was significant.

Total Alcohol & Drug Admissions:

Group One: None of the interventions were significant.

Group Two: Only I3 was significant.

Group Three: Only I3 was significant.

Youth Rehabilitation Centers:

Group One: None of the interventions were significant.

Group Two: None of the interventions were significant.

Group Three: None of the interventions were significant.

These results are discussed in the next chapter.

CHAPTER V

DISCUSSION

Results from Chapter 4 are explained in terms of the hypotheses outlined in Chapter 3. Each of the admission groups -- MH first admissions, MH readmissions, etc. -- are discussed in turn, followed by an examination of the post-hoc analyses, and the pattern of the effects across groups. Conclusions as to whether the PACT program had a significant, consistent negative effect on State Hospital mental health admissions are drawn.

Finally, the results of the present study are compared to previous research with MH screening program studies that used time-series designs and analyses. Discrepancies between the present study's results and the results of past studies are discussed. New information contributed by the present study is highlighted.

Results Vs. Hypotheses

Each group's results are presented separately and are compared to the hypotheses or predictions for each group. Interventions I1 (October, 1978) and I2 (October, 1979) were tested first. The third intervention, the apparent drop in admissions near the beginning of FY 1979, was tested in the post-hoc analyses.

MH First Admissions

The results of the intervention analyses for MH first admissions did not support the hypothesis that PACT would significantly reduce first time admissions to Kansas State Mental Hospitals. As detailed in Chapter 3, if the above hypothesis were true, then the first PACT intervention, I1, would be significant with a negative sign for Group 1; the second intervention, I2, would be negative and significant for Group 2; and neither I1 nor I2 would be significant for Group 3.

Group 1 and Group 2 had no significant interventions, but Group 3 had a negative and large t-value for I1. Obviously some policy, or other artifact reduced State Hospital admissions from Group 3's counties, but did not affect the other counties. It is possible that the number of voluntary beds in the State Hospitals became severely restricted and that, rather than CMHC screening reducing the number of admissions, the screening requirement may have caused patients to use the legal system so that they could continue to have access to hospitalization. Circumventing the PACT system in this way was possible.

As an illustration, if court ordered admissions were increasing to the State Hospitals, then State officials would have to restrict or reduce the number of voluntary commitment beds. Kansas, as in many other states, requires that court ordered admissions must be accepted, while voluntary commitments are accepted as long as there are beds available. This situation, of the court ordered commitments superseding voluntary commitments, creates a circular problem. As court ordered commitments increase, the number of voluntary beds must be reduced.

persons who need to get into the State Hospital will learn that to do so, they must be admitted through the legal system. Patients who might have committed by the court, further reducing the number of voluntary beds available.

PACT admissions were typically voluntary. If the voluntary commitment option was closed to PACT patients, then it is likely that patients would seek other avenues to treatment and by-pass the CMHC screening process. The PACT interventions, therefore, would not have had an impact on reducing State Hospital admissions.

MH Readmissions

Hypotheses for MH readmissions were not supported. The general hypothesis was that if CMHC's prevent people from being hospitalized by treating them in the community, then PACT should have significantly reduced repeat admissions to the State Hospitals. The first PACT intervention, I1, should have been significant for Group 1, while I2 should have been significant for Group 2. Group 3 would have no significant interventions if the hypothesis were true. The results, however, are that none of the interventions were significant for any of the groups.

Although the fact that none of the interventions were significant for Group 3 was a positive finding, it means little if the appropriate interventions were not significant for the other groups. Again, the lack of voluntary beds may explain the no change situation. Another possibility is that the CMHC's may have actually been preventing more people from being hospitalized but a decline in hospital admissions was not the indicator variable. If CMHC's, for example, were actually seeing more clients since PACT started but that increase in "case finding" was not accompanied by an increase in hospital admissions, then PACT would be successful.

As pointed out in Chapter 1, the number of persons served in CMHC's has been climbing steadily from over 40,000 persons served in FY 1974 to almost 65,000 persons served in FY 1980. State Hospital admissions peaked in FY 1974 at approximately 4,750 persons, declining slowly through FY 1978 to less than 4,500 persons, and then dropped sharply in FY 1979 and FY 1980 to 3,666 persons and 3,636 persons, respectively.

AD First Admissions

If the PACT program alone was responsible for a drop in State Hospital admissions, then non-PACT admissions, such as AD first admissions, should not be affected by the initiation of the program. Specifically, neither one of the interventions were expected to be significant for any of the AD first admission groups. These hypotheses were not supported.

Group 1 behaved as expected -- there were no significant intervention components. The series did need to be differenced once, because of a linear trend, to make it stationary. Group 2 also had a linear trend, however, both interventions were significant. The first intervention was negative, resulting in a reduction of State Hospital admissions for Group 2, but the second intervention, I2, was positive. This suggests that something other than the PACT program reduced Group 2's AD first admissions, but that there was a rise in admissions the following year. It is possible that the rise in admissions was merely a reaction to the lower number of admissions the year before. We would expect, in other words, that if one year's admission rate was abnormally low, the next year's rate would be higher. These would be normal fluctuations and would not be due to the impact of the program. If the program had a lasting effect, we would expect the lower admission rate to continue for one or more years.

Group 3 also had a significant negative intervention component, I1, but I2 was not significant. Again, if SRS had implemented an across the board policy, then we would expect to see significant intervention components in all three groups, not just Groups 2 and 3. Even though not all of the interventions are significant, there is a similar pattern in all three groups. The first intervention has a negative *t*-value for all three groups and the second intervention has a positive *t*-value for all three groups.

The post-hoc analysis, testing the third intervention, was done to learn whether another factor, such as the closing of an alcohol treatment unit or reduction in the number of alcohol treatment beds, accounted for these seemingly inconsistent findings.

AD Readmissions

The hypotheses for AD readmissions were the same as for AD first admissions. AD readmissions should be unaffected by the PACT interventions. Intervention components, however, were significant in two groups.

The I1 component was negative and significant in Group 1. Group 2 had no significant intervention components. I1 was negative and significant for Group 3. All of the I1 components were negative for AD readmissions and two of the I2 components were positive. Only the I2 component in Group 3 did not follow the pattern of negative I1 components and positive I2 components found in AD first admissions.

Again, it appears that some other events were occurring, although they were not statewide. Each group of counties sent residents to each State Hospital, so local history could not be a likely alternative explanation. There is no consistent pattern in which particular groups of counties have one or more significant intervention components. The inconsistent pattern suggests that more than one factor is operating independently upon the three groups.

YRC Admissions

YRC admissions were not included in the PACT program, therefore, none of the intervention components for the three YRC groups should be significant. This hypothesis was supported. The results, however, of the AD first admissions and AD readmissions should have been the same. The discrepancy suggests that something unique to the AD treatment units occurred.

A likely explanation for the differences between the AD groups and the YRC groups is that the closing of an AD unit near the time of I1 would result in I1 being significant for the AD groups, while the physically separate YRC units might not have been affected by the administrative change. This explanation is weakened though by the fact that the I1 intervention was not significant for all of the AD first admissions and AD readmissions groups.

The Effect Pattern Across Groups

There was no consistency in the effect pattern across groups and populations. The first intervention was significant for the Group 1 counties only once and that was with the AD readmissions population, not the MH populations. The first intervention was significant for other groups for which it should not have been. If the I1 component had been significant for all of the groups and all of the populations studied, then the results could have been explained as being due to an across the board policy or administrative change at the State Hospitals. This, however, was not the case.

The I1 intervention component was significant for Group 3 admissions in three of the five populations studied -- MH first admissions, AD first admissions and AD readmissions. Although the I1 component is not significant for the two remaining populations, this may suggest that the counties in Group 3 were responding on their own to the PACT goals, even though they did not join the PACT program.

Clearly, the AD populations were responding to some change, whether it was PACT or a SRS policy change. The I1 component was significant for five out of a possible fifteen groups. Four of those groups were in the AD populations, evenly split between AD first admissions and AD readmissions.

The second intervention seems to have had no impact at all on State Hospital admissions, except in Group 2 of AD first admissions. The I2 component for the group, however, was positive, meaning that State Hospital admissions for that group significantly increased at that time. It seems that the second wave of PACT recruits did nothing to reduce State Hospital admissions from their counties.

Post-Hoc Analyses

The post-hoc analyses included testing a third intervention, I3, and testing all three interventions when first admissions and readmissions for MH and AD were combined.

Testing the I3 Intervention With First Admissions and Readmissions

The I3 intervention was tested because a noticeable drop appeared in the raw data plots of several groups three months before the PACT program began. Because this drop occurred at the beginning of a fiscal year, it suggested a policy change or closing of a unit, specifically, an alcohol and drug treatment unit. Often, state governments make changes at the beginning of a new fiscal year, rather than during a fiscal year.

Each of the three groups of counties was scattered across the state. No group was served by a single State Hospital. In fact, all three groups contained counties that were served by each of the three State Hospitals. The hypothesis, therefore, was that if a department-wide change had been implemented at the beginning of FY 1979 it would affect all three county groups. If an AD unit had been closed or reduced at even one of the State Hospitals, it would affect AD admissions in all three county groups. An across the board policy change or the closing of an AD unit, therefore, would result in the I3 intervention being significant for all groups or only for the AD groups, respectively. Each population's results are presented separately. The post-hoc analyses also are compared to the planned analyses for each group.

MH First Admissions. The results of he post-hoc analysis for this group did not support the hypotheses that there was either an across the board policy change that affected only alcohol admissions. If the former were true, then all three groups would have a negative, significant I3 component. If the latter were true, then the I3 component would not have been significant for any of the MH first admission groups.

Neither hypothesis was supported in the MH first admission groups. None of the interventions were significant for Group 1, but the I3 intervention was significant for Group 2 and Group 3. This suggests that neither hypothèsis was correct. Because the counties of each group are spread throughout the state, each group has a mixture of urban and rural counties, and each group is served by all three hospitals, a more complicated set of events than hypothesized must have taken place.

Comparing the post-hoc analysis of MH first admissions to the previous analysis, Group 1 had no significant intervention components in either analysis. Group 2 had no significant interventions when only I1 and I2 were tested, but the I3 intervention was significant in the post-hoc analysis. Group 3 had a negative, significant I1 intervention, but in the post-hoc analyses only the I3 component was significant.

MH Readmissions. The same hypotheses are not supported in the MH readmission groups. Group 1 and Group 3 had no significant interventions when I1, I2 and I3 were tested. Group 2, however, had a significant I3 component. When MH first admissions were tested, Group 2 also had a significant I3 component. It is possible that the Group 2 counties instituted their own policy change at the beginning of FY 1979. It is also unlikely that this occurred because the counties were diverse and their CMHC's were run independently.

There were no significant I1 or I2 components for any of the MH readmission groups in the planned analyses. The post-hoc analyses only yielded a significant I3 component for Group 2.

AD First Admissions. The I3 intervention was not significant for any of the AD first admission groups. This suggests that if there were any reductions in the number of alcohol treatment beds, the reductions were not significant. The only group that had significant intervention components was Group 2, where the I1 and the I2 components were significant.

Again, the hypotheses were not supported by the pattern of results in the AD first admission groups. There were only slight differences, however, between the planned analyses and the post-hoc analyses. Group 1 had no significant intervention components in either analysis. Group 2 had significant I1 and I2 components in both analyses. Only Group 3's results differed between the first analysis and the post-hoc analysis.

I1 was negative and significant for Group 3 in the first analysis, but none of the interventions were significant when the I3 component was added to the model in the post-hoc analysis. Typically, when one component replaces another it suggests that the replacement component was the "true change". When the addition of a component reduces the the intervention components, making them non-significant, it suggests that a trend was present, rather than a true intervention.

AD Readmissions. While the I3 intervention had not been significant for any of the AD first admission groups, it was a significant component in Group 1 and Group 3 of AD readmissions. I1 and I2 were not significant components for any of the groups. These mixed results do not support either one of the post-hoc hypotheses.

The I3 component replaced I1 as the significant intervention component in Groups 1 and 3, but there was no change in Group 2. None of the interventions were significant for Group 2 in the planned analyses and none were significant in the post-hoc analyses.

YRC Admissions. The YRC admissions groups were the only groups which behaved as predicted. The YRC patients were not included in the PACT program and, therefore, none of the PACT interventions should have been significant for the YRC groups. None of the interventions were significant in the planned analyses and none were significant in the post-hoc analyses. The results support the original hypotheses.

The YRC data lead one to believe that the physical isolation and administrative separation of each YRC unit from the rest of the State Hospital at which it was located may have contributed to the fact that the YRC admissions were totally unaffected by PACT and the other changes that may have been occurring, while the other non-PACT group, the AD admissions, seemed to be fluctuating.

Total MH and Total AD Admissions

Another set of post-hoc analyses was done to learn whether combining first admissions and readmissions would smooth out the series and change which components were significant. All three intervention components -- I1, I2 and I3 -- were tested for total MH admissions and for total AD admissions.

Total MH Admissions. When first admissions and readmissions were combined, Group 1 still had no significant interventions. Group 2 had a significant I3 intervention which was logical, since the I3 intervention was significant for both Group 2 - MH first admissions and Group 2 - MH readmissions. Group 3 in total MH admissions also had a significant I3 component. Group 3 in MH first admissions had a significant I3 component.

Combining MH first admissions and MH readmissions did not alter the results very much. The group that had no significant intervention components when it was separated into first admissions and readmissions also had no significant intervention components when they were combined. The I3 component was significant for Group 2 no matter how the data were combined, while the I3 component apparently was strong enough in Group 3 - MH first admissions to remain a significant component when Group 3 - MH readmissions was added.

Total AD Admissions. Very different results occurred when AD first admissions and AD readmissions were combined, in contrast to the MH data. Group 1 had no significant intervention components when first admissions and readmissions were summed. The I3 component was significant for Group 1, however, when AD readmissions data were considered on their own.

Again, unlike the MH data, when the three intervention components were tested with total AD admissions for Group 2, and intervention that had not been significant for either Group 2 - AD first admissions or Group 2 - AD readmissions was now the only significant intervention component. The I3 component was significant for Group 2 when AD first admissions and readmissions were combined, but was not significant for Group 2 when the two types of admissions were considered separately. I1 and I2 had been significant components for Group 2 when AD first admissions were tested. Group 2 - AD readmissions had no significant intervention components.

The Group 3 results for total AD admissions were more similar to the type of results obtained for total MH admissions. Group 3 - AD first admissions had no significant intervention components, while Group 3 - AD readmissions had a significant I1 component. When the two types of admissions were combined into total AD admissions, however, only the I3 intervention was significant.

Summary of Total Admissions Analyses

The third intervention component was the only significant intervention component for MH total admissions and for AD total admissions. Apparently, the PACT program did not have the intended effect -- reducing State Hospital admissions -- but some other action or policy change at the beginning of FY 1979 did. Even this conclusion, however, cannot be absolute. The third intervention was significant for Groups 2 and 3 when first admissions and readmissions were combined for the MH and for the AD populations. Group 1 in MH total admissions and AD total admissions had no significant interventions.

Why were the results for Group 1 different than the results for Group 2 and Group 3? It could be that Group 1, the first set of counties to volunteer for PACT, really were different from the rest of the counties. One would expect, however, that the first PACT intervention would be significant for Group 1. It appears that the PACT community screening program did not have the intended effect on admissions to State Hospitals.

Comparisons to Previous Research

How did the results from this study compare to other studies mentioned in Chapter 1? The majority of the studies reviewed in Chapter 1 concluded that the presence of CMHCs or screening programs did reduce State Hospital admissions. The present study did not find this to be true for Kansas. There may be several reasons for the difference in results.

First, this study specifically examined a CMHC screening program, while many of the studies reviewed in Chapter 1 tested the impact of CMHC openings or CMHC versus non-CMHC counties (Aanes & Tullos, 1976; Decker & Shealy, 1973; Doidge & Rodgers, 1976; Dyck, 1974; Gallagher, 1976; Kentsmith, Menninger, & Coyne, 1975; McInnes, Palmer, & Downing, 1964; Redlich & Kellert, 1978; Shaeffer, Schulberg, & Board, 1978; Siguel, 1974; Spearly, 1980; Windle, Bass, & Taube, 1974; Windle &

Scully, 1976). Two studies focused on crisis intervention programs in CMHCs (Delaney, Seidman, & Willis, 1978; Sundel, Rhodes, & Ferguson, 1978). Two other studies (Billings, 1978; Taylor & Brooks, 1980) were the only ones to test a CMHC screening program very similar to PACT. These screening studies were both done in the State of Vermont and had serious selection problems.

Methodology was the second major point of difference between the present study and those studies reviewed in Chapter 1. The Vermont screening studies, for example, used the three counties with the highest State Hospital admission rates in Vermont as their pilot test counties. A number of other studies had similar selection problems (Aanes & Tullos, 1976; Delaney, Seidman, & Willis, 1978; Gallagher, 1976; Shaeffer, Schulberg, & Board, 1978; Spearly, 1980; Windle & Scully, 1976).

These differences present several possiblilities that may explain the discrepancies in results. First, the majority of the studies examined what effect the presence or absence of CMHCs had on State Hospital admissions. It could be that the presence or absence of CMHCs has a strong effect on State Hospital admissions, while a special screening program in already established CMHCs does not noticeably reduce State Hospital admissions any further.

Second, most of the reviewed studies were limited to a single state, as this one was to Kansas. A possibility is that what worked in another state may not be appropriate for Kansas. Mental health services, for example, may be administered very differently in Kansas than in other states.

Third, the flaws mentioned above may have made the interventions in the other studies appear to be significant when they really were not reducing State Hospital admissions. The fact that so many of the studies had serious selection problems makes this a strong possibility.

Fourth, it seems likely that other events affecting the Kansas mental health system were occurring at the same time PACT was implemented. These other events may have made it impossible to detect any of the expected results. As an example, Luckey (1978) studied the effects of commitment laws on State Hospital admissions in Nebraska, using a time-series design. Nebraska changed its involuntary commitment procedure in the Spring of 1975, making it more difficult to commit persons to the Nebraska State Hospitals.

Luckey found that there was an increase in the percentage of persons who were referred from the legal system and that, initially, there was an increase in voluntary admissions and a decrease in involuntary admissions. Voluntary and involuntary admissions returned to their pre-law levels 20 months after the statute change. Finally, Luckey concluded that there was an increase in the "revolving door" phenomenon -- average length of stay and time between admissions decreased and readmissions increased. A similar event in Kansas could have masked the true effect of the PACT program on State Hospital admissions.

Finally, the indices used in the present study may not have been sensitive to changes due to PACT. If PACT had prevented State Hospital admissions from increasing, a very positive outcome, it would not be possible to ascertain this by simply scrutinizing State Hospital first admissions and readmissions. Measures of activity at the CMHC before and after PACT, in conjunction with admissions measures, may be more appropriate. Some suggestions for additional indices are offered in the next section.

Conclusions

Findings

The major finding of the present study, therefore, is that the CMHC-based PACT screening program had no significant impact on State Hospital admissions. There was no clear distinction between PACT and non-PACT groups when first admissions and readmissions were measured. Only the YRC control group behaved as expected.

These findings lead to the suggestion that Kansas and other states seriously question the value of special screening programs. Campbell (1969) and Riecken and Boruch (1974) recommend that social innovations be empirically tested before wholesale adoption of a program takes place. This prevents unnecessary expense and allows the discovery of interventions that truly help the needy. The PACT program, if it had been tested within a true experimental design, without the interference of other changes, may have actually been shown to have a large effect on State Hospital admissions. Pursuing programs without testing them is costly and prevents or delays programs that are effective from being tried.

The time-series design seemed well suited to the problem. Fluctuations in admissions may have been misinterpreted if a limited number of pre- and postintervention points had been selected and analyzed. The *t*-values for many of the intervention components were negative and could have been interpreted as significant effects if historical trends had not been taken into account by the time-series method.

Policy Implications

Community programs for the mentally ill need to be examined more carefully, as indicated by this study and the Windle - NIMH studies (Windle, Bass, & Taube, 1974; Windle & Scully, 1976). Although the PACT program was implemented in the participating counties, it did not reduce State Hospital admissions. The staff time and the money spent on the PACT program could have been used more effectively in another manner.

In addition, there is some suggestion that the limited availability of voluntary beds in State Hospitals may be a problem. Patients who require in-hospital treatment, but can only get into a State Hospital with a court order may learn to bypass the CMHC rather than use it. Persons who might be able to stay in the community with the help of the CMHC will go directly to the hospitals instead.

If the PACT program is continued in Kansas, administrators there may consider requiring all mental health patients to be screened by a CMHC before they can be admitted to a State Hospital. Courts, therefore, would only be able to commit a patient to the care of a CMHC. The CMHC, would decide where the patient would receive the best care. A review committee could monitor placement decisions to assure that persons needing hospitalization did receive it.

Future Research

Studies of CMHC-based screening programs could be expanded to measure whether persons are being served as close to their home community as possible, in addition to measuring whether State Hospital admissions are reduced by the programs. Indices that could be used include the number of persons being served each month by the CMHCs. If State Hospital admissions are not declining significantly, but the number of persons being seen by CMHC staff is increasing, this would be a desirable outcome of the screening program. Admissions to CMHC inpatient units may also be measured to see whether more severe cases were being treated in the home community. Admissions broken down by diagnoses would be particularly valuable for this question. Posavac (personal communication, 1982) points out, however, that diagnoses could be manipulated by staff to show success in a program.

If individual patients could be tracked through the mental health system, then length of stay, length of time between admissions and number of readmissions per person could be valuable in identifying the effects of a screening program. Reduced lengths of stay, longer times between admissions and fewer admissions per person would all be positive outcomes for a CMHC-based screening program.

Voluntary and involuntary admissions could be measured to determine whether the implementation of PACT did precipitate a change in these indices. Finally, if ratings of the appropriateness of the referral to a State Hospital could be obtained, then another possible impact of the screening program could be examined. If State Hospital admissions remain steady, but the percentage of appropriate referrals (more serious cases) increases, then the PACT program could be considered a success.

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APPENDIX A

COMPUTER PROGRAMS AND OUTPUT

The following is a listing of the card images submitted to the computer in order to plot the raw data, examine the ACFs and PACFs, test a tentative model, estimate its parameters and test the interventions. The cards and output are presented in the following order:

MH First Admissions
MH Readmissions
AD First Admissions
AD Readmissions
YRC Admissions
Total MH Admissions
Total AD Admissions

MH First Admissions

```
//L84SAL JOB (3084,028A,,10),'LUEGER',TIME=(0,30),CLASS=6
/*JOBPARM Q=FETCH,I
//STEP1  EXEC  BIMED,PROG=BMDP2T
//FT06F001 DD DSN=&&TEMP1,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD *
/ PRINT         PAGESIZE = 0.
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES FOR MH 1ST
                ADMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'.
/ VARIABLE      NAMES=SHAWNEE,JOHNSON,WYANDOT,SUNFLOW,
                SCENTRL, ECENTRL,COWLEY,AREA,COUNSEL,
                IROQUOIS,HPLAINS,
                KANZA,SEAST,MHINSTIT,FOURCO,BERTNASH,NEAST,
                SWEST,MIAMI,NCENTRL,PRAIRIE,FRANKLIN,
                LABETTE,CRAWFORD,SEDGWICK,CENTRAL,I1,I2,
                CLOSE,GROUP1,GROUP2,GROUP3,TOTAL.
                ADD = 4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS +
                         IROQUOIS + NEAST + SEAST + SUNFLOW
                         + NCENTRL.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY +
                         SCENTRL +  BERTNASH + ECENTRL +
                         FOURCO + COUNSEL
                         + SWEST +
                         CRAWFORD + PRAIRIE + CENTRAL
                         + KANZA.
```

```
                GROUP3 = SHAWNEE + LABETTE + MIAMI + AREA +
                         FRANKLIN.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT +
                         SUNFLOW + SCENTRL + ECENTRL +
                         COWLEY + AREA +
                         COUNSEL + IROQUOIS + HPLAINS +
                         + HPLAINS + KANZA + SEAST + MHINSTIT
                         + FOURCO + BERTNASH + NEAST +
                         SWEST + MIAMI + NCENTRL + PRAIRIE +
                         FRANKLIN + LABETTE + CRAWFORD +
                         SEDGWICK + CENTRAL.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
24 920 3 3 5 013 4 1 8 3 5 2 6 2 711 113 3 1 1 013 6 0 0 0
25 718 1 0 7 0 414 0 4 6 4 4 3 4 8 2 1 4 4 3 7 2 5 7 0 0 0
241321 1 2 1 113 2 0 8 3 610 3 411 5 2 5 5 0 4 211 8 0 0 0
221030 2 4 6 1 9 9 0 2 312 611 6 4 2 3 6 1 1 5 114 8 0 0 0
25 726 1 1 7 1 9 3 2 9 4 9 6 9 1 7 2 3 6 2 2 3 3 6 8 0 0 0
22 926 0 1 9 111 6 0 3 2 7 5 5 2 7 5 2 5 3 1 2 414 7 0 0 0
161014 3 5 9 0 8 6 311 2 3 9 7 5 8 4 2 4 1 2 2 210 2 0 0 0
12 518 1 3 5 212 6 3 6 4 614 9 9 7 2 6 5 2 0 3 224 6 0 0 0
151326 1 1 5 2 8 5 2 7 5 8 610 2 8 0 3 3 1 2 1 311 4 0 0 0
22 421 1 3 3 116 6 0 8 3 8 610 6 6 6 1 4 0 3 1 117 2 0 0 0
16 722 3 2 5 113 6 1 8 2 6 6 7 5 4 3 4 6 1 2 0 2 9 4 0 0 0
20 615 0 2 3 3 6 2 0 3 1 7 3 6 1 8 1 2 3 4 5 2 2 7 1 0 0 0
171720 1 6 4 0 4 6 0 3 4 7 3 3 3 7 3 6 4 3 3 4 314 4 0 0 0
211215 0 4 5 1 8 3 1 2 2 4 2 6 310 2 4 6 1 2 1 311 5 0 0 0
151726 2 2 4 114 7 0 9 0 3 3 5 4 6 3 1 5 4 0 2 019 7 0 0 0
242226 0 3 2 0 9 8 012 111 4 7 310 2 7 5 1 2 2 123 7 0 0 0
141229 3 2 6 3 5 9 0 4 3 613 7 1 8 0 5 6 4 3 1 317 6 0 0 0
201326 0 4 0 3 7 6 1 7 5 9 5 6 1 6 1 1 8 3 0 3 420 6 0 0 0
24 721 1 2 7 1 8 3 5 5 510 5 9 3 3 1 5 2 4 4 2 210 4 0 0 0
31 928 3 4 5 112 5 2 6 0 510 4 2 0 4 2 8 3 0 1 2 9 5 0 0 0
121213 1 3 7 011 3 1 9 4 9 8 3 1 7 3 1 4 2 3 2 4 9 5 0 0 0
161018 1 5 6 1 9 4 2 8 1 8 410 2 4 5 4 4 2 7 3 019 7 0 0 0
191018 2 3 5 114 8 0 2 011 4 7 1 6 2 1 5 2 3 4 011 7 0 0 0
18 828 0 4 3 012 5 0 4 2 6 3 6 1 8 4 0 4 1 3 3 014 5 0 0 0
221825 1 4 1 1 6 5 1 8 2 9 2 5 3 3 1 3 5 2 1 1 4 9 8 0 0 0
181131 1 3 6 0 6 1 112 1 8 7 8 2 4 0 1 3 3 0 4 0 7 4 0 0 0
21 922 1 2 1 0 7 6 3 3 3 8 4 4 2 5 3 3 5 0 2 2 1 9 5 0 0 0
151738 2 3 4 010 4 2 8 0 4 611 3 7 2 6 4 4 1 1 3 4 3 0 0 0
182144 1 1 4 3 9 8 2 2 4 3 513 1 8 0 4 6 1 0 4 5 3 3 0 0 0
192239 3 5 3 6 7 6 0 7 5 7 516 4 6 3 5 6 0 5 8 3 5 7 0 0 0
151226 4 8 4 0 8 2 312 5 7 3 7 2 6 1 3 5 3 1 8 416 7 0 0 0
222332 0 0 0 1 6 4 0 5 4 7 0 8 2 8 1 3 6 0 1 1 112 8 0 0 0
161220 1 0 4 1 7 4 1 2 1 3 3 1 5 3 1 0 7 1 3 0 014 7 0 0 0
261218 1 1 1 1 7 4 4 2 3 0 7 0 5 4 2 0 3 1 0 1 019 6 0 0 0
12 815 0 1 0 1 3 2 0 2 1 0 1 1 3 4 0 0 5 1 0 0 0 9 4 0 0 0
14 414 1 1 1 012 4 0 2 3 0 3 0 2 2 3 0 4 4 0 0 0 6 3 0 0 0
202848 0 3 5 4 8 3 1 5 2 9 2 5 6 2 1 6 6 1 0 2 6 4 4 0 0 0
```

```
181937 0 2 0 310 4 2 7 3 3 6 7 4 3 0 2 4 3 1 2 210 4 0 0 0
351921 0 2 2 512 3 1 6 2 8 2 510 8 1 4 6 1 1 2 315 3 0 0 0
182041 1 1 6 1 5 3 1 3 1 6 7 5 3 8 0 2 6 6 1 1 2 6 7 0 0 0
222228 1 1 3 112 2 2 3 3 7 5 5 2 7 1 5 4 2 3 3 2 9 4 0 0 0
221334 4 2 4 0 9 3 1 1 4 6 316 211 1 6 3 1 2 4 111 2 0 0 0
142229 2 1 5 2 9 4 3 2 3 9 711 3 7 0 4 0 1 3 6 2 5 6 0 0 0
191642 2 1 3 7 4 8 0 6 4 6 515 0 8 1 6 5 1 1 6 2 9 4 0 0 0
182748 2 8 3 211 6 2 8 517 710 312 2 5 4 1 4 2 7 8 3 0 0 0
142250 0 1 3 1 9 4 1 6 2 8 5 7 1 4 1 3 4 3 4 3 4 8 6 0 0 0
201122 0 4 5 2 423 2 9 52512 3 0 9 0 2 3 0 1 6 3 4 2 0 0 0
212543 0 3 5 4 7 5 2 1 111 411 1 9 1 3 3 1 5 3 7 6 8 0 0 0
271730 3 4 1 3 5 5 0 4 1 910 9 4 7 0 3 9 0 2 2 214 3 0 0 0
201525 0 1 3 4 4 4 0 4 3 9 4 3 5 8 4 4 1 1 3 0 220 3 0 0 0
231133 1 3 7 3 8 7 1 6 6 5 2 9 4 6 3 2 3 6 2 3 917 7 0 0 0
241439 0 3 5 4 410 1 3 2 6 2 4 2 7 0 2 4 0 2 2 219 0 0 0 0
221531 0 4 3 3 6 5 1 4 3 4 710 5 8 3 3 2 2 2 5 422 3 0 0 0
121529 0 1 5 2 910 2 2 2 5 8 5 4 4 3 4 6 0 1 4 418 1 0 0 0
262642 2 2 3 310 4 1 4 510 5 4 2 9 2 2 7 4 3 3 124 4 0 0 0
241429 1 3 3 415 6 2 6 5 5 7 4 510 2 111 0 3 2 414 8 0 0 0
181440 1 3 1 41510 2 7 4 3 2 6 511 2 4 9 1 4 1 319 4 0 0 0
231334 0 8 6 3 9 3 0 1 2 3 7 6 5 6 2 1 7 1 1 4 319 5 0 0 0
221046 0 6 6 310 6 0 9 5 41112 4 6 4 2 4 4 1 6 415 7 0 0 0
211937 1 4 7 0 3 4 1 7 5 4 3 7 6 4 2 5 3 4 3 2 514 4 0 0 0
112126 0 2 1 2 8 1 1 3 1 7 3 7 311 2 1 3 0 0 4 316 1 0 0 1
 41626 1 2 2 3 2 3 0 3 2 8 5 8 0 3 1 1 2 3 1 3 513 1 0 0 1
101632 0 4 5 1 6 5 2 4 3 6 3 8 1 8 0 3 5 0 2 4 319 0 0 0 1
111038 1 0 5 6 3 2 1 6 5 4 6 9 210 0 4 2 0 2 4 511 2 1 0 1
 81833 0 2 3 2 4 2 0 4 4 8 5 6 3 7 1 3 2 0 2 4 310 0 1 0 1
151928 0 1 1 3 8 3 0 4 6 9 8 9 3 9 1 3 5 1 0 0 1 7 1 1 0 1
171226 0 2 3 4 8 3 3 6 3 9 9 6 2 7 2 4 3 0 1 4 522 3 1 0 1
182123 2 3 3 0 6 1 1 5 5 3 7 3 410 0 1 5 3 1 3 425 3 1 0 1
 81627 2 2 1 2 4 7 0 1 1 5 911 2 8 3 3 1 3 1 5 215 2 1 0 1
101925 1 3 5 2 3 2 0 4 1 312 4 2 3 1 3 5 1 2 1 110 3 1 0 1
101621 1 3 5 2 4 2 0 6 3 4 4 8 1 6 0 5 6 1 2 3 2 5 1 1 0 1
 91928 2 1 5 2 4 2 1 6 3 5 3 6 1 5 0 1 1 0 1 2 114 1 1 0 1
171423 3 1 2 2 9 8 012 1 4 512 3 4 1 4 6 1 2 4 513 3 1 0 1
111220 0 2 3 3 6 6 1 4 0 2 3 8 111 3 3 3 2 2 2 2 2 1 1 0 1
 81435 1 4 5 2 418 1 5 0 7 3 8 4 7 1 1 3 1 2 1 2 5 4 1 0 1
111931 2 0 6 2 5 9 2 4 8 6 2 9 3 8 3 3 4 0 0 3 211 4 1 1 1
 62122 2 0 2 2 7 6 011 2 5 3 8 6 5 2 6 8 1 0 2 5 3 3 1 1 1
122438 3 3 3 1 3 6 0 7 2 2 6 6 5 3 3 3 3 1 1 0 5 9 2 1 1 1
12 931 0 1 2 5 313 2 4 317 714 1 9 1 4 6 4 1 4 715 1 1 1 1
161430 1 3 5 11112 0 6 5 7 7 6 4 4 2 5 2 0 1 2 115 2 1 1 1
141324 2 6 5 1 8 7 1 1 4 5 5 4 1 6 2 1 9 1 1 0 218 3 1 1 1
151538 1 3 1 3 718 110 2 5 6 5 2 6 0 2 6 3 0 2 412 3 1 1 1
16 824 1 2 3 01011 2 4 3 4 5 6 3 6 0 3 2 2 1 0 211 2 1 1 1
 41427 0 1 5 0 5 8 1 2 3 3 8 3 2 5 1 2 4 0 2 0 410 2 1 1 1
/ END
 TPLOT        VARIABLES ARE GROUP1, GROUP2, GROUP3.
              COMMON./
```

```
ACF          VARIABLE IS GROUP1.
             MAXLAG IS 25.
             TIME=1,63./
PACF         VARIABLE IS GROUP1.
             MAXLAG IS 25.
             TIME=1,63./
ARIMA        VARIABLE IS GROUP1.
             CONSTANT./
ESTIMATION   RESIDUAL IS RGROUP1.
             TIME=1,63./
ACF          VARIABLE IS RGROUP1.
             MAXLAG IS 25.
             TIME=1,63./
ERASE        MODEL./
ARIMA        VARIABLE IS GROUP1.
             CONSTANT./
INDEP        VARIABLE IS I1.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
INDEP        VARIABLE IS I2.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
ESTIMATION   RESIDUAL IS IGROUP1./
ACF          VARIABLE IS IGROUP1.
             MAXLAG IS 25./
ERASE        MODEL./
ARIMA        VARIABLE IS GROUP1.
             CONSTANT./
ESTIMATION   RESIDUAL IS IGROUP1./
ACF          VARIABLE IS IGROUP1.
             MAXLAG IS 25./
ERASE        MODEL./
ACF          VARIABLE IS GROUP2.
             MAXLAG IS 25.
             TIME=1,63./
PACF         VARIABLE IS GROUP2.
             MAXLAG IS 25.
             TIME=1,63./
ACF          VARIABLE IS GROUP2.
             DFORDER IS 1.
             MAXLAG IS 25.
             TIME=1,63./
PACF         VARIABLE IS GROUP2.
             DFORDER IS 1.
             MAXLAG IS 25.
             TIME=1,63./
ARIMA        VARIABLE IS GROUP2.
             DFORDER IS 1.
             MAORDER IS '(1)'./
ESTIMATION   RESIDUAL IS RGROUP2.
```

```
              TIME=1,63./
ACF           VARIABLE IS RGROUP2.
              MAXLAG IS 25.
              TIME=1,63./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./
INDEP         VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL IS IGROUP2./
ACF           VARIABLE IS IGROUP2.
              MAXLAG IS 25./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./
INDEP         VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS CLOSE.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL IS IGROUP2./
ACF           VARIABLE IS IGROUP2.
              MAXLAG IS 25./
ERASE         MODEL./
ACF           VARIABLE IS GROUP3.
              MAXLAG IS 25.
              TIME=1,63./
PACF          VARIABLE IS GROUP3.
              MAXLAG IS 25.
              TIME=1,63./
ARIMA         VARIABLE IS GROUP3.
              CONSTANT./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP3.
              CONSTANT./
```

```
 INDEP       VARIABLE IS I1.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
 INDEP       VARIABLE IS I2.
            -UPORDER IS '(0)'.
             TYPE IS BINARY./
 ESTIMATION  RESIDUAL IS IGROUP3./
 ACF         VARIABLE IS IGROUP3.
             MAXLAG IS 25./
 ERASE       MODEL./
 ARIMA       VARIABLE IS GROUP3.
             CONSTANT./
 INDEP       VARIABLE IS I1.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
 INDEP       VARIABLE IS I2.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
 INDEP       VARIABLE IS CLOSE.
             UPORDER IS '(0)'.
             TYPE IS BINARY./
 ESTIMATION  RESIDUAL IS IGROUP3./
 ACF         VARIABLE IS IGROUP3.
             MAXLAG IS 25./
 END /
//STEP2  EXEC SAS,OPTIONS='NOSOURCE'
//IN     DD DSN=&&TEMP1,DISP=(OLD,DELETE)
//OUT    DD DSN=&&TEMP2,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD DSN=L84SAL.SAS.CNTL(FIGURES),DISP=SHR
//STEP3 EXEC IEBGENER
//SYSUT1 DD DSN=&&TEMP2,DISP=(OLD,DELETE)
//SYSUT2 DD DSN=L84SAL.MH1ST,DCB=(RECFM=FB,LRECL=133,
    BLKSIZE=931),
//  DISP=(,CATLG,DELETE),SPACE=(TRK,(2,5),RLSE),UNIT=SYSTS,
//  LABEL=RETPD=120,VOL=SER=LD5010
//SYSIN  DD DUMMY
//
```

The output for the program listed above follows.

```
PAGE    1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
```

MANUAL REVISED -- 1981
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```
PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE = 0.
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES FOR MH
                1ST ADMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'.
/ VARIABLE      NAMES=SHAWNEE,JOHNSON,WYANDOT,SUNFLOW,
                SCENTRL,ECENTRL,COWLEY,AREA,COUNSEL,
                IROQUOIS,HPLAINS,KANZA,SEAST,MHINSTIT,
                FOURCO,BERTNASH,NEAST,SWEST,MIAMI,NCENTRL,
                PRAIRIE,FRANKLIN,LABETTE,CRAWFORD,
                SEDGWICK,CENTRAL,I1, I2, CLOSE,
                GROUP1,GROUP2,GROUP3,TOTAL.
                ADD = 4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS +
                         IROQUOIS + NEAST + SEAST +
                         SUNFLOW + NCENTRL.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY +
                         SCENTRL + BERTNASH + ECENTRL +
                         FOURCO + COUNSEL + SWEST +
                         CRAWFORD + PRAIRIE + CENTRAL +
                         KANZA.
                GROUP3 = SHAWNEE + LABETTE + MIAMI + AREA
                         + FRANKLIN.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT +
                         SUNFLOW + SCENTRL + ECENTRL +
                         COWLEY + AREA + COUNSEL + IROQUOIS
                         + HPLAINS + KANZA + SEAST +
                         MHINSTIT + FOURCO + BERTNASH +
                         NEAST + SWEST + MIAMI + NCENTRL +
                         PRAIRIE + FRANKLIN + LABETTE
                         + CRAWFORD + SEDGWICK + CENTRAL.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
PROBLEM TITLE IS
INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

NUMBER OF VARIABLES TO READ IN                          29
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS             4
TOTAL NUMBER OF VARIABLES                               33
NUMBER OF CASES TO READ IN                          TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS       NEITHER
BLANKS ARE                                         MISSING
INPUT UNIT NUMBER                                        5
REWIND INPUT UNIT PRIOR TO READING    DATA              NO
```

```
NUMBER OF WORDS OF DYNAMIC STORAGE                 45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT              1

***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 SHAWNEE      2 JOHNSON     3 WYANDOT     4 SUNFLOW
     5 SCENTRL      6 ECENTRL     7 COWLEY      8 AREA
     9 COUNSEL     10 IROQUOIS   11 HPLAINS    12 KANZA
    13 SEAST       14 MHINSTIT   15 FOURCO     16 BERTNASH
    17 NEAST       18 SWEST      19 MIAMI      20 NCENTRL
    21 PRAIRIE     22 FRANKLIN   23 LABETTE    24 CRAWFORD
    25 SEDGWICK    26 CENTRAL    27 I1         28 I2
    29 CLOSE       30 GROUP1     31 GROUP2     32 GROUP3
    33 TOTAL
INPUT FORMAT IS
(29F2.0)
MAXIMUM LENGTH DATA RECORD IS   58 CHARACTERS
I N P U T   V A R I A B L E S
```

VARIABLE INDEX	NAME	RECORD NO	COLUMNS BEGIN	END	FIELD WIDTH	TYPE
1	SHAWNEE	1	1	2	2	F
2	JOHNSON	1	3	4	2	F
3	WYANDOT	1	5	6	2	F
4	SUNFLOW	1	7	8	2	F
5	SCENTRL	1	9	10	2	F
6	ECENTRL	1	11	12	2	F
7	COWLEY	1	13	14	2	F
8	AREA	1	15	16	2	F
9	COUNSEL	1	17	18	2	F
10	IROQUOIS	1	19	20	2	F
11	HPLAINS	1	21	22	2	F
12	KANZA	1	23	24	2	F
13	SEAST	1	25	26	2	F
14	MHINSTIT	1	27	28	2	F
15	FOURCO	1	29	30	2	F
16	BERTNASH	1	31	32	2	F
17	NEAST	1	33	34	2	F
18	SWEST	1	35	36	2	F
19	MIAMI	1	37	38	2	F
20	NCENTRL	1	39	40	2	F
21	PRAIRIE	1	41	42	2	F
22	FRANKLIN	1	43	44	2	F
23	LABETTE	1	45	46	2	F
24	CRAWFORD	1	47	48	2	F
25	SEDGWICK	1	49	50	2	F
26	CENTRAL	1	51	52	2	F
27	I1	1	53	54	2	F
28	I2	1	55	56	2	F

```
    29 CLOSE         1     57    58    2     F
      ----------------------------------------
BMDP FILE IS BEING WRITTEN ON UNIT       3
   CODE.      IS     TEMP
   CONTENT   -IS     DATA
   LABEL      IS
        JULY 16, 1982      12:48:37
       VARIABLES ARE
      1 SHAWNEE       2 JOHNSON      3 WYANDOT
      4 SUNFLOW       5 SCENTRL      6 ECENTRL
      7 COWLEY        8 AREA         9 COUNSEL
     10 IROQUOIS     11 HPLAINS     12 KANZA
     13 SEAST        14 MHINSTIT    15 FOURCO
     16 BERTNASH     17 NEAST       18 SWEST
     19 MIAMI        20 NCENTRL     21 PRAIRIE
     22 FRANKLIN     23 LABETTE     24 CRAWFORD
     25 SEDGWICK     26 CENTRAL     27 I1
     28 I2           29 CLOSE       30 GROUP1
     31 GROUP2       32 GROUP3      33 TOTAL
BASED ON INPUT FORMAT SUPPLIED    1 RECORDS READ PER CASE

NUMBER OF CASES READ                                 84


BMDP   FILE ON UNIT  3 HAS BEEN COMPLETED
------------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE   2     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS



   TPLOT        VARIABLES ARE GROUP1, GROUP2, GROUP3.
                COMMON./



 SYMBOL FOR VARIABLE GROUP1    IS    A
 SYMBOL FOR VARIABLE GROUP2    IS    B
 SYMBOL FOR VARIABLE GROUP3    IS    C

       12.5      37.5      62.5      87.5      112
            25.0      50.0      75.0      100
      .--+----+----+----+----+----+----+----+----+----
      I             C       A B
      I          A  C            B
      I              C    A    B
      I             C   A              B
    5 +              C A         B
```

```
   I            C  A           B
   I         C        A    B
   I          C         A         B
   I         C        A      B
10 +              C A       B
   I           C   A       B
   I           *   B
   I           C      A   B
   I           C   A  B
15 +          C          A B
   I               C       B      A
   I        C          A           B
   I         C             A B
   I              *         B
20 +              AC          B
   I         C        AB
   I             C     A   B
   I             C  A   B
   I           C   A      B
25 +          C        A  B
   I         C      A      B
   I           C  A   B
   I          C     A            B
   I           C   A                  B
30 +               C   A                  B
   I           C           A  B
   I          C          *
   I       C      A B
   I           C   A B
35 +   C    AB
   I     A C    B
   I           C       A             B
   I          C     A          B
   I                   C BA
40 +        C        A            B
   I               C   A B
   I              C  A        B
   I           C     A         B
   I           C      A               B
45 +             C               A         B
   I          C       A             B
   I          C           A      B
   I             C      A              B
   I             C        A   B
50 +         C          A B
   I            C    A                   B
   I           C       A      B
   I            C      A          B
   I         C        A        B
55 +               C             BA
```

```
      I               C      A      B
      I              C        A       B
      I            C    A             B
      I             C  A                           B
   60 +     -     C      A             B
      I       C          B   A
      I C             A     B
      I       C             A B
      I       C       A             B
   65 +     C           A     B
      I       C          A    B
      I           C          A B
      I         C           B    A
      I     C          A         B
   70 +     C         A      B
      I       C       A  B
      I    C             *
      I           C       A    B
      I       C   A       B
   75 +   C          A                 B
      I      C            A         B
      I     C             A  B
      I     C           A           B
      I       C              A          B
   80 +           C     A          B
      I       C           A   B
      I       C           A            B
      I         C  A         B
      I  C          A         B
```

PAGE 3 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

```
   ACF          VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./
```

```
NUMBER OF OBSERVATIONS              =          63
MEAN OF THE (DIFFERENCED) SERIES =        52.6667
STANDARD ERROR OF THE MEAN          =       1.3779
T-VALUE OF MEAN (AGAINST ZERO)      =      38.2224
```

AUTOCORRELATIONS

1- 8	.26	.19	-.08	-.19	-.09	.10	.11	.24
ST.E	.13	.13	.14	.14	.14	.14	.15	.15

```
 9-12      0.0  .07 -.15 -.05
 ST.E      .15  .15  .15  .16

13- 20    -.07 -.01  .15  .18 -.02 -.06 -.32 -.39
 ST.E      .16  .16  .16  .16  .16  .16  .16  .17

21- 25    -.14 -.02  .14  .21  0.0
 ST.E      .19  .19  .19  .19  .19
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                 I
 1  0.261                  +     IXXXXX+X
 2  0.194                 +      IXXXXX +
 3 -0.079                 +    XXI      +
 4 -0.190                 + XXXXXI      +
 5 -0.095                 +    XXI      +
 6  0.097                 +      IXX    +
 7  0.109                 +      IXXX   +
 8  0.239                 +      IXXXXXX+
 9  0.002                 +      I      +
10  0.066                 +      IXX    +
11 -0.147                +  XXXXI        +
12 -0.051                +     XI        +
13 -0.070                +    XXI        +
14 -0.011                +      I        +
15  0.146                +      IXXXX    +
16  0.175                +      IXXXX    +
17 -0.020                +      I        +
18 -0.060                +     XI        +
19 -0.324               XXXXXXXXXI        +
20 -0.388             XX+XXXXXXXI        +
21 -0.143              +    XXXXI         +
22 -0.017              +        I         +
23  0.141              +        IXXXX     +
24  0.211              +        IXXXXX    +
25 -0.003              +        I         +
```

PAGE 4   INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

```
  PACF        VARIABLE IS GROUP1.
              MAXLAG IS 25.
              TIME=1,63./
```

```
NUMBER OF OBSERVATIONS            =           63
MEAN OF THE (DIFFERENCED) SERIES =       52.6667
```

```
STANDARD ERROR OF THE MEAN        =          1.3779
T-VALUE OF MEAN (AGAINST ZERO)    =         38.2224
```

PARTIAL AUTOCORRELATIONS

```
  1- 12      .26   .13 -.17 -.18   .04   .20   .03   .11
  ST.E       .13   .13   .13   .13   .13   .13   .13   .13

  9- 12     -.12   .09 -.10   .03
  ST.E       .13   .13   .13   .13

 13- 20     -.04 -.04   .17   .08 -.14 -.14 -.18 -.27
  ST.E       .13   .13   .13   .13   .13   .13   .13   .13

 21- 25      .11   .04   .01   .08 -.07
  ST.E       .13   .13   .13   .13   .13
```

PLOT OF SERIAL CORRELATION

```
   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.261               +     IXXXXX+X
 2  0.135               +     IXXX  +
 3 -0.173               + XXXXI     +
 4 -0.179               + XXXXI     +
 5  0.040               +     IX    +
 6  0.203               +     IXXXXX+
 7  0.025               +     IX    +
 8  0.113               +     IXXX  +
 9 -0.121               +  XXXI     +
10  0.093               +     IXX   +
11 -0.102               +  XXXI     +
12  0.030               +     IX    +
13 -0.040               +    XI     +
14 -0.038               +    XI     +
15  0.166               +     IXXXX +
16  0.079               +     IXX   +
17 -0.142               + XXXXI     +
18 -0.135               +  XXXI     +
19 -0.180               + XXXXI     +
20 -0.273              X+XXXXXI     +
21  0.108               +     IXXX  +
22  0.039               +     IX    +
23  0.007               +     I     +
24  0.078               +     IXX   +
```

```
25 -0.070                  +   XXI     +

PAGE   5     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE   6     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS RGROUP1.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP1     RANDOM            1-  84

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1      MEAN     1       0    52.6667

                                  ST  ERR   T-RATIO
                                   1.3779    38.22

RESIDUAL SUM OF SQUARES  =      7415.953125
```

```
DEGREES OF FREEDOM        =               62
RESIDUAL MEAN SQUARE      =       119.612137
PAGE   7     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS


ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN 0.1000E-03


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES

GROUP1     RANDOM            1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1   GROUP1     MEAN     1       0    52.6667
                                 ST  ERR   T-RATIO
                                  1.3779     38.22

RESIDUAL SUM OF SQUARES  =      7415.957031
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               62
RESIDUAL MEAN SQUARE     =       119.612198
PAGE   8     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS


  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         -0.0000
STANDARD ERROR OF THE MEAN         =          1.3779
T-VALUE OF MEAN (AGAINST ZERO)     =         -0.0000


AUTOCORRELATIONS

  1-  8      .26  .19 -.08 -.19 -.09  .10  .11  .24
```

```
  ST.E      .13  .13  .14  .14  .14  .14  .15  .15

  9- 12     0.0  .07 -.15 -.05
  ST.E      .15  .15  .15  .16

 13- 20    -.07 -.01  .15  .18 -.02 -.06 -.32 -.39
  ST.E      .16  .16  .16  .16  .16  .16  .16  .17

 21- 25    -.14 -.02  .14  .21  0.0
  ST.E      .19  .19  .19  .19  .19

PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.261              +     IXXXXX+X
 2  0.194             +      IXXXXX +
 3 -0.079             +    XXI      +
 4 -0.190             + XXXXXI      +
 5 -0.095             +    XXI      +
 6  0.097             +      IXX    +
 7  0.109             +      IXXX   +
 8  0.239             +      IXXXXXX+
 9  0.002             +      I      +
10  0.066             +      IXX    +
11 -0.147            +   XXXXI       +
12 -0.051            +      XI       +
13 -0.070            +     XXI       +
14 -0.011            +       I       +
15  0.146            +       IXXXX   +
16  0.175            +       IXXXX   +
17 -0.020            +       I       +
18 -0.060            +      XI       +
19 -0.324            XXXXXXXXI       +
20 -0.388          XX+XXXXXXXI       +
21 -0.143           +    XXXXI        +
22 -0.017           +        I        +
23  0.141           +        IXXXX    +
24  0.211           +        IXXXXX   +
25 -0.003           +        I        +
PAGE   9     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  10     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA       VARIABLE IS GROUP1.
```

```
               CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  11     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  12     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  13     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
                                  THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP1      RANDOM             1-  84

I1          BINARY             1-  84

I2          BINARY             1-  84
```

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MEAN	1	0	52.6666
2	I1	UP	1	0	-2.2498
3	I2	UP	1	0	0.8052

ST ERR	T-RATIO
1.3266	39.70
3.3166	-0.68
4.6381	0.17

RESIDUAL SUM OF SQUARES = 8980.382813
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 110.868912
PAGE 14 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MEAN	1	0	52.6667
2	I1	UP	1	0	-2.2500
3	I2	UP	1	0	0.8055

ST ERR	T-RATIO
1.3266	39.70
3.3174	-0.68
4.6404	0.17

RESIDUAL SUM OF SQUARES = 8980.390625
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 110.869019
PAGE 15 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

```
  ACF          VARIABLE IS IGROUP1.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS             =           84
MEAN OF THE (DIFFERENCED) SERIES   =      -0.0000
STANDARD ERROR OF THE MEAN         =       1.1349
T-VALUE OF MEAN (AGAINST ZERO)     =      -0.0000


AUTOCORRELATIONS

  1-  8     .25  .12 -.09 -.17 -.07  .05  .04  .16
  ST.E      .11  .12  .12  .12  .12  .12  .12  .12

  9- 12     .01  .08 -.07  .04
  ST.E      .12  .12  .13  .13

 13- 20     .02 -.02  .08  .11 -.06 -.03 -.30 -.32
  ST.E      .13  .13  .13  .13  .13  .13  .13  .14

 21- 25    -.08  .03  .17  .20 -.04
            .14  .15  .15  .15  .15


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.253                +   IXXXX+X
 2  0.121               +    IXXX  +
 3 -0.091               +  XXI     +
 4 -0.172               + XXXXI    +
 5 -0.067               +  XXI     +
 6  0.054               +    IX    +
 7  0.044               +    IX    +
 8  0.163               +    IXXXX +
 9  0.015               +    I     +
10  0.084               +    IXX   +
11 -0.066               +  XXI     +
12  0.041               +    IX    +
13  0.024               +    IX    +
14 -0.020               +    I     +
15  0.081               +    IXX   +
16  0.110               +    IXXX  +
17 -0.063               +  XXI     +
18 -0.031               +   XI     +
19 -0.296              X+XXXXXI    +
```

```
20 -0.323              X+XXXXXXI      +
21 -0.077               +    XXI      +
22  0.028               +      IX     +
23  0.172               +      IXXXX  +
24  0.203               +      IXXXXX +
25 -0.036               +     XI      +

PAGE  16      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  17      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA       VARIABLE IS GROUP1.
              CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  18      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
                       THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP1     RANDOM             1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1      MEAN     1       0    52.1905

                                 ST  ERR   T-RATIO
                                  1.1388     45.83

RESIDUAL SUM OF SQUARES  =      9040.847656
DEGREES OF FREEDOM       =               83
RESIDUAL MEAN SQUARE     =       108.925873
```

```
PAGE  19      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR TYPE  MEAN      TIME     DIFFERENCES

GROUP1     RANDOM              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP1        MEAN     1       0    52.1905

                                       ST  ERR   T-RATIO
                                        1.1388    45.83

RESIDUAL SUM OF SQUARES   =        9040.847656
                                (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =                  83
RESIDUAL MEAN SQUARE      =         108.925873

PAGE  20      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS IGROUP1.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS            =           84
MEAN OF THE (DIFFERENCED) SERIES =        0.0000
STANDARD ERROR OF THE MEAN        =        1.1387
T-VALUE OF MEAN (AGAINST ZERO)    =        0.0000


AUTOCORRELATIONS

  1-  8       .25  .12 -.09 -.17 -.06  .06  .05  .16
  ST.E        .11  .12  .12  .12  .12  .12  .12  .12

  9- 12       .01  .08 -.08  .03
  ST.E        .12  .12  .13  .13

 13- 20       .01 -.03  .07  .09 -.08 -.05 -.31 -.34
  ST.E        .13  .13  .13  .13  .13  .13  .13  .14

 21- 25      -.10  .01  .15  .18 -.06
```

```
 ST.E        .15  .15  .15  .15  .15


PLOT OF SERIAL CORRELATION

 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                I
  1  0.251                +     IXXXX+X
  2  0.120               +      IXXX  +
  3 -0.092               +    XXI     +
  4 -0.170               + XXXXI      +
  5 -0.061               +    XXI     +
  6  0.060               +      IXX   +
  7  0.045               +      IX    +
  8  0.162               +      IXXXX +
  9  0.010               +      I     +
 10  0.080               +      IXX   +
 11 -0.076               +    XXI     +
 12  0.029               +      IX    +
 13  0.014               +      I     +
 14 -0.031               +     XI     +
 15  0.066               +      IXX   +
 16  0.094               +      IXX   +
 17 -0.078               +    XXI     +
 18 -0.046               +     XI     +
 19 -0.314           XX+XXXXXI        +
 20 -0.342          XX+XXXXXXI         +
 21 -0.098              +     XXI      +
 22  0.007              +       I      +
 23  0.149              +       IXXXX  +
 24  0.182              +       IXXXXX +
 25 -0.058              +      XI      +

PAGE  21     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  22     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =          63
MEAN OF THE (DIFFERENCED) SERIES =       71.8413
```

```
STANDARD ERROR OF THE MEAN          =          2.0392
T-VALUE OF MEAN (AGAINST ZERO)      =         35.2303
```

AUTOCORRELATIONS

1- 8	.44	.22	.08	-.05	-.11	-.03	.07	.15
ST.E	.13	.15	.15	.15	.15	.16	.16	.16
9- 12	.05	-.10	.14	.05				
ST.E	.16	.16	.16	.16				
13- 20	.09	.19	.09	-.09	-.13	-.16	-.08	.02
ST.E	.16	.16	.17	.17	.17	.17	.17	.17
21- 25	.01	.06	-.08	-.21	-.11			
ST.E	.17	.17	.17	.17	.18			

PLOT OF SERIAL CORRELATION

```
   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.441                +     IXXXXX+XXXXX
 2  0.221               +      IXXXXXX+
 3  0.075              +       IXX     +
 4 -0.054              +      XI       +
 5 -0.111              +    XXXI       +
 6 -0.032              +      XI       +
 7  0.069              +       IXX     +
 8  0.151              +       IXXXX   +
 9  0.048              +       IX      +
10 -0.097              +     XXI       +
11  0.140              +       IXXXX   +
12  0.052              +       IX      +
13  0.085              +       IXX     +
14  0.185              +       IXXXXX  +
15  0.090              +       IXX     +
16 -0.094              +     XXI       +
17 -0.134              +    XXXI       +
18 -0.161              +   XXXXI       +
19 -0.081              +     XXI       +
20  0.018              +       I       +
21  0.007              +       I       +
22  0.065              +       IXX     +
23 -0.084              +     XXI       +
24 -0.208             +   XXXXXI        +
25 -0.109             +     XXXI        +
```

```
PAGE  23      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  PACF          VARIABLE IS GROUP2.
                MAXLAG IS 25.
                TIME=1,63./

NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =       71.8413
STANDARD ERROR OF THE MEAN         =        2.0392
T-VALUE OF MEAN (AGAINST ZERO)     =       35.2303


PARTIAL AUTOCORRELATIONS

  1-  8      .44  .03 -.04 -.10 -.06  .08  .10  .10
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.12 -.17  .34 -.05
  ST.E       .13  .13  .13  .13

 13- 20      .07  .10 -.14 -.16  .02  0.0 -.01  .04
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.02 -.12 -.11 -.05  .05
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.441                 +    IXXXXX+XXXXX
 2  0.032                 +    IX    +
 3 -0.041                 +   XI     +
 4 -0.098                 +  XXI     +
 5 -0.062                 +  XXI     +
 6  0.076                 +    IXX   +
 7  0.105                 +    IXXX  +
 8  0.098                 +    IXX   +
 9 -0.116                 + XXXI     +
10 -0.170                 +XXXXI     +
11  0.335                 +    IXXXXX+XX
12 -0.046                 +   XI     +
13  0.066                 +    IXX   +
14  0.103                 +    IXXX  +
15 -0.137                 + XXXI     +
16 -0.161                 +XXXXI     +
17  0.025                 +    IX    +
```

```
18  0.004            +     I     +
19 -0.012            +     I     +
20  0.041            +     IX    +
21 -0.018            +     I     +
22 -0.116            +  XXXI     +
23 -0.109            +  XXXI     +
24 -0.045            +    XI     +
25  0.053            +     IX    +

PAGE  24     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =           62
MEAN OF THE (DIFFERENCED) SERIES =        0.0
STANDARD ERROR OF THE MEAN        =        2.1848
T-VALUE OF MEAN (AGAINST ZERO)    =        0.0


AUTOCORRELATIONS

  1- 12     -.30 -.07  .01 -.06 -.13 -.02  .02  .16
  ST.E       .13  .14  .14  .14  .14  .14  .14  .14

  9-12       .03 -.34  .28 -.09
  ST.E       .14  .14  .16  .16

 13- 20     -.08  .19  .09 -.13 -.02 -.09 -.02  .08
  ST.E       .17  .17  .17  .17  .17  .17  .17  .17

  21-25     -.06  .18 -.01 -.21  .03
  ST.E       .17  .17  .18  .18  .18


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.303           XX+XXXXXI      +
 2 -0.072            +     XXI      +
 3  0.007            +       I      +
 4 -0.059            +      XI      +
 5 -0.135            +    XXXI      +
 6 -0.023            +      XI      +
```

```
 7  0.021              +      IX     +
 8  0.162              +      IXXXX  +
 9  0.035              +      IX     +
10 -0.341            XX+XXXXXXI      +
11  0.281             +       IXXXXXXX+
12 -0.093             +     XXI       +
13 -0.078             +     XXI       +
14  0.185             +       IXXXXX  +
15  0.087             +       IXX     +
16 -0.126             +    XXXI       +
17 -0.016             +       I       +
18 -0.091             +     XXI       +
19 -0.019             +       I       +
20  0.085             +       IXX     +
21 -0.058             +      XI       +
22  0.178            +        IXXXX    +
23 -0.011            +        I        +
24 -0.210            +   XXXXXI        +
25  0.029            +        IX       +
```

```
PAGE  25     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  PACF         VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =             62
MEAN OF THE (DIFFERENCED) SERIES  =         0.0
STANDARD ERROR OF THE MEAN        =         2.1848
T-VALUE OF MEAN (AGAINST ZERO)    =         0.0


PARTIAL AUTOCORRELATIONS

  1- 8     -.30 -.18 -.08 -.11 -.23 -.22 -.17  .06
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     .09 -.40 -.02 -.10
  ST.E      .13  .13  .13  .13

 13- 20    -.12  .12  .12 -.07 -.06 -.04 -.06 -.01
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     .07  .06 -.03 -.13 -.08
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION
```

```
 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 -0 303              XX+XXXXXI     +
 2 -0 181                +XXXXXI     +
 3 -0 084                +    XXI     +
 4 -0 111                +   XXXI     +
 5 -0.230                XXXXXXI     +
 6 -0.217                +XXXXXI     +
 7 -0.168                + XXXXI     +
 8  0.056                +      IX    +
 9  0.087                +      IXX   +
10 -0.397            XXXX+XXXXXI     +
11 -0.020                +     XI     +
12 -0.096                +    XXI     +
13 -0.120                +   XXXI     +
14  0.116                +      IXXX  +
15  0.117                +      IXXX  +
16 -0.071                +    XXI     +
17 -0.059                +     XI     +
18 -0.042                +     XI     +
19 -0.059                +     XI     +
20 -0.014                +      I     +
21  0.066                +      IXX   +
22  0.058                +      IX    +
23 -0.026                +     XI     +
24 -0.130                +   XXXI     +
25 -0.084                +    XXI     +

PAGE  26     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  27     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION   RESIDUAL IS RGROUP2.
               TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED
```

```
SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP2     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.5107

                                    ST  ERR   T-RATIO
                                    0.1123      4.55

RESIDUAL SUM OF SQUARES  =      15566.476563
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =        255.188126
PAGE  28     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
                                THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP2     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.5400

                                    ST  ERR   T-RATIO
                                    0.1091      4.95

RESIDUAL SUM OF SQUARES  =      15525.347656
                            (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =        254.513885
PAGE  29     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS RGROUP2.
               MAXLAG IS 25.
```

```
TIME=1,63./

NUMBER OF OBSERVATIONS              =             63
MEAN OF THE (DIFFERENCED) SERIES =         -0.0776
STANDARD ERROR OF THE MEAN         =          1.9947
T-VALUE OF MEAN (AGAINST ZERO)     =         -0.0389

AUTOCORRELATIONS

  1-  8      .12 -.06 -.11 -.20 -.25 -.11  .04  .16
  ST.E       .13  .13  .13  .13  .13  .14  .14  .14

  9- 12      0.0 -.25  .15 -.02
  ST.E       .15  .15  .15  .15

 13- 20      .02  .22  .12 -.12 -.13 -.16 -.05  .08
  ST.E       .15  .15  .16  .16  .16  .16  .17  .17

 21- 25      .05  .17 -.04 -.23 -.07
  ST.E       .17  .17  .17  .17  .18

PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.119              +     IXXX  +
 2 -0.060              +    XI     +
 3 -0.111              +  XXXI     +
 4 -0 202              +XXXXXI     +
 5 -0.247             +XXXXXXI      +
 6 -0.105             +   XXXI      +
 7  0.041             +      IX     +
 8  0.164             +      IXXXX  +
 9 -0.003             +      I      +
10 -0.247             +XXXXXXI      +
11  0.146             +      IXXXX  +
12 -0.021            +      XI       +
13  0.019            +       I       +
14  0.221            +       IXXXXXX +
15  0.119            +       IXXX    +
16 -0.120            +    XXXI       +
17 -0.127            +    XXXI       +
18 -0.155            +   XXXXI       +
19 -0.048            +      XI       +
20  0.082            +       IXX     +
```

```
21  0.050          +       IX      +
22  0.167          +       IXXXX   +
23 -0.040          +     XI        +
24 -0.232          + XXXXXXI       +
25 -0.066         +     XXI         +

PAGE  30     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  31     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  32     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  33     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2
PAGE  34     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP2./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO OF ITERATION 6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.6180
2	I1	UP	1	0	2.0512
3	I2	UP	1	0	6.0856

PARAMETER	VARIABLE	ST ERR	T-RATIO
1	GROUP2	0.0948	6.52
2	I1	12.4549	0.16
3	I2	12.3953	0.49

RESIDUAL SUM OF SQUARES = 18473.914063
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 230.923920

PAGE 35 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

MAXIMUM NO OF ITERATION 10 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.7995
2	I1	UP	1	0	-7.0940
3	I2	UP	1	0	9.0635

PARAMETER	VARIABLE	ST ERR	T-RATIO
1	GROUP2	0.0745	10.74
2	I1	9.8193	-0.72
3	I2	9.5322	0.95

```
RESIDUAL SUM OF SQUARES   =     18223.347656
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =               80
RESIDUAL MEAN SQUARE      =       227.791840
```

PAGE 36 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

```
  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS             =           84
MEAN OF THE (DIFFERENCED) SERIES =         0.0061
STANDARD ERROR OF THE MEAN         =       1.6181
T-VALUE OF MEAN (AGAINST ZERO)     =       0.0038
```

AUTOCORRELATIONS

1- 8	.23	0.0	-.07	-.18	-.22	-.11	.01	.03
ST.E	.11	.11	.11	.12	.12	.12	.12	.12
9- 12	.01	-.14	.12	-.03				
ST.E	.12	.12	.13	.13				
13- 20	.04	.11	.07	-.01	-.17	-.15	-.03	.10
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	.04	.16	-.04	-.17	-.11			
ST.E	.14	.14	.14	.14	.14			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                 I
 1  0.227                  +     IXXXX+X
 2  0.005                 +      I     +
 3 -0.072                 +    XXI     +
```

```
 4 -0.183           +XXXXXI     +
 5 -0.224           XXXXXXI     +
 6 -0.115           +  XXXI     +
 7  0.006           +     I     +
 8  0.029           +     IX    +
 9  0.009           +     I     +
10 -0.141           + XXXXI     +
11  0.121           +     IXXX  +
12 -0.031           +    XI     +
13  0.037           +     IX    +
14  0.105           +     IXXX  +
15  0.069           +     IXX   +
16 -0.011           +     I     +
17 -0.175           + XXXXI     +
18 -0.151           + XXXXI     +
19 -0.026          +     XI      +
20  0.098          +      IXX    +
21  0.042          +      IX     +
22  0.160          +      IXXXX  +
23 -0.043          +     XI      +
24 -0.166          +  XXXXI      +
25 -0.114          +   XXXI      +

PAGE   37     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE   38     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE   39     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
```

```
INPUT  VARIABLE = NOISE     I1
PAGE  40      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1        I2
PAGE  41      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1        I2        CLOSE
PAGE  42      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP2     RANDOM             1-   84  (1-B  )
                                              1
I1         BINARY             1-   84  (1-B  )
                                              1
I2         BINARY             1-   84  (1-B  )
                                              1
CLOSE      BINARY             1-   84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
```

1	GROUP2	MA	1	1	0.6588
2	I1	UP	1	0	9.9203
3	I2	UP	1	0	7.0092
4	CLOSE	UP	1	0	-34.2755

ST ERR	T-RATIO
0.0905	7.28
11.5384	0.86
11.2922	0.62
11.6062	-2.95

RESIDUAL SUM OF SQUARES = 16557.039063
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 209.582764

PAGE 43 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

MAXIMUM NO OF ITERATION 10 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.7747
2	I1	UP	1	0	8.2901
3	I2	UP	1	0	8.8099
4	CLOSE	UP	1	0	-30.6790

ST ERR	T-RATIO
0.0751	10.32
10.3734	0.80
9.3366	0.94
10.5593	-2.91

RESIDUAL SUM OF SQUARES = 16413.097656

```
                                   (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM          =                 79
RESIDUAL MEAN SQUARE        =         207.760727

PAGE  44      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =             84
MEAN OF THE (DIFFERENCED) SERIES =            0.8017
STANDARD ERROR OF THE MEAN          =         1.5333
T-VALUE OF MEAN (AGAINST ZERO)      =         0.5229


AUTOCORRELATIONS

  1-  8      .18  .03 -.02 -.17 -.26 -.13 -.02  .02
  ST.E       .11  .11  .11  .11  .12  .12  .12  .12

  9- 12     -.06 -.17  .10 -.04
  ST.E       .12  .12  .13  .13

 13- 20      .04  .15  .09  .05 -.06 -.08  .01  .08
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25      .06  .14 -.03 -.11 -.10
  ST.E       .13  .13  .14  .14  .14


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.183                +   IXXXXX
 2  0.033               +    IX    +
 3 -0.022               +   XI     +
 4 -0.171               + XXXXI    +
 5 -0.261              X+XXXXXI    +
 6 -0.129               +  XXXI    +
 7 -0.019               +    I     +
 8  0.016               +    I     +
 9 -0.055               +   XI     +
10 -0.167               + XXXXI    +
11  0.096               +    IXX   +
12 -0.041               +   XI     +
13  0.042               +    IX    +
14  0.151               +    IXXXX +
```

```
15  0.093              +      IXX    +
16  0.053              +      IX     +
17 -0.064              +    XXI      +
18 -0.077              +    XXI      +
19  0.013              +      I      +
20  0.085              +      IXX    +
21  0.063            +        IXX     +
22  0.145            +        IXXXX   +
23 -0.029            +      XI        +
24 -0.105            +    XXXI        +
25 -0.095            +     XXI        +

PAGE  45     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE .      MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  46     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =          63
MEAN OF THE (DIFFERENCED) SERIES =     35.4603
STANDARD ERROR OF THE MEAN        =      0.9093
T-VALUE OF MEAN (AGAINST ZERO)    =     38.9970


AUTOCORRELATIONS

  1-  8     .22  .14  0.0 -.09 -.22 -.25 -.08  0.0
  ST.E      .13  .13  .13  .13  .13  .14  .15  .15

  9- 12     .04  .04  0.0 -.01
  ST.E      .15  .15  .15  .15

 13- 20    -.20  .09 -.03 -.03  .06  .08  .07 -.12
  ST.E      .15  .15  .15  .15  .15  .15  .15  .15

 21- 25    -.16 -.11 -.15 -.19  .06
  ST.E      .16  .16  .16  .16  .17


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
```

```
 1  0.217          +     IXXXXX+
 2  0.136          +     IXXX  +
 3 -0.003         +      I      +
 4 -0.089         +    XXI      +
 5 -0.218         + XXXXXI      +
 6 -0.246         +XXXXXXI      +
 7 -0.084         +    XXI      +
 8 -0.002         +      I      +
 9  0.036         +      IX     +
10  0.036         +      IX     +
11  0.004         +      I      +
12 -0.008         +      I      +
13 -0.196         + XXXXXI      +
14  0.092         +      IXX    +
15 -0.029         +     XI      +
16 -0.034        +      XI       +
17  0.058        +       IX      +
18  0.084        +       IXX     +
19  0.071        +       IXX     +
20 -0.125        +    XXXI       +
21 -0.164        +   XXXXI       +
22 -0.106        +    XXXI       +
23 -0.149        +   XXXXI       +
24 -0.187        +  XXXXXI       +
25  0.064        +       IXX     +
```

PAGE 47 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

```
  PACF        VARIABLE IS GROUP3.
              MAXLAG IS 25.
              TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	63
MEAN OF THE (DIFFERENCED) SERIES	=	35.4603
STANDARD ERROR OF THE MEAN	=	0.9093
T-VALUE OF MEAN (AGAINST ZERO)	=	38.9970

PARTIAL AUTOCORRELATIONS

1- 8	.22	.09	-.05	-.10	-.19	-.17	.03	.05
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
9- 12	.01	-.04	-.09	-.05				
ST.E	.13	.13	.13	.13				
13- 24	-.20	.21	-.02	-.09	.04	0.0	.01	-.14
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	-.16	-.03	-.09	-.16	.14			

```
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.217               +     IXXXXX+
 2  0.093               +     IXX   +
 3 -0.053               +    XI     +
 4 -0.096               +   XXI     +
 5 -0.187               +XXXXXI     +
 6 -0.165               + XXXXI     +
 7  0.033               +     IX    +
 8  0.051               +     IX    +
 9  0.007               +     I     +
10 -0.043               +    XI     +
11 -0.090               +   XXI     +
12 -0.049               +    XI     +
13 -0.201               +XXXXXI     +
14  0.211               +     IXXXXX+
15 -0.022               +    XI     +
16 -0.088               +   XXI     +
17  0.037               +     IX    +
18  0.000               +     I     +
19  0.010               +     I     +
20 -0.140               +  XXXI     +
21 -0.161               + XXXXI     +
22 -0.031               +    XI     +
23 -0.091               +   XXI     +
24 -0.160               + XXXXI     +
25  0.137               +     IXXX  +

PAGE  48      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  49      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
```

```
PAGE  50      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA         VARIABLE IS GROUP3.
                CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  51      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP         VARIABLE IS I1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  52      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP         VARIABLE IS I2.
                UPORDER IS '(0)'.
                TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  53      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES

GROUP3     RANDOM              1-  84
```

```
I1          BINARY              1-  84

I2          BINARY              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MEAN     1       0    35.4603
      2  I1            UP      1       0   -11.2103
      3  I2            UP      1       0    -0.4722

                                    ST  ERR   T-RATIO
                                     0.8829     40.17
                                     2.2072     -5.08
                                     3.0930     -0.15

RESIDUAL SUM OF SQUARES  =       3977.448975
DEGREES OF FREEDOM       =                81
RESIDUAL MEAN SQUARE     =         49.104294

PAGE  54     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES

GROUP3      RANDOM              1-  84

I1          BINARY              1-  84

I2          BINARY              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MEAN     1       0    35.4603
      2  I1            UP      1       0   -11.2103
      3  I2            UP      1       0    -0.4722

                                    ST  ERR   T-RATIO
                                     0.8829     40.16
                                     2.2071     -5.08
                                     3.0948     -0.15

RESIDUAL SUM OF SQUARES  =       3977.448975
```

```
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                  81
RESIDUAL MEAN SQUARE     =           49.104294

PAGE  55     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ACF          VARIABLE IS IGROUP3.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =          84
MEAN OF THE (DIFFERENCED) SERIES =         0.0000
STANDARD ERROR OF THE MEAN          =         0.7553
T-VALUE OF MEAN (AGAINST ZERO)      =         0.0000


AUTOCORRELATIONS

  1- 8      .17  .08  .01 -.16 -.28 -.20 -.01  0.0
  ST.E      .11  .11  .11  .11  .12  .12  .13  .13

  9- 12     .09  .05 -.08  .04
  ST.E      .13  .13  .13  .13

 13- 20    -.11  .12  .02  .01  0.0  .01 -.01 -.16
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.16 -.03 -.09 -.11  .11
  ST.E      .13  .14  .14  .14  .14


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.167                +    IXXXX+
 2  0.080                +    IXX  +
 3  0.014               +     I     +
 4 -0.160               + XXXXI     +
 5 -0.284              X+XXXXXI     +
 6 -0.203               +XXXXXI     +
 7 -0.013               +     I     +
 8 -0.004               +     I     +
 9  0.092               +     IXX   +
10  0.051               +     IX    +
11 -0.081               +   XXI     +
12  0.035               +     IX    +
13 -0.113               +  XXXI     +
14  0.123               +     IXXX  +
```

```
15  0.019                 +     I     +
16  0.006                 +     I     +
17 -0.001                 +     I     +
18  0.012                 +     I     +
19 -0.012                 +     I     +
20 -0.158                 + XXXXI     +
21 -0.165                +  XXXXI      +
22 -0.031                +     XI      +
23 -0.089                +    XXI      +
24 -0.108                +   XXXI      +
25  0.113                +      IXXX   +

PAGE  56     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  57     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  58     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  59     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2
PAGE  60     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS
```

```
  INDEP       VARIABLE IS CLOSE.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  61     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP3     RANDOM .            1-  84

I1         BINARY              1-  84

I2         BINARY              1-  84

CLOSE      BINARY              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1   GROUP3      MEAN     1      0    36.2333
      2   I1           UP      1      0     4.2500
      3   I2           UP      1      0    -0.4722
      4   CLOSE        UP      1      0   -16.2333

                                  ST  ERR   T-RATIO
                                   0.8196     44.21
                                   4.0989      1.04
                                   2.7931     -0.17
                                   3.7562     -4.32

RESIDUAL SUM OF SQUARES   =      3224.528809
DEGREES OF FREEDOM        =               80
RESIDUAL MEAN SQUARE      =        40.306610
```

PAGE 62 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	36.2333
2	I1	UP	1	0	4.2500
3	I2	UP	1	0	-0.4722
4	CLOSE	UP	1	0	-16.2333

ST ERR	T-RATIO
0.8197	44.21
4.0970	1.04
2.7948	-0.17
3.7562	-4.32

RESIDUAL SUM OF SQUARES = 3224.530762
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 40.306625

PAGE 63 INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.6801
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

```
AUTOCORRELATIONS

  1-  8     -.01  .06  .03 -.09 -.18 -.08  .02 -.02
  ST.E       .11  .11  .11  .11  .11  .11  .11  .11

  9- 12      .03  .10 -.10  .07
  ST.E       .11  .11  .12  .12

 13- 20     -.18  .11 -.03 -.03  .04  .10  .09 -.06
  ST.E       .12  .12  .12  .12  .12  .12  .12  .12

 21- 25     -.17  .04 -.12 -.05  .09
  ST.E       .12  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.005               +    I    +
 2  0.064               +    IXX  +
 3  0.034               +    IX   +
 4 -0.091               +  XXI    +
 5 -0.182               XXXXXI    +
 6 -0.075              +   XXI     +
 7  0.024              +     IX    +
 8 -0.023              +    XI     +
 9  0.027              +     IX    +
10  0.099              +     IXX   +
11 -0.098              +   XXI     +
12  0.066              +     IXX   +
13 -0.179              + XXXXI     +
14  0.109              +     IXXX  +
15 -0.031              +    XI     +
16 -0.029              +    XI     +
17  0.042              +     IX    +
18  0.097              +     IXX   +
19  0.094              +     IXX   +
20 -0.065              +   XXI     +
21 -0.173              + XXXXI     +
22  0.039              +     IX    +
23 -0.120              +  XXXI     +
24 -0.047              +    XI     +
25  0.088              +     IXX   +

PAGE  64      INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

  END./
```

```
NUMBER OF INTEGER WORDS OF STORAGE USED IN
                  PRECEDING  PROBLEM  4622
CPU TIME USED       7.222 SECONDS
PAGE  65     INTERVENTION ANALYSES FOR MH 1ST ADMISSIONS

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
    JULY 16, 1982  AT 12:49:21


PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED
```

MH Readmissions

```
//L84SAL JOB (3084,028A,,10),'LUEGER',TIME=(0,30),CLASS=6
/*JOBPARM Q=FETCH,I
//STEP1  EXEC  BIMED,PROG=BMDP2T
//FT06F001 DD DSN=&&TEMP1,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD *
/ PRINT        PAGESIZE=0.
/ PROBLEM      TITLE IS 'INTERVENTION ANALYSES FOR MH
               READMISSIONS'.
/ INPUT        VARIABLES ARE 29.
               FORMAT IS '(29F2.0)'.
/ VARIABLE     NAMES ARE SHAWNEE, JOHNSON, WYANDOT, SUNFLOW,
               SCENTRL,ECENTRL,COWLEY,AREA,COUNSEL,IROQUOIS,
               HPLAINS, KANZA,SEAST,MHINSTIT,FOURCO,BERTNASH,
               NEAST, SWEST, MIAMI,NCENTRL,PRAIRIE,FRANKLIN,
               LABETTE, CRAWFORD, SEDGWICK,CENTRAL,I1,I2,
               CLOSE, GROUP1, GROUP2,GROUP3, TOTAL.
               ADD = 4.
/ TRANSFORM    GROUP1 = JOHNSON + SEDGWICK + HPLAINS +
                        IROQUOIS + NEAST + SUNFLOW +
                        NCENTRL + SEAST.
               GROUP2 = WYANDOT + MHINSTIT + COWLEY + SCENTRL
                        + ECENTRL + FOURCO + SWEST + COUNSEL
                        + BERTNASH + PRAIRIE + CENTRAL
                        + KANZA + CRAWFORD.
               GROUP3 = SHAWNEE + AREA + MIAMI + FRANKLIN +
                        LABETTE.
               TOTAL  = SHAWNEE + JOHNSON + WYANDOT + SUNFLOW
                        + SCENTRL + ECENTRL + COWLEY +
                        AREA + COUNSEL + IROQUOIS +
                        HPLAINS + KANZA + SEAST + MHINSTIT +
                        FOURCO + BERTNASH + NEAST + SWEST +
                        MIAMI + NCENTRL + PRAIRIE +
                        FRANKLIN + LABETTE + CRAWFORD +
                        SEDGWICK + CENTRAL.
/ SAVE         NEW. UNIT=3.  CODE=TEMP.
/ END
381834 0 5 3 0 516 014 2 815 5 8 6 5 0 3 0 2 6 169 4 0 0 0
201225 0 6 4 1 9 8 2 6 3 6 510 6 4 4 3 5 3 2 4 140 2 0 0 0
292429 0 3 5 31110 0 9 6131313 4 7 2 9 6 4 3 3 336 6 0 0 0
361240 1 3 7 212 7 012 3101311 3 8 4 7 3 0 1 4 462 4 0 0 0
292137 1 5 6 112 4 110 1 3 611 311 0 6 8 2 2 6 355 5 0 0 0
372435 0 3 4 111 6 013 31211 4 4 6 5 310 0 6 3 140 3 0 0 0
251315 1 2 6 2 610 314 111 9 9 1 4 3 4 6 2 3 6 444 1 0 0 0
251524 2 3 4 1 914 212 2 9 6 7 310 1 4 4 2 1 5 736 3 0 0 0
281733 0 7 7 4 6 8 213 310 510 3 6 2 4 9 1 2 3 537 4 0 0 0
361529 0 8 4 4 315 210 11713 9 1 0 2 6 1 0 3 5 447 5 0 0 0
```

242229 4 2 4 21210 314 2 9 811 510 2 3 6 0 3 5 535 4 0 0 0
282224 0 4 1 1 416 3 7 310 310 8 5 2 8 0 3 0 1 249 4 0 0 0
262134 0 2 3 3 714 4 7 3 9 612 5 8 0 6 6 2 5 5 415 3 0 0 0
292330 0 4 1 3 9 9 011 4 4 510 1 1 3 6 4 1 2 3 614 4 0 0 0
302537 0 3 6 21114 2 5 3 91612 513 2 4 6 4 1 7 218 5 0 0 0
322342 0 2 4 4 8 9 415 4 9 8 7 3 9 3 4 1 2 3 3 810 2 0 0 0
291437 0 2 1 0 519 3 4 2 6 810 613 0 4 5 3 1 5 719 4 0 0 0
271339 0 6 5 0 819 110 112 617 2 2 2 5 6 4 3 3 210 0 0 0 0
411328 2 3 2 51114 4 9 410 811 311 2 311 2 4 4 352 5 0 0 0
381738 1 7 3 11013 415 8 81014 3 9 0 3 6 1 3 5 741 4 0 0 0
311634 1 5 2 312 8 3 5 4 7 8 9 3 8 5 5 4 0 1 5 225 6 0 0 0
361839 1 5 0 1 3 9 1 6 2 31114 7 8 2 5 3 4 2 2 228 2 0 0 0
221218 0 5 3 2 611 2 6 2 7 4 7 2 8 1 4 3 1 4 9 218 4 0 0 0
211436 1 6 3 2 7 7 1 5 2 8 710 4 8 0 4 3 2 2 3 225 4 0 0 0
301634 3 3 1 01115 4 9 818 9 6 2 9 4 2 2 3 1 6 320 7 0 0 0
211950 2 3 1 0 712 011 11110 4 4 0 0 6 4 3 2 4 321 1 0 0 0
36 955 2 4 1 1 815 2 9 3 9 6 5 5 9 1 112 3 2 4 917 4 0 0 0
172235 0 1 2 1 518 1 6 1 713 9 3 5 1 1 9 2 3 3 321 5 0 0 0
30 729 0 0 3 11013 0 6 3 511 6 2 1 0 6 5 2 2 3 120 2 0 0 0
301431 0 2 4 1 516 1 7 3 4 113 3 9 1 4 3 3 2 4 328 3 0 0 0
232041 0 4 3 01216 115 4 9 711 5 9 2 4 5 8 1 3 514 0 0 0 0
271734 1 6 5 0 817 7 6 1 8 8 7 4 4 1 6 1 0 2 2 318 5 0 0 0
26 829 3 3 1 1 7 9 210 7 512 5 2 3 2 1 5 2 0 1 010 8 0 0 0
261515 0 0 1 01018 414 1 110 0 2 0 4 0 4 4 1 0 012 2 0 0 0
22 311 1 0 5 0 515 2 9 4 0 4 1 2 1 2 0 7 3 0 0 015 5 0 0 0
291216 0 1 2 0 213 4 8 0 0 9 0 4 3 2 0 4 2 0 0 026 4 0 0 0
29 919 0 1 2 01213 012 3 4 7 4 7 2 2 9 2 2 0 1 130 6 0 0 0
271631 0 0 2 211 9 214 2 416 8 6 1 1 4 4 1 0 1 020 2 0 0 0
351230 1 4 3 310 9 4 8 7 5 5 8 5 7 3 5 3 2 2 3 619 5 0 0 0
262028 3 2 3 21010 6 9 21411 910 6 1 9 6 0 2 3 226 3 0 0 0
432630 0 3 5 11016 311 4 7 614 6 6 110 4 3 4 6 323 4 0 0 0
311726 1 4 4 21018 5 8 3 7 817 413 2 6 5 3 1 5 423 2 0 0 0
311228 2 2 3 0 826 2 4 3 313 9 2 2 3 3 5 2 2 6 116 3 0 0 0
301127 4 2 1 1 717 1 5 4 1 9 8 2 5 4 3 4 5 0 1 214 7 0 0 0
381028 2 1 1 0 711 3 6 2 5 2 3 314 1 6 6 3 1 3 120 1 0 0 0
271025 1 2 1 0 6 5 3 6 0 4 5 8 3 3 0 0 3 1 4 3 223 4 0 0 0
37 423 2 0 4 0 217 2 8 6 4 7 6 4 1 1 4 1 3 1 1 124 3 0 0 0
251212 0 1 3 0 816 2 8 2 6 6 6 7 4 2 3 3 3 2 0 118 2 0 0 0
161432 1 4 3 5 3 6 1 4 2121213 2 6 1 3 5 1 0 3 525 1 0 0 0
221625 0 0 5 2 1 4 1 2 3 8 2 8 5 3 1 2 5 1 2 0 2 9 4 0 0 0
251039 0 1 4 610 8 0 7 2 5 610 6 5 1 5 4 1 3 6 412 2 0 0 0
201829 2 3 4 2 2 8 1 4 1 9 511 4 0 0 3 2 1 5 3 211 5 0 0 0
261743 2 3 1 1 222 0 7 1 5 5 8 3 3 3 6 6 2 4 6 713 2 0 0 0
251526 0 0 3 3 524 2 9 310 8 4 2 6 2 7 7 2 4 5 211 1 0 0 0
271143 0 2 6 3 611 111 214 912 2 6 0 5 5 0 310 412 1 0 0 0
252631 2 5 4 11219 2 4 6 8 713 2 6 0 6 4 0 4 5 711 2 0 0 0
141528 0 2 3 4 616 1 8 311 9 9 0 2 1 7 3 3 3 2 318 2 0 0 0
171124 1 2 3 1 518 2 2 218 8 7 5 6 2 9 6 2 5 4 422 7 0 0 0
281237 1 5 3 2 613 111 110 4 8 1 8 1 8 4 2 4 4 216 4 0 0 0
20 723 1 1 6 31011 0 6 012 5 8 5 4 1 3 4 2 2 6 612 3 0 0 0

```
15 624 0 0 2 1 213 0 3 2 4 4 6 1 6 1 5 6 2 1 4 0 3 2 0 0 1
121320 1 3 1 1 6 9 0 1 3 5 610 0 2 1 8 2 2 2 6 220 2 0 0 1
161230 0 3 1 0 7 9 1 2 0 8 8 6 310 4 5 3 1 3 4 216 1 0 0 1
171028 1 1 5 2 712 1 3 2 9 9 4 3 5 312 0 1 1 5 720 2 1 0 1
191530 0 1 8 1 713 0 3 1 7 310 4 7 3 4 1 0 2 6 314 1 1 0 1
171433 2 2 4 2 1 8 2 6 3 9 710 0 6 210 4 4 3 3 516 0 1 0 1
161526 2 4 2 1 525 0 6 1 6 815 010 2 9 4 0 2 2 5 8 1 1 0 1
221137 0 1 3 3 614 1 1 2 8 819 2 5 310 2 3 1 6 512 1 1 0 1
16 825 2 2 1 21023 0 3 2 4 4 7 2 3 4 5 2 2 3 3 310 1 1 0 1
 92234 0 1 3 1 821 3 0 2 5 3 6 3 5 0 5 2 0 2 1 422 3 1 0 1
131435 2 3 2 0 410 2 2 1 9 5 8 1 3 1 8 3 2 0 5 119 2 1 0 1
111031 0 2 2 0 413 2 3 012 5 8 1 3 0 6 3 0 1 2 110 1 1 0 1
 71430 0 2 2 0 4 8 0 5 2 5 2 3 2 3 2 4 3 0 0 1 614 3 1 0 1
 71131 0 2 5 0 3 6 3 5 0 9 8 8 2 6 0 3 2 2 1 3 123 2 1 0 1
 9 936 2 0 6 1 318 0 4 3 8 4 8 1 3 1 7 1 4 3 3 215 2 1 0 1
101536 0 211 3 6 9 1 2 2 2 713 2 5 1 6 6 1 2 4 127 0 1 1 1
101137 1 1 3 2 6 6 2 4 410 2 7 1 6 3 5 3 2 2 3 518 1 1 1 1
12 839 0 2 3 1 2 6 3 2 3 3 213 1 2 1 5 2 2 2 3 419 3 1 1 1
 81943 0 0 2 1 213 2 3 1 8 7 5 1 5 0 2 7 2 3 4 617 4 1 1 1
151128 1 1 5 2 412 2 3 3 6 6 8 1 3 2 8 0 1 5 4 517 1 1 1 1
111324 0 1 5 1 7 7 1 3 1 7 4 4 3 6 1 9 5 1 2 4 4 9 3 1 1 1
12 927 1 4 1 1 618 1 7 2 5 6 8 3 4 0 9 4 1 3 2 511 3 1 1 1
11 933 0 0 3 2 511 2 5 0 9 5 6 4 4 1 9 3 1 1 3 310 2 1 1 1
 2 932 1 1 6 3 4 8 3 3 1 6 4 8 1 5 2 6 1 2 0 1 110 0 1 1 1
/ END
 TPLOT          VARIABLES ARE GROUP1, GROUP2, GROUP3.
                COMMON./
 ACF            VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./
 PACF           VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./
 ACF            VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./
 PACF           VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./
 ARIMA          VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAORDER IS '(1)'./
 ESTIMATION     RESIDUAL IS RGROUP1.
                TIME=1,63./
 ACF            VARIABLE IS RGROUP1.
                MAXLAG IS 25.
                TIME=1,63./
 ERASE          MODEL./
```

```
ARIMA           VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL IS IGROUP1./
ACF             VARIABLE IS IGROUP1.
                MAXLAG IS 25./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS CLOSE.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL IS IGROUP1./
ACF             VARIABLE IS IGROUP1.
                MAXLAG IS 25./
ERASE           MODEL./
ACF             VARIABLE IS GROUP2.
                MAXLAG IS 25.
                TIME=1,63./
PACF            VARIABLE IS GROUP2.
                MAXLAG IS 25.
                TIME=1,63./
ACF             VARIABLE IS GROUP2.
                DFORDER IS 12.
                MAXLAG IS 25.
                TIME=1,63./
PACF            VARIABLE IS GROUP2.
                DFORDER IS 12.
                MAXLAG IS 25.
                TIME=1,63./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 12.
```

```
                ARORDER IS '(1),(12)'./
ESTIMATION      RESIDUAL IS RGROUP2.
                TIME=1,63./
ACF             VARIABLE IS RGROUP2.
                MAXLAG IS 25.
                TIME=1,63./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 12.
                ARORDER IS '(1),(12)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 12.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 12.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP2./
ACF             VARIABLE IS IGROUP2.
                MAXLAG IS 25./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 12.
                ARORDER IS '(1),(12)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 12.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 12.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS CLOSE.
                DFORDER IS 12.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP2./
ACF             VARIABLE IS IGROUP2.
                MAXLAG IS 25./
ERASE           MODEL./
ACF             VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./
PACF            VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./
ACF             VARIABLE IS GROUP3.
                DFORDER IS 1.
                MAXLAG IS 25.
```

```
                TIME=1,63./
PACF            VARIABLE IS GROUP3.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./
ARIMA           VARIABLE IS GROUP3.
                DFORDER IS 1.
                MAORDER IS '(1)'./
ESTIMATION      RESIDUAL IS RGROUP3.
                TIME=1,63./
ACF             VARIABLE IS RGROUP3.
                MAXLAG IS 25.
                TIME=1,63./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP3.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP3./
ACF             VARIABLE IS IGROUP3.
                MAXLAG IS 25./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP3.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS CLOSE.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP3./
ACF             VARIABLE IS IGROUP3.
                MAXLAG IS 25./
END /
//STEP2  EXEC SAS,OPTIONS='NOSOURCE'
//IN     DD DSN=&&TEMP1,DISP=(OLD,DELETE)
```

```
//OUT    DD DSN=&&TEMP2,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD DSN=L84SAL.SAS.CNTL(FIGURES),DISP=SHR
//STEP3 EXEC IEBGENER
//SYSUT1 DD DSN=&&TEMP2,DISP=(OLD,DELETE)
//SYSUT2 DD DSN=L84SAL.MHREAD,DCB=(RECFM=FB,LRECL=133,
    BLKSIZE=931),
//  DISP=(,CATLG,DELETE),SPACE=(TRK,(2,5),RLSE),UNIT=SYSTS,
//  LABEL=RETPD=120,VOL=SER=LD5010
//SYSIN  DD DUMMY
//
```

The output for the MH readmissions analyses follow.

```
PAGE    1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY 19, 1982  AT 11:37:53

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES FOR
                MH READMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'
/ VARIABLE      NAMES ARE SHAWNEE, JOHNSON, WYANDOT,
                SUNFLOW, SCENTRL, ECENTRL, COWLEY,
                AREA, COUNSEL, IROQUOIS, HPLAINS,
                KANZA, SEAST, MHINSTIT, FOURCO,
                BERTNASH, NEAST, SWEST, MIAMI,
                NCENTRL, PRAIRIE, FRANKLIN, LABETTE,
                CRAWFORD, SEDGWICK, CENTRAL, I1, I2,
                CLOSE, GROUP1, GROUP2,
                GROUP3, TOTAL.
                ADD = 4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS
                         + IROQUOIS + NEAST + SUNFLOW +
```

```
                   NCENTRL + SEAST.
          GROUP2 = WYANDOT + MHINSTIT + COWLEY
                   + SCENTRL + ECENTRL + FOURCO
                   + SWEST + COUNSEL + BERTNASH
                   + PRAIRIE + CENTRAL + KANZA +
                   CRAWFORD.
          GROUP3 = SHAWNEE + AREA + MIAMI +
                   FRANKLIN + LABETTE.
          TOTAL  = SHAWNEE + JOHNSON + WYANDOT +
                   SUNFLOW + SCENTRL + ECENTRL +
                   COWLEY + AREA + COUNSEL +
                   IROQUOIS + HPLAINS + KANZA
                   + SEAST + MHINSTIT + FOURCO
                   + BERTNASH + NEAST + SWEST +
                   MIAMI + NCENTRL + PRAIRIE +
                   FRANKLIN + LABETTE +
                   CRAWFORD + SEDGWICK + CENTRAL.
/ SAVE         NEW. UNIT=3.  CODE=TEMP.
/ END
PROBLEM TITLE IS
INTERVENTION ANALYSES FOR MH READMISSIONS

NUMBER OF VARIABLES TO READ IN                          29
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS             4
TOTAL NUMBER OF VARIABLES                               33
NUMBER OF CASES TO READ IN                 .        TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS       NEITHER
BLANKS ARE                                         MISSING
INPUT UNIT NUMBER                                        5
REWIND INPUT UNIT PRIOR TO READING    DATA              NO
NUMBER OF WORDS OF DYNAMIC STORAGE                   45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT                1

***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 SHAWNEE      2 JOHNSON      3 WYANDOT
     4 SUNFLOW      5 SCENTRL      6 ECENTRL
     7 COWLEY       8 AREA         9 COUNSEL
    10 IROQUOIS    11 HPLAINS     12 KANZA
    13 SEAST       14 MHINSTIT    15 FOURCO
    16 BERTNASH    17 NEAST       18 SWEST
    19 MIAMI       20 NCENTRL     21 PRAIRIE
    22 FRANKLIN    23 LABETTE     24 CRAWFORD
    25 SEDGWICK    26 CENTRAL     27 I1
    28 I2          29 CLOSE       30 GROUP1
    31 GROUP2      32 GROUP3      33 TOTAL
INPUT FORMAT IS
(29F2.0)
```

MAXIMUM LENGTH DATA RECORD IS 58 CHARACTERS

I N P U T   V A R I A B L E S

VARIABLE INDEX	VARIABLE NAME	RECORD NO	COLUMNS BEGIN	COLUMNS END	FIELD WIDTH	TYPE
1	SHAWNEE	1	1	2	2	F
2	JOHNSON	1	3	4	2	F
3	WYANDOT	1	5	6	2	F
4	SUNFLOW	1	7	8	2	F
5	SCENTRL	1	9	10	2	F
6	ECENTRL	1	11	12	2	F
7	COWLEY	1	13	14	2	F
8	AREA	1	15	16	2	F
9	COUNSEL	1	17	18	2	F
10	IROQUOIS	1	19	20	2	F
11	HPLAINS	1	21	22	2	F
12	KANZA	1	23	24	2	F
13	SEAST	1	25	26	2	F
14	MHINSTIT	1	27	28	2	F
15	FOURCO	1	29	30	2	F
16	BERTNASH	1	31	32	2	F
17	NEAST	1	33	34	2	F
18	SWEST	1	35	36	2	F
19	MIAMI	1	37	38	2	F
20	NCENTRL	1	39	40	2	F
21	PRAIRIE	1	41	42	2	F
22	FRANKLIN	1	43	44	2	F
23	LABETTE	1	45	46	2	F
24	CRAWFORD	1	47	48	2	F
25	SEDGWICK	1	49	50	2	F
26	CENTRAL	1	51	52	2	F
27	I1	1	53	54	2	F
28	I2	1	55	56	2	F
29	CLOSE	1	57	58	2	F

```
BMDP FILE IS BEING WRITTEN ON UNIT       3
CODE.     IS     TEMP
CONTENT   IS     DATA
LABEL     IS
     JULY 19, 1982      11:37:53
VARIABLES ARE
     1 SHAWNEE      2 JOHNSON      3 WYANDOT
     4 SUNFLOW      5 SCENTRL      6 ECENTRL
     7 COWLEY       8 AREA         9 COUNSEL
    10 IROQUOIS    11 HPLAINS     12 KANZA
    13 SEAST       14 MHINSTIT    15 FOURCO
    16 BERTNASH    17 NEAST       18 SWEST
    19 MIAMI       20 NCENTRL     21 PRAIRIE
```

```
    22 FRANKLIN    23 LABETTE     24 CRAWFORD
    25 SEDGWICK    26 CENTRAL     27 I1
    28 I2          29 CLOSE       30 GROUP1
    31 GROUP2      32 GROUP3      33 TOTAL
BASED ON INPUT FORMAT SUPPLIED    1 RECORDS READ PER CASE

NUMBER OF CASES READ                                    84

BMDP   FILE ON UNIT  3 HAS BEEN COMPLETED
----------------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE   2     INTERVENTION ANALYSES FOR MH READMISSIONS
```

```
TPLOT          VARIABLES ARE GROUP1, GROUP2, GROUP3.
               COMMON./

SYMBOL FOR VARIABLE GROUP1    IS    A
SYMBOL FOR VARIABLE GROUP2    IS    B
SYMBOL FOR VARIABLE GROUP3    IS    C

     12.5      37.5      62.5      87.5      112
          25.0      50.0      75.0      100       125
     .-+----+----+----+----+----+----+----+----+----+
     I                C                  B       A
     I           C              AB
     I                  C               A B
     I                    C               B  A
   5 +                  C           B         A
     I                    C       B         A
     I              C       B           A
     I              C            B    A
     I             C                   BA
  10 +                 C               AB
     I               C              B      A
     I            C               B     A
     I                C       A       B
     I                C  A        B
  15 +                 C         A            B
     I                C       A          B
     I              C       A             B
     I              C   A                  B
     I                     C          B        A
  20 +                    C               A   B
     I                  C     A       B
     I               C       A           B
     I              C   A  B
     I           C          A       B
  25 +                C           A     B
     I            C          A         B
     I                C       A                B
     I        C               A         B
     I              A C        B
  30 +              C       A       B
     I             C           A            B
     I              C      A          B
     I          C   A             B
     I           C    A  B
  35 +       C   A     B
     I        C        B A
     I                C   A  B
     I             C      A       B
     I                  C A           B
  40 +                C            B  A
```

```
      I                         C  A     B
      I                 C          A      B
      I              A C                 B
      I            C A                 B
   45 +                  CB  A
      I            C    AB
      I              *           B
      I           C     A  B
      I      C                A       B
   50 +       C      A      B
      I             A  C               B
      I         C     A          B
      I              C  A                  B
      I              C     A       B
   55 +                C   A             B
      I                 C   A             B
      I         C         A         B
      I            C          A      B
      I                C    A       B
   60 +            C A           B
      I       *           B
      I          C   A     B
      I          C      A     B
      I             C  A           B
   65 +           C   A           B
      I          C         A       B
      I          C     A               B
      I            A C                     B
      I         A C               B
   70 +      C             A       B
      I        C         A     B
      I      C      A        B
      I  C           A      B
      I   C                A  B
   75 +      C      A                B
      I       C           A           B
      I      C           A       B
      I      C     A               B
      I    C               A         B
   80 +          C  A            B
      I         C    A     B
      I         C   A              B
      I        C    A          B
      I C         A            B

PAGE   3      INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS GROUP1.
                  MAXLAG IS 25.
                  TIME=1,63./
```

```
NUMBER OF OBSERVATIONS              =          63
MEAN OF THE (DIFFERENCED) SERIES =        68.3492
STANDARD ERROR OF THE MEAN          =       2.6183
T-VALUE OF MEAN (AGAINST ZERO)      =      26.1041

AUTOCORRELATIONS

  1-  8      .64  .46  .42  .41  .35  .31  .26  .31
  ST.E       .13  .17  .19  .20  .22  .22  .23  .24

  9- 12      .28  .23  .22  .15
  ST.E       .24  .25  .25  .25

 13- 20      .12  .19  .21  .15  .10  .15  .07  .01
  ST.E       .26  .26  .26  .26  .26  .26  .26  .26

 21- 25      .04 -.03 -.08 -.10 -.08
  ST.E       .26  .26  .26  .27  .27
PLOT OF SERIAL CORRELATION

   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.642               +     IXXXXX+XXXXXXXXXX
 2  0.460             +       IXXXXXXX+XXXX
 3  0.416            +        IXXXXXXXX+X
 4  0.411           +         IXXXXXXXXXX
 5  0.352          +          IXXXXXXXXX +
 6  0.310          +          IXXXXXXXX  +
 7  0.265          +          IXXXXXXX   +
 8  0.311         +           IXXXXXXXX   +
 9  0.283         +           IXXXXXXX    +
10  0.231         +           IXXXXXX     +
11  0.216         +           IXXXXX      +
12  0.150         +           IXXXX       +
13  0.121        +            IXXX         +
14  0.185        +            IXXXXX       +
15  0.209        +            IXXXXX       +
16  0.150        +            IXXXX        +
17  0.105        +            IXXX         +
18  0.145        +            IXXXX        +
19  0.071        +            IXX          +
20  0.009        +            I            +
21  0.039        +            IX           +
22 -0.030        +           XI            +
23 -0.083        +          XXI            +
24 -0.098        +          XXI            +
25 -0.080        +          XXI            +
```

```
PAGE  4     INTERVENTION ANALYSES FOR MH READMISSIONS

 PACF            VARIABLE IS GROUP1.
                 MAXLAG IS 25.
                 TIME=1,63./

NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         68.3492
STANDARD ERROR OF THE MEAN         =        2.6183
T-VALUE OF MEAN (AGAINST ZERO)    =        26.1041

PARTIAL AUTOCORRELATIONS

  1- 8      .64  .08  .16  .13  .01  .04 -.01  .14
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12    -.02 -.02  .03 -.11
  ST.E      .13  .13  .13  .13

 13- 20     0.0  .13  .06 -.06 -.04  .09 -.17 -.04
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     .11 -.20 -.07 -.01  .02
  ST.E      .13  .13  .13  .13  .13
PLOT OF SERIAL CORRELATION

   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.642               +     IXXXXX+XXXXXXXXXX
 2  0.081               +     IXX   +
 3  0.159               +     IXXXX +
 4  0.130               +     IXXX  +
 5  0.011               +     I     +
 6  0.037               +     IX    +
 7 -0.010               +     I     +
 8  0.144               +     IXXXX +
 9 -0.015               +     I     +
10 -0.017               +     I     +
11  0.028               +     IX    +
12 -0.113               +  XXXI     +
13  0.001               +     I     +
14  0.127               +     IXXX  +
15  0.056               +     IX    +
16 -0.064               +   XXI     +
17 -0.042               +    XI     +
18  0.086               +     IXX   +
19 -0.173               + XXXXI     +
20 -0.044               +    XI     +
```

```
21  0.113              +      IXXX  +
22 -0.201              +XXXXXI      +
23 -0.074              +    XXI     +
24 -0.011              +      I     +
25  0.021              +      IX    +

PAGE   5     INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS GROUP1.
                  DFORDER IS 1.
                  MAXLAG IS 25.
                  TIME=1,63./

NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =          -1.0645
STANDARD ERROR OF THE MEAN          =        2.0798
T-VALUE OF MEAN (AGAINST ZERO)      =       -0.5118


AUTOCORRELATIONS

  1-  8     -.17 -.31 -.09  .09 -.01  .02 -.13  .10
  ST.E       .13  .13  .14  .14  .14  .14  .14  .15

  9- 12      .04 -.10  .10  .01
  ST.E       .15  .15  .15  .15

 13- 20     -.11  .02  .14 -.01 -.10  .02 -.01 -.06
  ST.E       .15  .15  .15  .15  .15  .15  .15  .15

 21- 25      .20  .01 -.08 -.14  .03
  ST.E       .15  .16  .16  .16  .16


PLOT OF SERIAL CORRELATION

   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.167               + XXXXI     +
 2 -0.308              XX+XXXXXI     +
 3 -0.088               +    XXI     +
 4  0.094               +      IXX   +
 5 -0.010               +      I     +
 6  0.020               +      IX    +
 7 -0.129               +   XXXI     +
 8  0.104               +      IXXX  +
 9  0.042               +      IX    +
10 -0.105               +   XXXI     +
```

```
11  0.096            +      IXX     +
12  0.010            +      I       +
13 -0.112            +   XXXI       +
14  0.024            +      IX      +
15  0.139            +      IXXX    +
16 -0.011            +      I       +
17 -0.104            +   XXXI       +
18  0.019           +       I        +
19 -0.011           +       I        +
20 -0.058           +      XI        +
21  0.200           +       IXXXXX   +
22  0.009           +       I        +
23 -0.077           +     XXI        +
24 -0.138           +    XXXI        +
25  0.032           +       IX       +
```

PAGE 6 INTERVENTION ANALYSES FOR MH READMISSIONS

```
 PACF         VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	62
MEAN OF THE (DIFFERENCED) SERIES	=	-1.0645
STANDARD ERROR OF THE MEAN	=	2.0798
T-VALUE OF MEAN (AGAINST ZERO)	=	-0.5118

PARTIAL AUTOCORRELATIONS

1- 8	-.17	-.35	-.25	-.12	-.16	-.07	-.23	-.03
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
9- 12	-.07	-.16	.06	-.05				
ST.E	13	13	13	13				
13- 20	-.11	-.04	.09	.06	-.03	.11	-.02	-.11
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	.25	.13	.12	-.01	.05			
ST.E	.13	.13	.13	.13	.13			

PLOT OF SERIAL CORRELATION

```
   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
```

```
 1 -0.167              + XXXXI     +
 2 -0.345           XXX+XXXXXI     +
 3 -0.251              XXXXXXI     +
 4 -0.123              +  XXXI     +
 5 -0.161              + XXXXI     +
 6 -0.065              +   XXI     +
 7 -0.231              XXXXXXI     +
 8 -0.031              +    XI     +
 9 -0.066              +   XXI     +
10 -0.164              + XXXXI     +
11  0.058              +     IX    +
12 -0.048              +    XI     +
13 -0.106              +  XXXI     +
14 -0.044              +    XI     +
15  0.086              +     IXX   +
16  0.064              +     IXX   +
17 -0.030              +    XI     +
18  0.107              +     IXXX  +
19 -0.021              +    XI     +
20 -0.115              +  XXXI     +
21  0.255              +     IXXXXXX
22  0.135              +     IXXX  +
23  0.124              +     IXXX  +
24 -0.013              +     I     +
25  0.054              +     IX    +

PAGE    7     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP1.
                  DFORDER IS 1.
                  MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE    8     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION      RESIDUAL IS RGROUP1.
                  TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE
```

```
VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       MA      1       1     0.5720

                                  ST  ERR   T-RATIO
                                   0.1096      ·5.22

RESIDUAL SUM OF SQUARES  =     14676.535156
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =       240.598923
```

PAGE 9 INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

```
VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       MA      1       1     0.6938

                                  ST  ERR   T-RATIO
                                   0.0908      7.64

RESIDUAL SUM OF SQUARES  =     13835.359375
                            (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =       226.809158
```

PAGE 10 INTERVENTION ANALYSES FOR MH READMISSIONS

```
  ACF            VARIABLE IS RGROUP1.
                 MAXLAG IS 25.
                 TIME=1,63./

NUMBER OF OBSERVATIONS            =          63
MEAN OF THE (DIFFERENCED) SERIES =      -2.6915
```

```
STANDARD ERROR OF THE MEAN           =          1.8723
T-VALUE OF MEAN (AGAINST ZERO)       =         -1.4375
```

AUTOCORRELATIONS

```
  1-  8      .18 -.23 -.17 -.03 -.06 -.09 -.13  .04
  ST.E       .13  .13  .14  .14  .14  .14  .14  .14

  9- 12      .03 -.05  .02 -.05
  ST.E       .14  .14  .14  .14

 13- 20     -.09  .08  .15  .03 -.05  .06  .01  .01
  ST.E       .14  .14  .15  .15  .15  .15  .15  .15

 21- 25      .18  .02 -.14 -.20 -.07
  ST.E       .15  .15  .15  .15  .16
```

PLOT OF SERIAL CORRELATION

```
   -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.183               +     IXXXXX+
 2 -0.226               XXXXXXI     +
 3 -0.170              +  XXXXI      +
 4 -0.027              +     XI      +
 5 -0.064              +    XXI      +
 6 -0.086              +    XXI      +
 7 -0.130              +   XXXI      +
 8  0.039              +      IX     +
 9  0.026              +      IX     +
10 -0.053              +     XI      +
11  0.020              +      IX     +
12 -0.052              +     XI      +
13 -0.092              +    XXI      +
14  0.076              +      IXX    +
15  0.153              +      IXXXX  +
16  0.032              +      IX     +
17 -0.048              +     XI      +
18  0.061              +      IXX    +
19  0.010              +      I      +
20  0.013              +      I      +
21  0.184              +      IXXXXX +
22  0.018              +      I      +
23 -0.137              +   XXXI      +
24 -0.202             +  XXXXXI       +
25 -0.075             +     XXI       +
```

```
PAGE  11      INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE          MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  12      INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA          VARIABLE IS GROUP1.
                 DFORDER IS 1.
                 MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  13      INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS I1.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  14      INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS I2.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1        I2
PAGE  15      INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION     RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL
```

```
OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )
                                                1
I1         BINARY              1-  84  (1-B   )
                                                1
I2         BINARY              1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1     0.6415
      2  I1            UP      1       0     1.5072
      3  I2            UP      1       0     4.7507

                                   ST  ERR   T-RATIO
                                    0.0889      7.21
                                   11.2190      0.13
                                   11.2014      0.42

RESIDUAL SUM OF SQUARES  =      16440.007813
DEGREES OF FREEDOM       =                80
RESIDUAL MEAN SQUARE     =        205.500092

PAGE  16     INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )
                                                1
I1         BINARY              1-  84  (1-B   )
                                                1
I2         BINARY              1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1     0.7216
      2  I1            UP      1       0     0.2489
```

```
     3  I2            UP       1       0      2.9444

                                    ST  ERR   T-RATIO
                                     0.0767      9.40
                                     9.7447      0.03
                                     9.6824      0.30

RESIDUAL SUM OF SQUARES  =      15522.871094
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                80 ·
RESIDUAL MEAN SQUARE     =       194.035889

PAGE  17     INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS IGROUP1.
                  MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =            84
MEAN OF THE (DIFFERENCED) SERIES    =       -2.5568
STANDARD ERROR OF THE MEAN          =        1.4816
T-VALUE OF MEAN (AGAINST ZERO)      =       -1.7257


AUTOCORRELATIONS

  1-  8      .15 -.21 -.13 -.02 -.08 -.09 -.10  .07
  ST.E       .11  .11  .12  .12  .12  .12  .12  .12

  9- 12      .02 -.09  .02 -.03
  ST.E       .12  .12  .12  .12

 13- 20     -.09  .05  .12  .03  0.0  .07  0.0 -.01
  ST.E       .12  .12  .12  .12  .12  .12  .12  .12

 21- 25      .21  .03 -.15 -.20 -.01
  ST.E       .12  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.155               +    IXXXX+
 2 -0.210               XXXXXI    +
 3 -0.130              +  XXXI     +
 4 -0.019              +     I     +
 5 -0.085              +   XXI     +
 6 -0.090              +   XXI     +
```

```
 7 -0.102          +  XXXI     +
 8  0.067          +     IXX   +
 9  0.019          +     I     +
10 -0.085          +   XXI     +
11  0.021          +     IX    +
12 -0.029          +    XI     +
13 -0.087          +   XXI     +
14  0.050          +     IX    +
15  0.123          +     IXXX  +
16  0.035          +     IX    +
17 -0.001          +     I     +
18  0.069          +     IXX   +
19 -0.001          +     I     +
20 -0.008          +     I     +
21  0.206          +     IXXXXX+
22  0.026          +     IX    +
23 -0.154          + XXXXI     +
24 -0.195          +XXXXXI     +
25 -0.005          +     I     +

PAGE  18     INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE           MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  19     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP1.
                  DFORDER IS 1.
                  MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  20     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS I1.
                  DFORDER IS 1.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  21     INTERVENTION ANALYSES FOR MH READMISSIONS
```

```
  INDEP          VARIABLE IS I2.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  22     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS CLOSE.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  23     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION     RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES
                                            1
GROUP1     RANDOM            1-  84   (1-B  )
                                            1
I1         BINARY            1-  84   (1-B  )
                                            1
I2         BINARY            1-  84   (1-B  )
                                            1
CLOSE      BINARY            1-  84   (1-B  )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1     0.6614
      2  I1            UP      1       0     6.2644
      3  I2            UP      1       0     4.3198
```

4	CLOSE	UP	1	0	-17.2975

ST ERR	T-RATIO
0.0877	7.54
11.3333	0.55
10.8238	0.40
11.2996	-1.53

RESIDUAL SUM OF SQUARES = 15963.289063
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 202.066940

PAGE 24 INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MA	1	1	0.7331
2	I1	UP	1	0	6.6473
3	I2	UP	1	0	2.7178
4	CLOSE	UP	1	0	-16.7993

ST ERR	T-RATIO
0.0757	9.69
10.2743	0.65
9.4254	0.29
10.2389	-1.64

RESIDUAL SUM OF SQUARES = 15004.730469
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79

```
RESIDUAL MEAN SQUARE        =        189.933289

PAGE  25      INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS IGROUP1.
                  MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =             84
MEAN OF THE (DIFFERENCED) SERIES =            -2.1744
STANDARD ERROR OF THE MEAN          =            1.4641
T-VALUE OF MEAN (AGAINST ZERO)      =           -1.4851


AUTOCORRELATIONS

  1-  8      .15 -.21 -.11  .01 -.05 -.08 -.09  .09
  ST.E       .11  .11  .12  .12  .12  .12  .12  .12

  9- 12      .05 -.09  0.0 -.02
  ST.E       .12  .12  .12  .12

 13- 20     -.07  .05  .12  .04 -.02  .04 -.03  0.0
  ST.E       .12  .12  .12  .12  .12  .12  .12  .12

 21- 25      .26  .06 -.13 -.18  .01
  ST.E       .12  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.152                +    IXXXX+
 2 -0.209                XXXXXI    +
 3 -0.109               +  XXXI     +
 4  0.009               +     I     +
 5 -0.055               +    XI     +
 6 -0.085               +   XXI     +
 7 -0.089               +   XXI     +
 8  0.091               +     IXX   +
 9  0.052               +     IX    +
10 -0.091               +   XXI     +
11  0.002               +     I     +
12 -0.020               +    XI     +
13 -0.065               +   XXI     +
14  0.052               +     IX    +
15  0.118               +     IXXX  +
16  0.038               +     IX    +
```

```
17 -0.023             +    XI     +
18  0.042             +     IX    +
19 -0.030             +    XI     +
20 -0.002             +     I     +
21  0.259             +     IXXXXXX
22  0.064             +     IXX   +
23 -0.129             +  XXXI     +
24 -0.182             +XXXXXI     +
25  0.010            +      I      +

PAGE  26     INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE           MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  27     INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS GROUP2.
                  MAXLAG IS 25.
                  TIME=1,63./

NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =          83.9048
STANDARD ERROR OF THE MEAN          =        1.9301
T-VALUE OF MEAN (AGAINST ZERO)      =       43.4711


AUTOCORRELATIONS

  1-  8      .45  .32  0.0 -.06 -.04 -.10 -.14 -.25
  ST.E       .13  .15  .16  .16  .16  .16  .16  .16

  9- 12     -.04  .10  .28  .34
  ST.E       .17  .17  .17  .18

 13- 20      .17  .14  .12  .16  .02 -.20 -.35 -.35
  ST.E       .19  .19  .19  .19  .20  .20  .20  .21

 21- 25     -.15  .02  .04  .08  .07
  ST.E       .22  .22  .22  .22  .22


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 0.453              +        IXXXXX+XXXXX
 2 0.324             +         IXXXXXX+X
```

```
 3 -0.004           +       I       +
 4 -0.061           +     XXI       +
 5 -0.039           +      XI       +
 6 -0.097           +     XXI       +
 7 -0.140           +   XXXXI       +
 8 -0.252           + XXXXXXI       +
 9 -0.036           +      XI       +
10  0.097           +       IXX     +
11  0.285           +       IXXXXXXX+
12  0.340          +        IXXXXXXXXX+
13  0.170          +        IXXXXX    +
14  0.140          +        IXXXX     +
15  0.121          +        IXXXX     +
16  0.164          +        IXXXXX    +
17  0.016         +         I          +
18 -0.201         +    XXXXXI          +
19 -0.350         +XXXXXXXXXXI         +
20 -0.352         +XXXXXXXXXXI         +
21 -0.153        +      XXXXI           +
22  0.016        +          I           +
23  0.043        +          IX          +
24  0.083        +          IXX         +
25  0.067        +          IXX         +
```

PAGE 28   INTERVENTION ANALYSES FOR MH READMISSIONS

```
  PACF          VARIABLE IS GROUP2.
                MAXLAG IS 25.
                TIME=1,63./

NUMBER OF OBSERVATIONS              =          63
MEAN OF THE (DIFFERENCED) SERIES =        83.9048
STANDARD ERROR OF THE MEAN          =      1.9301
T-VALUE OF MEAN (AGAINST ZERO)      =     43.4711
```

PARTIAL AUTOCORRELATIONS

```
  1-  8     .45  .15 -.25 -.03  .11 -.12 -.14 -.14
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     .25  .17  .08  .13
  ST.E      .13  .13  .13  .13

 13- 20    -.09  .03  .15  .06 -.15 -.25 -.08  .02
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     0.0  .05 -.09  .04  .04
  ST.E      .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.453                 +    IXXXXX+XXXXX
 2  0.149                 +    IXXXX +
 3 -0.253                 XXXXXXI     +
 4 -0.034                 +   XI      +
 5  0.110                 +    IXXX   +
 6 -0.123                 +  XXXI     +
 7 -0.145                 + XXXXI     +
 8 -0.139                 +  XXXI     +
 9  0.255                 +    IXXXXXX
10  0.174                 +    IXXXX +
11  0.081                 +    IXX    +
12  0.133                 +    IXXX   +
13 -0.094                 +   XXI     +
14  0.032                 +    IX     +
15  0.153                 +    IXXXX +
16  0.064                 +    IXX    +
17 -0.152                 + XXXXI     +
18 -0.255                 XXXXXXI     +
19 -0.078                 +   XXI     +
20  0.020                 +    I      +
21 -0.001                 +    I      +
22  0.054                 +    IX     +
23 -0.092                 +   XXI     +
24  0.043                 +    IX     +
25  0.043                 +    IX     +
```

PAGE 29   INTERVENTION ANALYSES FOR MH READMISSIONS

```
  ACF           VARIABLE IS GROUP2.
                DFORDER IS 12.
                MAXLAG IS 25.
                TIME=1,63./
```

```
NUMBER OF OBSERVATIONS           =          51
MEAN OF THE (DIFFERENCED) SERIES =     -1.5098
STANDARD ERROR OF THE MEAN       =      2.4561
T-VALUE OF MEAN (AGAINST ZERO)   =     -0.6147
```

AUTOCORRELATIONS

```
  1- 8      .34  .32 -.05 -.05  .04  .08  .12 -.05
  ST.E      .14  .16  .17  .17  .17  .17  .17  .17
```

```
  9- 12      .08 -.07  .11 -.26
  ST.E       .17  .17  .17  .17

 13- 20     -.14 -.23 -.15  .07 -.15 -.13 -.35 -.22
  ST.E       .18  .18  .19  .19  .19  .19  .20  .21

 21- 25     -.14 -.03 -.07 -.06 -.04
  ST.E       .21  .21  .21  .21  .21


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.337             +      IXXXXXX+X
 2  0.317            +       IXXXXXXXX
 3 -0.055            +      XI       +
 4 -0.046            +      XI       +
 5  0.042            +       IX      +
 6  0.077            +       IXX     +
 7  0.117            +       IXXX    +
 8 -0.049            +      XI       +
 9  0.083            +       IXX     +
10 -0.067            +     XXI       +
11  0.112            +       IXXX    +
12 -0.261            +XXXXXXXI       +
13 -0.145           +    XXXXI        +
14 -0.227           +  XXXXXXI        +
15 -0.153           +    XXXXI        +
16  0.073           +        IXX      +
17 -0.151           +    XXXXI        +
18 -0.127          +      XXXI         +
19 -0.351          +XXXXXXXXXI         +
20 -0.216          +    XXXXXI         +
21 -0.137          +      XXXI         +
22 -0.028          +        XI         +
23 -0.070          +       XXI         +
24 -0.058          +        XI         +
25 -0.037         +         XI          +

PAGE  30     INTERVENTION ANALYSES FOR MH READMISSIONS

  PACF           VARIABLE IS GROUP2.
                 DFORDER IS 12.
                 MAXLAG IS 25.
                 TIME=1,63./

NUMBER OF OBSERVATIONS          =             51
```

```
MEAN OF THE (DIFFERENCED) SERIES =          -1.5098
STANDARD ERROR OF THE MEAN       =           2.4561
T-VALUE OF MEAN (AGAINST ZERO)   =          -0.6147
```

PARTIAL AUTOCORRELATIONS

```
  1-  8     .34  .23 -.26 -.05  .21  .04 -.02 -.14
  ST.E      .14  .14  .14  .14  .14  .14  .14  .14

  9- 12     .18 -.05  .04 -.40
  ST.E      .14  .14  .14  .14

 13- 20     0.0  .11 -.12  .08 -.26 -.13 -.04 -.09
  ST.E      .14  .14  .14  .14  .14  .14  .14  .14

 21- 25     .10 -.17 -.04  .03  .02
  ST.E      .14  .14  .14  .14  .14
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I      .
 1  0.337             +      IXXXXXX+X
 2  0.229             +      IXXXXXX+
 3 -0.256             +XXXXXXI      +
 4 -0.045             +     XI      +
 5  0.210             +      IXXXXX +
 6  0.037             +      IX     +
 7 -0.023             +     XI      +
 8 -0.137             +   XXXI      +
 9  0.182             +      IXXXXX +
10 -0.047             +     XI      +
11  0.042             +      IX     +
12 -0.401          XXX+XXXXXXI      +
13 -0.002             +      I      +
14  0.110             +      IXXX   +
15 -0.124             +   XXXI      +
16  0.078             +      IXX    +
17 -0.259             +XXXXXXI      +
18 -0.134             +   XXXI      +
19 -0.044             +     XI      +
20 -0.086             +    XXI      +
21  0.105             +      IXXX   +
22 -0.167             +  XXXXI      +
23 -0.035             +     XI      +
24  0.026             +      IX     +
```

```
25  0.019                +       I       +

PAGE  31      INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA             VARIABLE IS GROUP2.
                    DFORDER IS 12.
                    ARORDER IS '(1),(12)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  32      INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION        RESIDUAL IS RGROUP2.
                    TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE   VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                12
GROUP2     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       AR      1       1     0.4200
      2  GROUP2       AR      2      12    -0.4169

                                     ST  ERR   T-RATIO
                                      0.1626      2.58
                                      0.1666     -2.50

RESIDUAL SUM OF SQUARES  =      9459.546875
DEGREES OF FREEDOM       =               36
RESIDUAL MEAN SQUARE     =       262.765137

PAGE  33      INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
```

LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{12})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	AR	1	1	0.4265	0.1418	3.01
2	GROUP2	AR	2	12	-0.4122	0.1607	-2.56

RESIDUAL SUM OF SQUARES = 9460.406250
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 36
RESIDUAL MEAN SQUARE = 262.789063

PAGE 34 INTERVENTION ANALYSES FOR MH READMISSIONS

ACF VARIABLE IS RGROUP2.
MAXLAG IS 25.
TIME=1,63./

NUMBER OF OBSERVATIONS = 63
MEAN OF THE (DIFFERENCED) SERIES = -1.1789
STANDARD ERROR OF THE MEAN = 1.7404
T-VALUE OF MEAN (AGAINST ZERO) = -0.6773

AUTOCORRELATIONS

1- 12	-.06	.22	-.23	-.01	.02	.11	.07	-.23
ST.E	.13	.13	.13	.14	.14	.14	.14	.14
9- 12	.11	-.10	.29	-.07				
ST.E	.15	.15	.15	.16				
13- 24	.01	-.17	-.10	.19	-.09	.04	-.26	-.10
ST.E	.16	.16	.16	.16	.17	.17	.17	.17
21- 25	-.04	.02	-.03	-.14	0.0			
ST.E	.17	.17	.17	.17	.18			

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 -0.061                 +  XXI    +
 2  0.218                 +    IXXXXX+
 3 -0.234                 XXXXXXI   +
 4 -0.015                +     I     +
 5  0.022                +     IX    +
 6  0.108                +     IXXX  +
 7  0.069                +     IXX   +
 8 -0.234                +XXXXXXI    +
 9  0.114                +     IXXX  +
10 -0.102                +  XXXI     +
11  0.292                +     IXXXXXXX
12 -0.067               +    XXI      +
13  0.007               +      I      +
14 -0.166               +   XXXXI     +
15 -0.096               +    XXI      +
16  0.193               +      IXXXXX +
17 -0.090               +    XXI      +
18  0.036               +      IX     +
19 -0.264               +XXXXXXXI     +
20 -0.101               +   XXXI      +
21 -0.042              +      XI       +
22  0.023              +       IX      +
23 -0.034              +      XI       +
24 -0.141              +    XXXXI      +
25 -0.002              +       I       +

PAGE  35      INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE           MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  36      INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP2.
                  DFORDER IS 12.
                  ARORDER IS '(1),(12)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  37      INTERVENTION ANALYSES FOR MH READMISSIONS
```

```
  INDEP           VARIABLE IS I1.
                  DFORDER IS 12.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  38     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS I2.
                  DFORDER IS 12.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2
PAGE  39     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION      RESIDUAL=IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.0000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                             12
GROUP2      RANDOM             1-  84   (1-B   )
                                             12
I1          BINARY             1-  84   (1-B   )
                                             12
I2          BINARY             1-  84   (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2        AR      1       1     0.3711
      2  GROUP2        AR      2      12    -0.3634
      3  I1            UP      1       0    -0.1185
      4  I2            UP      1       0    -5.5986
```

	ST ERR	T-RATIO
	0.1315	2.82
	0.1230	-2.95
	6.2434	-0.02
	7.2638	-0.77

RESIDUAL SUM OF SQUARES = 11362.527344
DEGREES OF FREEDOM = 55
RESIDUAL MEAN SQUARE = 206.591400

PAGE 40 INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{12})$
I1	BINARY		1- 84	$(1-B^{12})$
I2	BINARY		1- 84	$(1-B^{12})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	AR	1	1	0.3869
2	GROUP2	AR	2	12	-0.3710
3	I1	UP	1	0	-0.1317
4	I2	UP	1	0	-5.5689

	ST ERR	T-RATIO
	0.1177	3.29
	0.1177	-3.15
	5.1639	-0.03
	7.8539	-0.71

RESIDUAL SUM OF SQUARES = 11366.046875
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 55
RESIDUAL MEAN SQUARE = 206.655396

PAGE 41 INTERVENTION ANALYSES FOR MH READMISSIONS

```
ACF              VARIABLE IS IGROUP2.
                 MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =              84
MEAN OF THE (DIFFERENCED) SERIES =            -0.9731
STANDARD ERROR OF THE MEAN          =          1.4026
T-VALUE OF MEAN (AGAINST ZERO)      =         -0.6938


AUTOCORRELATIONS

  1-  8     -.06  .23 -.25  .03 -.05  .14  0.0 -.14
  ST.E       .11  .11  .11  .12  .12  .12  .12  .12

  9- 12      .07 -.04  .25 -.08
  ST.E       .13  .13  .13  .13

 13- 20     -.05 -.17 -.04  .18 -.01  0.0 -.21 -.08
  ST.E       .13  .13  .14  .14  .14  .14  .14  .14

 21- 25     -.04 -.02 -.03 -.23  0.0
  ST.E       .14  .14  .14  .14  .15


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.063                +  XXI    +
 2  0.227                +    IXXXX+X
 3 -0.253               XXXXXXI     +
 4  0.030               +     IX    +
 5 -0.054               +    XI     +
 6  0.139               +     IXXX  +
 7  0.001               +     I     +
 8 -0.145               + XXXXI     +
 9  0.073               +     IXX   +
10 -0.042               +    XI     +
11  0.252               +     IXXXXXX
12 -0.080               +   XXI     +
13 -0.055              +     XI      +
14 -0.168              +  XXXXI      +
15 -0.043              +     XI      +
16  0.180              +      IXXXXX +
17 -0.012              +      I      +
18  0.004              +      I      +
19 -0.209              + XXXXXI      +
20 -0.085              +    XXI      +
```

```
21 -0.043              +     XI     +
22 -0.016              +      I     +
23 -0.029              +     XI     +
24 -0.228              +XXXXXXI     +
25  0.005              +      I     +

PAGE  42     INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE           MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  43     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP2.
                  DFORDER IS 12.
                  ARORDER IS '(1),(12)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  44     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS I1.
                  DFORDER IS 12.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  45     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS I2.
                  DFORDER IS 12.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2
PAGE  46     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS CLOSE.
                  DFORDER IS 12.
```

```
                    UPORDER IS '(0)'.
                    TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1        I2        CLOSE
PAGE  47     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION      RESIDUAL=IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE     I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                               12
GROUP2     RANDOM                1-  84   (1-B   )
                                               12
I1         BINARY                1-  84   (1-B   )
                                               12
I2         BINARY                1-  84   (1-B   )
                                               12
CLOSE      BINARY                1-  84   (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1   GROUP2       AR      1       1      0.3678
      2   GROUP2       AR      2      12     -0.3326
      3   I1           UP      1       0     13.8392
      4   I2           UP      1       0     -3.2735
      5   CLOSE        UP      1       0    -18.6890

                                   ST  ERR   T-RATIO
                                    0.1320      2.79
                                    0.1243     -2.68
                                    9.0402      1.53
                                    7.0663     -0.46
                                    9.1071     -2.05

RESIDUAL SUM OF SQUARES   =     10527.417969
DEGREES OF FREEDOM        =               54
RESIDUAL MEAN SQUARE      =       194.952179
```

PAGE 48 INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{12})$
I1	BINARY		1- 84	$(1-B^{12})$
I2	BINARY		1- 84	$(1-B^{12})$
CLOSE	BINARY		1- 84	$(1-B^{12})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	AR	1	1	0.3829	0.1165	3.29
2	GROUP2	AR	2	12	-0.2905	0.1140	-2.55
3	I1	UP	1	0	13.9370	8.9728	1.55
4	I2	UP	1	0	-3.0824	7.1560	-0.43
5	CLOSE	UP	1	0	-19.0298	9.0570	-2.10

RESIDUAL SUM OF SQUARES = 10556.511719
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 54
RESIDUAL MEAN SQUARE = 195.490952

PAGE 49 INTERVENTION ANALYSES FOR MH READMISSIONS

ACF VARIABLE IS IGROUP2.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = -0.3197
STANDARD ERROR OF THE MEAN = 1.3706

T-VALUE OF MEAN (AGAINST ZERO) = -0.2332

AUTOCORRELATIONS

```
  1- 8     -.07  .24 -.21  .04 -.01  .16  .04 -.11
  ST.E      .11  .11  .12  .12  .12  .12  .12  .12

  9- 12     .09 -.05  .22 -.10
  ST.E      .12  .13  .13  .13

 13- 20    -.03 -.11 -.05  .14 -.10 -.06 -.23 -.06
  ST.E      .13  .13  .13  .13  .13  .14  .14  .14

 21- 25    -.01 -.03 -.04 -.25 -.02
  ST.E      .14  .14  .14  .14  .15
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.065               +  XXI    +
 2  0.239               +    IXXXX+X
 3 -0.214              +XXXXXI     +
 4  0.044              +     IX    +
 5 -0.006              +     I     +
 6  0.162              +     IXXXX +
 7  0.042              +     IX    +
 8 -0.111              +  XXXI     +
 9  0.089              +     IXX   +
10 -0.049              +    XI     +
11  0.220              +     IXXXXXX
12 -0.105              +  XXXI     +
13 -0.030              +    XI     +
14 -0.112              +  XXXI     +
15 -0.050              +    XI     +
16  0.144              +     IXXXX +
17 -0.096             +    XXI      +
18 -0.063             +    XXI      +
19 -0.227             +XXXXXXI      +
20 -0.065             +    XXI      +
21 -0.011             +      I      +
22 -0.032             +     XI      +
23 -0.040             +     XI      +
24 -0.249             +XXXXXXI      +
25 -0.021             +     XI      +
```

```
PAGE  50    INTERVENTION ANALYSES FOR MH READMISSIONS

 ERASE          MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  51    INTERVENTION ANALYSES FOR MH READMISSIONS

 ACF            VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./

NUMBER OF OBSERVATIONS           =             63
MEAN OF THE (DIFFERENCED) SERIES =        45.2698
STANDARD ERROR OF THE MEAN       =         1.2040
T-VALUE OF MEAN (AGAINST ZERO)   =        37.5989


AUTOCORRELATIONS

 1-  8     .35  .29  .07  .11 -.04 -.12 -.19 -.12
 ST.E      .13  .14  .15  .15  .15  .15  .15  .16

 9- 12    -.10  .04  .02  .11
 ST.E      .16  .16  .16  .16

13- 20     .04  .21  .08  .06 -.03  0.0 -.03 -.12
 ST.E      .16  .16  .17  .17  .17  .17  .17  .17

21- 25     0.0  .07 -.03  .06  .03
 ST.E      .17  .17  .17  .17  .17


PLOT OF SERIAL CORRELATION

 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.347                +     IXXXXX+XXX
 2  0.288               +      IXXXXXXX
 3  0.074               +      IXX    +
 4  0.108               +      IXXX   +
 5 -0.037               +     XI      +
 6 -0.123               +   XXXI      +
 7 -0.191               + XXXXXI      +
 8 -0.116              +    XXXI       +
 9 -0.105              +    XXXI       +
10  0.044              +       IX      +
11  0.019              +       I       +
12  0.109              +       IXXX    +
```

```
13  0.037           +        IX      +
14  0.211           +        IXXXXX  +
15  0.076           +        IXX     +
16  0.057           +        IX      +
17 -0.033           +       XI       +
18 -0.001           +        I       +
19 -0.029           +       XI       +
20 -0.121           +     XXXI       +
21  0.002           +        I       +
22  0.070           +        IXX     +
23 -0.029           +       XI       +
24  0.059           +        IX      +
25  0.031           +        IX      +

PAGE  52     INTERVENTION ANALYSES FOR MH READMISSIONS

  PACF           VARIABLE IS GROUP3.
                 MAXLAG IS 25.
                 TIME=1,63./

NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =         45.2698
STANDARD ERROR OF THE MEAN          =          1.2040
T-VALUE OF MEAN (AGAINST ZERO)      =         37.5989


PARTIAL AUTOCORRELATIONS

  1- 12      .35  .19 -.09  .06 -.09 -.15 -.10  .02
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.01  .13  .01  .05
  ST.E       .13  .13  .13  .13

 13- 24     -.05  .16 -.05 -.05 -.01  .01  .02 -.11
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25      .16  .10 -.13  .06  .02
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.347           +         IXXXXX+XXX
 2  0.190           +         IXXXXX+
 3 -0.086           +       XXI     +
```

```
 4  0.064              +      IXX    +
 5 -0.092              +    XXI      +
 6 -0.145              + XXXXI       +
 7 -0.100              +  XXXI       +
 8  0.022              +      IX     +
 9 -0.006              +      I      +
10  0.135              +      IXXX   +
11  0.014              +      I      +
12  0.049              +      IX     +
13 -0.051              +     XI      +
14  0.156              +      IXXXX  +
15 -0.053              +     XI      +
16 -0.049              +     XI      +
17 -0.007              +      I      +
18  0.009              +      I      +
19  0.016              +      I      +
20 -0.109              +  XXXI       +
21  0.159              +      IXXXX  +
22  0.101              +      IXXX   +
23 -0.135              +  XXXI       +
24  0.056              +      IX     +
25  0.018              +      I      +

PAGE  53     INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS GROUP3.
                  DFORDER IS 1.
                  MAXLAG IS 25.
                  TIME=1,63./

NUMBER OF OBSERVATIONS            =           62
MEAN OF THE (DIFFERENCED) SERIES =       -0.2581
STANDARD ERROR OF THE MEAN        =        1.3845
T-VALUE OF MEAN (AGAINST ZERO)    =       -0.1864


AUTOCORRELATIONS

  1-  8     -.45  .10 -.18  .16 -.07 -.01 -.08  .05
  ST.E       .13  .15  .15  .16  .16  .16  .16  .16

  9- 12     -.12  .14 -.10  .14
  ST.E       .16  .16  .16  .16

 13- 20     -.22  .23 -.07  .07 -.10  .05  .03 -.15
  ST.E       .17  .17  .18  .18  .18  .18  .18  .18

 21- 25      .05  .16 -.17  .09 -.18
  ST.E       .18  .18  .18  .19  .19
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.455          XXXXX+XXXXXI     +
 2  0.097              +      IXX    +
 3 -0.179              +  XXXXI      +
 4  0.156             +       IXXXX   +
 5 -0.065             +     XXI       +
 6 -0.013             +       I       +
 7 -0.084             +     XXI       +
 8  0.050             +       IX      +
 9 -0.122             +    XXXI       +
10  0.137             +       IXXX    +
11 -0.101             +    XXXI       +
12  0.142             +       IXXXX   +
13 -0.224             + XXXXXXI       +
14  0.234             +       IXXXXXX +
15 -0.071            +      XXI        +
16  0.071            +        IXX      +
17 -0.105            +     XXXI        +
18  0.054            +        IX       +
19  0.033            +        IX       +
20 -0.151            +    XXXXI        +
21  0.051            +        IX       +
22  0.163            +        IXXXX    +
23 -0.173            +    XXXXI        +
24  0.088            +        IXX      +
25 -0.176            +    XXXXI        +

PAGE  54     INTERVENTION ANALYSES FOR MH READMISSIONS

  PACF           VARIABLE IS GROUP3.
                 DFORDER IS 1.
                 MAXLAG IS 25.
                 TIME=1,63./

NUMBER OF OBSERVATIONS             =           62
MEAN OF THE (DIFFERENCED) SERIES =        -0.2581
STANDARD ERROR OF THE MEAN         =        1.3845
T-VALUE OF MEAN (AGAINST ZERO)     =       -0.1864


PARTIAL AUTOCORRELATIONS

  1-  8     -.45 -.14 -.25 -.04 -.03 -.08 -.15 -.11
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13
```

```
 9- 12     -.25 -.09 -.14 -.02
 ST.E       .13  .13  .13  .13

13- 20     -.25 -.06 -.03 -.04 -.07 -.08  .02 -.25
 ST.E       .13  .13  .13  .13  .13  .13  .13  .13

21- 25     -.17  .11 -.07 -.02 -.18
 ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 -0.455            XXXXX+XXXXXI     +
 2 -0.139                 +  XXXI     +
 3 -0.247                 XXXXXXI     +
 4 -0.039                 +     XI    +
 5 -0.026                 +     XI    +
 6 -0.084                 +    XXI    +
 7 -0.149                 + XXXXI     +
 8 -0.107                 +  XXXI     +
 9 -0.248                 XXXXXXI     +
10 -0.094                 +    XXI    +
11 -0.144                 + XXXXI     +
12 -0.018                 +      I    +
13 -0.246                 XXXXXXI     +
14 -0.055                 +     XI    +
15 -0.033                 +     XI    +
16 -0.039                 +     XI    +
17 -0.067                 +    XXI    +
18 -0.078                 +    XXI    +
19  0.021                 +      IX   +
20 -0.246                 XXXXXXI     +
21 -0.166                 + XXXXI     +
22  0.107                 +      IXXX +
23 -0.075                 +    XXI    +
24 -0.020                 +      I    +
25 -0.180                 + XXXXI     +

PAGE  55     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP3.
                  DFORDER IS 1.
                  MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL
```

```
THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  56     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION     RESIDUAL IS RGROUP3.
                 TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                            1
GROUP3     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MA      1       1     0.6711

                                     ST  ERR   T-RATIO
                                      0.0970     6.92

RESIDUAL SUM OF SQUARES  =       5344.945313
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =         87.622040

PAGE  57     INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                            1
GROUP3     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
```

```
     1  GROUP3      MA       1       1      0.6791

                                    ST  ERR   T-RATIO
                                     0.0951      7.14

RESIDUAL SUM OF SQUARES  =       5340.597656
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =         87.550781

PAGE  58     INTERVENTION ANALYSES FOR MH READMISSIONS

  ACF             VARIABLE IS RGROUP3.
                  MAXLAG IS 25.
                  TIME=1,63./

NUMBER OF OBSERVATIONS              =             63
MEAN OF THE (DIFFERENCED) SERIES =           -0.6750
STANDARD ERROR OF THE MEAN          =          1.1663
T-VALUE OF MEAN (AGAINST ZERO)      =         -0.5787


AUTOCORRELATIONS

  1-  8      .07  .07 -.12  .03 -.13 -.18 -.22 -.13
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14

  9- 12     -.15  .04 -.04  .09
  ST.E       .14  .14  .15  .15

 13- 20     -.06  .22  .07  .07 -.06  .01 -.03 -.14
  ST.E       .15  .15  .15  .15  .15  .15  .15  .15

 21- 25      .04  .13 -.09  .02 -.04
  ST.E       .16  .16  .16  .16  .16


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                  I
 1  0.071                 +       IXX    +
 2  0.073                 +       IXX    +
 3 -0.120                 +   XXXI       +
 4  0.029                 +       IX     +
 5 -0.128                 +   XXXI       +
 6 -0.177                 +  XXXXI       +
 7 -0.222                 +XXXXXXI        +
```

```
 8 -0.128            +   XXXI      +
 9 -0.152            +  XXXXI      +
10  0.039            +      IX     +
11 -0.036            +     XI      +
12  0.087            +      IXX    +
13 -0.063            +    XXI      +
14  0.222            +      IXXXXXXX+
15  0.066            +      IXX    +
16  0.067            +      IXX    +
17 -0.059            +     XI      +
18  0.014            +      I      +
19 -0.026           +      XI       +
20 -0.136           +    XXXI       +
21  0.042           +       IX      +
22  0.126           +       IXXX    +
23 -0.093           +     XXI       +
24  0.023           +       IX      +
25 -0.041           +      XI       +

PAGE  59     INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE           MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  60     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA           VARIABLE IS GROUP3.
                  DFORDER IS 1.
                  MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  61     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP           VARIABLE IS I1.
                  DFORDER IS 1.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  62     INTERVENTION ANALYSES FOR MH READMISSIONS
```

```
  INDEP           VARIABLE IS I2.
                  DFORDER IS 1.
                  UPORDER IS '(0)'.
                  TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  63     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION      RESIDUAL=IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN     TIME      DIFFERENCES
                                              1
GROUP3     RANDOM             1-  84  (1-B   )
                                              1
I1         BINARY             1-  84  (1-B   )
                                              1
I2         BINARY             1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3        MA      1       1     0.6097
      2  I1            UP      1       0     2.8588
      3  I2            UP      1       0     4.0057

                                ST  ERR   T-RATIO
                                 0.0913      6.68
                                 7.2230      0.40
                                 7.2202      0.55

RESIDUAL SUM OF SQUARES   =      6528.605469
DEGREES OF FREEDOM        =               80
RESIDUAL MEAN SQUARE      =        81.607559

PAGE  64     INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD
```

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	$(1-B^1)$
I1	BINARY		1- 84	$(1-B^1)$
I2	BINARY		1- 84	$(1-B^1)$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MA	1	1	0.6103	0.0907	6.73
2	I1	UP	1	0	2.8303	7.2012	0.39
3	I2	UP	1	0	4.0018	7.2001	0.56

RESIDUAL SUM OF SQUARES = 6522.687500
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 81.533585

PAGE 65 INTERVENTION ANALYSES FOR MH READMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = -1.0047
STANDARD ERROR OF THE MEAN = 0.9611
T-VALUE OF MEAN (AGAINST ZERO) = -1.0453

AUTOCORRELATIONS

1- 8	.04	.01	-.13	.02	-.06	-.13	-.21	-.10
ST.E	.11	.11	.11	.11	.11	.11	.11	.12
9- 12	-.08	.04	-.04	.15				
ST.E	.12	.12	.12	.12				

```
13- 20      0.0   .17   .01   .03  -.02  -.01  -.13  -.16
 ST.E       .12   .12   .12   .12   .12   .12   .12   .13

21- 25      .08   .13  -.03   .08  -.05
 ST.E       .13   .13   .13   .13   .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.043                +    IX   +
 2  0.012                +    I    +
 3 -0.130                + XXXI    +
 4  0.021                +    IX   +
 5 -0.062                +  XXI    +
 6 -0.131                + XXXI    +
 7 -0.205               +XXXXXI     +
 8 -0.099               +   XXI     +
 9 -0.077               +   XXI     +
10  0.038               +     IX    +
11 -0.044               +    XI     +
12  0.147               +     IXXXX +
13  0.003               +     I     +
14  0.175               +     IXXXX +
15  0.009               +     I     +
16  0.033               +     IX    +
17 -0.022               +    XI     +
18 -0.012               +     I     +
19 -0.131               +  XXXI     +
20 -0.163               + XXXXI     +
21  0.080               +     IXX   +
22  0.133               +     IXXX  +
23 -0.025               +    XI     +
24  0.076               +     IXX   +
25 -0.048               +    XI     +

PAGE   66     INTERVENTION ANALYSES FOR MH READMISSIONS

  ERASE            MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE   67     INTERVENTION ANALYSES FOR MH READMISSIONS

  ARIMA            VARIABLE IS GROUP3.
                   DFORDER IS 1.
                   MAORDER IS '(1)'./
```

```
THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  68     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS I1.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  69     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS I2.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2
PAGE  70     INTERVENTION ANALYSES FOR MH READMISSIONS

  INDEP          VARIABLE IS CLOSE.
                 DFORDER IS 1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  71     INTERVENTION ANALYSES FOR MH READMISSIONS

  ESTIMATION     RESIDUAL=IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL
```

```
OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                             1
GROUP3     RANDOM            1-  84  (1-B   )
                                             1
I1         BINARY            1-  84  (1-B   )
                                             1
I2         BINARY            1-  84  (1-B   )
                                             1
CLOSE      BINARY            1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3        MA      1       1      0.6243
      2  I1            UP      1       0      5.5025
      3  I2            UP      1       0      3.8683
      4  CLOSE         UP      1       0    -12.0074

                               ST  ERR   T-RATIO
                                0.0905      6.90
                                7.2306      0.76
                                7.0598      0.55
                                7.2163     -1.66

RESIDUAL SUM OF SQUARES   =      6308.152344
DEGREES OF FREEDOM        =               79
RESIDUAL MEAN SQUARE      =        79.850021

PAGE  72     INTERVENTION ANALYSES FOR MH READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                             1
GROUP3     RANDOM            1-  84  (1-B   )
                                             1
I1         BINARY            1-  84  (1-B   )
                                             1
I2         BINARY            1-  84  (1-B   )
                                             1
```

CLOSE BINARY 1- 84 (1-B)

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MA	1	1	0.6255	0.0897	6.97
2	I1	UP	1	0	5.4623	7.2088	0.76
3	I2	UP	1	0	3.8607	7.0345	0.55
4	CLOSE	UP	1	0	-11.9884	7.1947	-1.67

RESIDUAL SUM OF SQUARES = 6302.695313
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 79.780945

PAGE 73 INTERVENTION ANALYSES FOR MH READMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = -0.7387
STANDARD ERROR OF THE MEAN = 0.9475
T-VALUE OF MEAN (AGAINST ZERO) = -0.7796

AUTOCORRELATIONS

1- 8	.05	.04	-.12	-.01	-.07	-.12	-.18	-.10
ST.E	.11	.11	.11	.11	.11	.11	.11	.12
9- 12	-.11	.05	-.08	.09				
ST.E	.12	.12	.12	.12				
13- 20	-.04	.17	-.01	.03	-.05	-.02	-.12	-.11
ST.E	.12	.12	.12	.12	.12	.12	.12	.12
21- 25	.11	.17	-.02	.13	-.02			
ST.E	.13	.13	.13	.13	.13			

PLOT OF SERIAL CORRELATION

```
 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
```

```
LAG CORR
                            I
 1  0.051              +    IX    +
 2  0.035              +    IX    +
 3 -0.118              + XXXI     +
 4 -0.011              +    I     +
 5 -0.073              +  XXI     +
 6 -0.116              + XXXI     +
 7 -0.177             + XXXXI      +
 8 -0.096             +   XXI      +
 9 -0.109             +  XXXI      +
10  0.048             +     IX     +
11 -0.076             +   XXI      +
12  0.092             +     IXX    +
13 -0.040             +    XI      +
14  0.166             +     IXXXX  +
15 -0.014             +     I      +
16  0.026             +     IX     +
17 -0.045             +    XI      +
18 -0.024             +    XI      +
19 -0.122             +  XXXI      +
20 -0.111             +  XXXI      +
21  0.112             +     IXXX   +
22  0.169             +     IXXXX  +
23 -0.024             +    XI      +
24  0.131             +     IXXX   +
25 -0.024             +    XI      +

PAGE  74     INTERVENTION ANALYSES FOR MH READMISSIONS

  END./

NUMBER OF INTEGER WORDS OF STORAGE USED IN
                  PRECEDING  PROBLEM  4708
CPU TIME USED     10.411 SECONDS
PAGE  75     INTERVENTION ANALYSES FOR MH READMISSIONS

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
   JULY 19, 1982  AT 11:40:52

PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED
```

AD First Admissions

```
//L84SAL JOB (3084,028A,,10),'LUEGER',TIME=(0,30),CLASS=6
/*JOBPARM Q=FETCH,I
//STEP1  EXEC  BIMED,PROG=BMDP2T
//FT06F001 DD DSN=&&TEMP1,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD *
/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES - 1ST TIME
                ALCOHOL AND DRUG ADMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'.
/ VARIABLE      NAMES = SHAWNEE, JOHNSON, WYANDOT,SUNFLOW,
                SCENTRL,ECENTRL, COWLEY, AREA, COUNSEL,
                IROQUOIS, HPLAINS,KANZA, SEAST, MHINSTIT,
                FOURCO,BERTNASH, NEAST, SWEST,MIAMI,
                NCENTRL, PRAIRIE, FRANKLIN, LABETTE,
                CRAWFORD,SEDGWICK, CENTRAL, I1, I2, CLOSE,
                GROUP1, GROUP2, GROUP3, TOTAL.
                ADD =  4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS +
                         IROQUOIS + NEAST + SUNFLOW +
                         NCENTRL + SEAST.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY +
                         SCENTRL + ECENTRL + FOURCO + SWEST +
                         COUNSEL + BERTNASH + PRAIRIE +
                         CENTRAL + KANZA + CRAWFORD.
                GROUP3 = SHAWNEE + AREA + MIAMI + FRANKLIN
                         + LABETTE.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT +
                         SUNFLOW + SCENTRL + ECENTRL + COWLEY
                         + AREA + COUNSEL + IROQUOIS +
                         HPLAINS +
                         KANZA + SEAST + MHINSTIT + FOURCO
                         + BERTNASH + NEAST + SWEST + MIAMI +
                         NCENTRL + PRAIRIE + FRANKLIN +
                         LABETTE + CRAWFORD + SEDGWICK +
                         CENTRAL.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
14 2 3 2 1 2 0 0 0 0 0 2 2 0 0 0 1 0 0 4 1 0 0 0 0 3 0 0 0
 9 3 6 0 0 5 0 1 0 0 1 1 1 0 0 0 1 0 0 0 2 0 2 0 1 3 0 0 0
15 2 3 0 2 0 0 3 1 0 2 2 3 1 1 0 3 0 1 0 4 0 0 0 1 6 0 0 0
10 3 3 1 1 4 1 0 0 0 0 1 2 0 2 3 1 0 0 4 0 0 0 0 1 4 0 0 0
14 2 7 1 0 3 0 0 0 0 0 4 2 1 1 0 1 0 1 2 2 0 1 2 0 4 0 0 0
12 2 7 0 1 4 0 0 1 0 0 1 3 1 0 1 1 1 0 1 2 0 0 3 0 3 0 0 0
 3 2 5 0 2 4 0 0 0 0 1 2 2 0 0 1 2 0 2 3 0 1 0 0 1 1 0 0 0
 4 3 3 0 0 2 0 0 0 0 0 1 4 0 1 1 2 0 4 3 1 0 2 0 1 2 0 0 0
```

5	4	3	0	1	2	0	0	0	0	0	3	1	0	2	0	1	0	0	1	1	0	0	1	0	3	0	0	0
9	2	6	0	0	1	0	0	0	0	0	2	1	0	2	1	0	0	0	3	0	1	0	0	0	1	0	0	0
6	4	2	1	0	1	0	0	0	0	0	2	1	0	1	2	1	0	0	2	1	1	0	0	0	0	0	0	0
8	1	6	0	0	1	0	0	0	0	0	0	0	0	1	0	1	0	1	1	3	0	0	0	0	0	0	0	0
20	6	3	1	0	4	0	1	1	0	0	0	1	0	1	0	0	0	1	2	1	0	1	1	3	1	0	0	0
6	4	4	0	1	3	0	1	1	0	0	0	0	0	1	2	2	0	2	5	1	1	0	0	2	1	0	0	0
2	4	8	1	1	2	0	2	1	0	0	0	0	0	1	1	1	0	1	0	4	0	0	0	5	4	0	0	0
8	7	10	0	1	2	0	1	1	0	3	0	0	0	3	1	3	0	2	0	0	1	0	0	7	3	0	0	0
5	6	6	1	0	4	2	2	1	0	0	1	2	3	0	1	2	0	1	2	1	1	1	1	5	1	0	0	0
9	1	7	0	2	0	0	3	2	0	2	2	1	1	2	0	3	0	1	2	2	0	0	0	9	1	0	0	0
14	1	3	1	0	5	0	0	0	0	0	1	2	0	0	1	2	0	2	1	3	0	0	0	0	1	0	0	0
14	5	3	0	1	3	1	1	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	0	0	2	0	0	0
8	4	4	0	0	4	0	0	0	1	0	1	2	0	1	1	3	0	0	1	1	1	1	0	1	2	0	0	0
6	4	3	0	1	0	0	0	0	0	0	1	4	1	0	0	2	0	3	3	0	1	1	0	1	5	0	0	0
6	3	3	1	1	3	0	1	0	0	1	0	4	0	3	0	3	0	1	4	1	1	2	0	0	2	0	0	0
6	4	5	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	3	0	1	0	0	3	2	0	0	0
10	3	8	1	1	0	0	1	0	0	2	0	4	0	0	2	0	1	0	4	2	0	1	1	2	3	0	0	0
5	4	6	1	3	3	0	2	1	0	2	1	3	3	3	1	2	0	0	1	1	0	1	0	1	3	0	0	0
8	5	3	0	0	0	0	2	3	2	3	1	5	0	1	1	2	2	1	2	0	1	0	0	2	5	0	0	0
5	9	11	1	0	1	0	4	1	0	2	0	1	3	2	2	2	1	3	2	2	0	0	0	1	0	0	0	0
7	6	8	0	1	1	0	1	4	1	0	3	1	2	1	0	3	0	1	2	0	0	2	1	1	3	0	0	0
5	8	12	0	3	0	2	0	3	0	3	2	2	2	6	3	2	2	2	0	0	0	5	1	2	4	0	0	0
4	4	5	2	2	3	0	1	0	1	0	4	3	1	2	1	4	0	2	1	2	0	2	2	5	3	0	0	0
10	12	8	0	0	0	0	0	0	0	0	1	1	0	2	2	1	0	2	2	0	0	1	0	3	2	0	0	0
6	5	3	1	0	2	0	2	0	0	0	1	0	1	0	1	1	0	0	5	0	1	0	0	5	3	0	0	0
11	5	6	1	0	1	0	1	0	1	0	0	0	2	0	3	1	0	0	1	0	0	0	0	3	3	0	0	0
3	2	3	0	0	0	0	0	1	0	2	1	0	0	0	2	1	0	0	1	0	0	0	0	3	2	0	0	0
4	1	2	1	0	0	0	2	0	0	1	1	0	0	0	2	1	0	0	2	2	0	0	0	2	2	0	0	0
8	13	11	0	1	2	1	3	2	1	3	0	3	0	1	1	1	0	4	4	0	0	0	4	0	3	0	0	0
11	7	11	0	1	0	0	5	3	0	6	1	1	2	1	1	1	0	0	1	2	0	1	1	1	1	0	0	0
11	7	7	0	0	0	2	2	2	1	1	1	2	0	1	5	2	1	2	3	1	1	1	2	5	0	0	0	0
6	13	14	0	0	1	0	3	1	0	0	0	1	3	1	2	1	0	1	3	2	1	1	0	1	2	0	0	0
8	11	8	0	0	1	0	5	2	0	2	0	4	1	1	0	0	1	0	2	0	1	1	1	5	2	0	0	0
10	4	10	0	0	2	0	4	0	0	0	2	3	1	1	1	3	1	1	2	1	0	2	0	4	0	0	0	0
6	11	8	1	0	2	0	2	1	0	0	1	3	5	1	2	2	0	1	0	1	0	1	0	3	1	0	0	0
7	6	7	0	1	3	3	0	5	0	0	2	4	3	4	0	2	0	1	2	1	1	2	1	5	3	0	0	0
7	12	16	1	2	0	0	4	3	1	1	2	2	4	2	1	3	2	4	1	1	2	1	3	0	2	0	0	0
3	8	16	0	1	2	1	0	2	0	1	1	1	0	2	1	1	0	0	1	3	0	1	1	0	3	0	0	0
9	6	5	0	1	3	1	2	9	0	1	0	7	4	0	0	2	0	1	2	0	0	1	1	1	1	0	0	0
8	11	11	0	0	4	1	3	3	0	0	1	3	1	5	1	3	1	1	2	0	1	0	1	3	7	0	0	0
12	7	7	0	1	1	1	1	2	0	1	0	4	6	3	0	2	0	2	2	0	0	1	1	2	0	0	0	0
4	4	8	0	0	4	1	2	2	0	0	1	2	1	0	2	4	2	2	0	0	2	0	0	7	1	0	0	0
9	3	14	1	0	3	0	1	2	1	3	3	2	0	3	3	1	1	1	0	2	1	3	3	3	2	0	0	0
7	4	13	0	0	0	1	0	4	1	2	0	4	2	1	0	2	0	1	0	0	1	2	0	4	0	0	0	0
6	8	10	0	0	1	0	1	2	0	1	0	2	3	4	3	3	2	1	0	1	0	2	1	7	0	0	0	0
0	4	16	0	0	1	0	2	3	0	2	0	2	5	4	2	0	3	3	0	0	0	1	1	1	0	0	0	0
7	11	10	0	1	2	1	3	3	0	1	1	6	5	2	2	1	0	2	1	3	2	0	1	7	3	0	0	0
10	3	10	1	0	2	1	5	3	0	4	1	1	1	0	3	4	1	0	1	0	0	0	1	5	1	0	0	0
8	8	14	0	0	0	0	4	6	0	4	0	2	1	2	2	3	1	2	2	0	3	0	1	5	2	0	0	0
3	4	11	0	1	2	0	1	1	0	0	2	1	1	1	4	3	2	0	3	0	0	1	0	5	2	0	0	1

```
11 214 0 1 1 1 2 2 0 1 3 0 7 5 1 2 2 0 0 2 1 2 2 3 1 0 0 1
 8 913 0 5 5 0 1 3 1 0 1 0 1 2 2 2 1 0 2 3 0 0 0 4 2 0 0 1
 211 3 0 0 0 0 2 0 0 2 0 1 1 2 1 0 0 1 0 0 0 1 1 4 0 1 0 1
 1 810 0 1 1 0 0 0 0 3 1 3 2 4 0 1 0 0 0 1 0 0 2 1 0 1 0 1
 0 9 9 0 1 4 0 3 1 1 3 2 2 1 4 1 1 0 1 0 0 0 1 2 2 0 1 0 1
 0 5 9 0 0 0 1 1 2 0 3 2 3 3 4 0 2 0 1 0 0 0 2 2 3 0 1 0 1
 0 7 9 0 1 1 1 3 0 0 2 2 3 1 2 1 1 0 1 1 0 1 0 1 3 0 1 0 1
 3 511 0 1 0 1 3 2 0 0 3 1 1 3 1 0 0 2 0 0 0 0 1 0 0 1 0 1
 3 210 0 0 0 0 3 1 1 3 2 3 3 3 0 5 0 2 0 0 0 2 1 2 0 1 0 1
 3 911 0 1 0 0 2 0 0 1 1 2 0 2 0 4 0 1 0 0 1 1 3 1 0 1 0 1
 2 8 9 0 0 0 1 0 3 0 0 0 1 1 2 1 0 0 2 0 0 1 2 1 1 0 1 0 1
 2 6 6 0 1 1 0 0 1 0 0 1 1 2 0 1 1 0 1 2 0 1 0 1 2 0 1 0 1
 1 7 5 0 0 3 2 3 0 0 3 0 1 1 1 1 1 0 4 0 0 0 3 1 1 0 1 0 1
 3 6 6 0 0 1 0 0 1 0 4 1 0 0 3 0 1 0 1 0 0 0 0 1 2 1 1 0 1
 5 511 0 1 2 1 2 2 0 5 1 2 3 6 1 1 0 2 1 0 1 2 4 3 0 1 1 1
 1 8 5 0 0 1 3 4 2 1 2 0 1 1 4 0 0 3 2 2 0 0 0 0 1 0 1 1 1
 3 715 0 1 2 2 4 0 1 5 0 3 2 6 2 0 0 0 1 1 0 1 0 0 0 1 1 1
 2 6 8 0 0 4 0 2 5 0 2 5 3 0 4 1 2 2 1 1 0 0 2 1 2 1 1 1 1
 2 8 8 0 0 5 0 3 2 0 6 2 2 0 1 2 2 0 2 0 0 0 0 1 2 1 1 1 1
 213 7 0 1 1 0 1 2 0 2 1 2 1 2 0 0 3 1 1 1 0 0 1 4 1 1 1 1
 1 2 9 0 0 1 1 2 2 1 2 3 4 2 5 0 3 0 2 0 1 0 1 5 5 0 1 1 1
 2 5 9 0 1 3 1 5 3 0 3 4 1 1 2 2 1 2 1 0 0 0 2 0 0 0 1 1 1
 5 610 0 1 2 0 6 3 0 0 1 2 2 1 1 2 1 0 1 0 0 0 1 4 1 1 1 1
 6 813 0 1 2 0 4 4 0 5 1 1 3 2 0 0 0 0 1 0 0 1 2 1 0 1 1 1
 3 5 9 0 0 1 0 6 3 0 1 1 3 1 3 0 1 0 0 0 0 0 0 0 2 0 1 1 1
 2 810 0 0 1 0 2 0 0 1 1 0 3 1 0 1 1 2 1 0 0 0 0 2 0 1 1 1
/ END
  TPLOT        VARIABLES ARE GROUP1, GROUP2, GROUP3.
               COMMON./
  ACF          VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
  PACF         VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
  ACF          VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./
  PACF         VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./
  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./
  ESTIMATION   RESIDUAL IS RGROUP1.
               TIME=1,63./
  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
```

```
              TIME=1,63./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAORDER IS '(1)'./
INDEP         VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL IS IGROUP1./
ACF           VARIABLE IS IGROUP1.
              MAXLAG IS 25./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAORDER IS '(1)'./
INDEP         VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS CLOSE.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL IS IGROUP1./
ACF           VARIABLE IS IGROUP1.
              MAXLAG IS 25./
ERASE         MODEL./
ACF           VARIABLE IS GROUP2.
              MAXLAG IS 25.
              TIME=1,63./
PACF          VARIABLE IS GROUP2.
              MAXLAG IS 25.
              TIME=1,63./
ACF           VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
PACF          VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
```

```
ARIMA       VARIABLE IS GROUP2.
            DFORDER IS 1.
            MAORDER IS '(1)'./
INDEP       VARIABLE IS I1.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS I2.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
ESTIMATION  RESIDUAL IS IGROUP2./
ACF         VARIABLE IS IGROUP2.
            MAXLAG IS 25./
ERASE       MODEL./
ARIMA       VARIABLE IS GROUP2.
            DFORDER IS 1.
            MAORDER IS '(1)'./
INDEP       VARIABLE IS I1.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS I2.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS CLOSE.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
ESTIMATION  RESIDUAL IS IGROUP2./
ACF         VARIABLE IS IGROUP2.
            MAXLAG IS 25./
ERASE       MODEL./
ACF         VARIABLE IS GROUP3.
            MAXLAG IS 25.
            TIME=1,63./
PACF        VARIABLE IS GROUP3.
            MAXLAG IS 25.
            TIME=1,63./
ARIMA       VARIABLE IS GROUP3.
            CONSTANT./
INDEP       VARIABLE IS I1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS I2.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
ESTIMATION  RESIDUAL IS IGROUP3./
ACF         VARIABLE IS IGROUP3.
```

```
               MAXLAG IS 25./
 ERASE         MODEL./
 ARIMA         VARIABLE IS GROUP3.
               CONSTANT./
 INDEP         VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
 INDEP         VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
 INDEP         VARIABLE IS CLOSE.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
 ESTIMATION    RESIDUAL IS IGROUP3./
 ACF           VARIABLE IS IGROUP3.
               MAXLAG IS 25./
 END/
//STEP2  EXEC SAS,OPTIONS='NOSOURCE'
//IN     DD DSN=&&TEMP1,DISP=(OLD,DELETE)
//OUT    DD DSN=&&TEMP2,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD DSN=L84SAL.SAS.CNTL(FIGURES),DISP=SHR
//STEP3 EXEC IEBGENER
//SYSUT1 DD DSN=&&TEMP2,DISP=(OLD,DELETE)
//SYSUT2 DD DSN=L84SAL.AD1ST,DCB=(RECFM=FB,LRECL=133,
   BLKSIZE=931),
//  DISP=(,CATLG,DELETE),SPACE=(TRK,(2,5),RLSE),UNIT=SYSTS,
//  LABEL=RETPD=120,VOL=SER=LD5010
//SYSIN  DD DUMMY
//
```

```
PAGE    1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY 19, 1982  AT 11:52:44

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT        PAGESIZE=0.
```

```
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES -
                1ST TIME ALCOHOL AND DRUG ADMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'
/ VARIABLE      NAMES = SHAWNEE, JOHNSON, WYANDOT,
                SUNFLOW, SCENTRL, ECENTRL, COWLEY,
                AREA, COUNSEL, IROQUOIS, HPLAINS,
                KANZA, SEAST, MHINSTIT, FOURCO,
                BERTNASH, NEAST, SWEST, MIAMI,
                NCENTRL, PRAIRIE, FRANKLIN, LABETTE,
                CRAWFORD,
                SEDGWICK, CENTRAL, I1, I2, CLOSE,
                GROUP1, GROUP2, GROUP3, TOTAL.
                ADD =  4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS
                         + IROQUOIS + NEAST + SUNFLOW
                         + NCENTRL + SEAST.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY
                         + SCENTRL + ECENTRL + FOURCO
                         + SWEST + COUNSEL +
                         BERTNASH + PRAIRIE + CENTRAL
                         + KANZA + CRAWFORD.
                GROUP3 = SHAWNEE + AREA + MIAMI +
                         FRANKLIN + LABETTE.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT
                         + SUNFLOW + SCENTRL + ECENTRL
                         + COWLEY + AREA + COUNSEL +
                         IROQUOIS + HPLAINS + KANZA +
                         SEAST + MHINSTIT +  FOURCO
                         + BERTNASH + NEAST + SWEST +
                         MIAMI + NCENTRL + PRAIRIE +
                         FRANKLIN + LABETTE +
                         CRAWFORD + SEDGWICK + CENTRAL.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
PROBLEM TITLE IS
INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

NUMBER OF VARIABLES TO READ IN                         29
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS            4
TOTAL NUMBER OF VARIABLES                              33
NUMBER OF CASES TO READ IN                         TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS      NEITHER
BLANKS ARE                                        MISSING
INPUT UNIT NUMBER                                       5
REWIND INPUT UNIT PRIOR TO READING    DATA             NO
NUMBER OF WORDS OF DYNAMIC STORAGE                  45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT               1
```

```
***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 SHAWNEE      2 JOHNSON      3 WYANDOT
     4 SUNFLOW      5 SCENTRL      6 ECENTRL
     7 COWLEY       8 AREA         9 COUNSEL
    10 IROQUOIS    11 HPLAINS     12 KANZA
    13 SEAST       14 MHINSTIT    15 FOURCO
    16 BERTNASH    17 NEAST       18 SWEST
    19 MIAMI       20 NCENTRL     21 PRAIRIE
    22 FRANKLIN    23 LABETTE     24 CRAWFORD
    25 SEDGWICK    26 CENTRAL     27 I1
    28 I2          29 CLOSE       30 GROUP1
    31 GROUP2      32 GROUP3      33 TOTAL
INPUT FORMAT IS
(29F2.0)
MAXIMUM LENGTH DATA RECORD IS    58 CHARACTERS
```

I N P U T   V A R I A B L E S

VARIABLE INDEX	NAME	RECORD NO	COLUMNS BEGIN	END	FIELD WIDTH	TYPE
1	SHAWNEE	1	1	2	2	F
2	JOHNSON	1	3	4	2	F
3	WYANDOT	1	5	6	2	F
4	SUNFLOW	1	7	8	2	F
5	SCENTRL	1	9	10	2	F
6	ECENTRL	1	11	12	2	F
7	COWLEY	1	13	14	2	F
8	AREA	1	15	16	2	F
9	COUNSEL	1	17	18	2	F
10	IROQUOIS	1	19	20	2	F
11	HPLAINS	1	21	22	2	F
12	KANZA	1	23	24	2	F
13	SEAST	1	25	26	2	F
14	MHINSTIT	1	27	28	2	F
15	FOURCO	1	29	30	2	F
16	BERTNASH	1	31	32	2	F
17	NEAST	1	33	34	2	F
18	SWEST	1	35	36	2	F
19	MIAMI	1	37	38	2	F
20	NCENTRL	1	39	40	2	F
21	PRAIRIE	1	41	42	2	F
22	FRANKLIN	1	43	44	2	F
23	LABETTE	1	45	46	2	F
24	CRAWFORD	1	47	48	2	F
25	SEDGWICK	1	49	50	2	F
26	CENTRAL	1	51	52	2	F
27	I1	1	53	54	2	F
28	I2	1	55	56	2	F
29	CLOSE	1	57	58	2	F

```
BMDP FILE IS BEING WRITTEN ON UNIT       3
CODE.      IS     TEMP
CONTENT    IS     DATA
LABEL      IS
     JULY 19, 1982        11:52:44
VARIABLES ARE
     1 SHAWNEE       2 JOHNSON       3 WYANDOT
     4 SUNFLOW       5 SCENTRL       6 ECENTRL
     7 COWLEY        8 AREA          9 COUNSEL
    10 IROQUOIS     11 HPLAINS      12 KANZA
    13 SEAST        14 MHINSTIT     15 FOURCO
    16 BERTNASH     17 NEAST        18 SWEST
    19 MIAMI        20 NCENTRL      21 PRAIRIE
    22 FRANKLIN     23 LABETTE      24 CRAWFORD
```

```
   25 SEDGWICK    26 CENTRAL     27 I1
   28 I2          29 CLOSE       30 GROUP1
   31 GROUP2      32 GROUP3      33 TOTAL
BASED ON INPUT FORMAT SUPPLIED
1 RECORDS READ PER CASE

NUMBER OF CASES READ           84

BMDP   FILE ON UNIT  3 HAS BEEN COMPLETED
----------------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE   2      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS


  TPLOT        VARIABLES ARE GROUP1, GROUP2, GROUP3.
               COMMON./

SYMBOL FOR VARIABLE GROUP1    IS    A
SYMBOL FOR VARIABLE GROUP2    IS    B
SYMBOL FOR VARIABLE GROUP3    IS    C

        5.00      15.0      25.0      35.0      45.0
   0.00      10.0      20.0      30.0      40.0
   .+----+----+----+----+----+----+----+----+----+----+-
    I          AB C
    I       A    C    B
    I           A       CB
    I          C A      B
  5 +        A       C       B
    I       A    C            B
    I      C    A   B
    I          CB A
    I     C A        B
 10 +      A    C  B
    I       C *
    I  A      C B
    I            BA          C
    I          C  AB
 15 +     C     A          B
    I            C      AB
    I          C      A  B
    I             C     AB
    I       A      B C
 20 +      A     B  C
    I          C A B
    I           *  A
    I           C B  A
    I        CB A
 25 +            C   A B
```

```
   I        C     A          B
   I            C   B    A
   I            C     A    B
   I           C  A         B
30 +            C    A                      B
   I         C          A    B
   I             C B   A
   I         C B     A
   I            *  B
35 +   C     *
   I      C AB
   I               C         AB
   I                 *      B
   I                 C   AB
40 +            C      A      B
   I               C B      A
   I                AC B
   I          C         A B
   I           C       A             B
45 +                  C  A                B
   I    C       A                    B
   I             C     A     B
   I             C        A             B
   I                C A   B
50 +          C      A    B
   I              AC                    B
   I           C     A   B
   I          C          A     B
   I      C  A                         B
55 +              C            A      B
   I               C   A    B
   I                 C      A    B
   I     C          A          B
   I        A       C                         B
60 +         C        A                   B
   I      C B         A
   I C              A     B
   I     C            A      B
   I    C           A      B
65 +     C           A B
   I      A C               B
   I          C     A   B
   I        C        AB
   I       C  A       B
70 +    C       A B
   I           C AB
   I    C        AB
   I            C    A              B
   I       C       A   B
75 +        C        A             B
```

```
    I       C        A              B
    I       C            A B
    I    C                BA
    I      C          A            B
 80 +          *                  B
    I           C   A        B
    I           C    A            B
    I         C  A     B
    I      C      A   B
```

PAGE 3 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ACF          VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
```

```
NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         14.9841
STANDARD ERROR OF THE MEAN         =          0.6771
T-VALUE OF MEAN (AGAINST ZERO)     =         22.1285
```

AUTOCORRELATIONS

```
  1-  8      .39  .34  .21  .24  .28  .19  .22  .28
  ST.E       .13  .14  .16  .16  .17  .17  .18  .18

  9- 12      .20 ..32  .14  .16
  ST.E       .19  .19  .20  .20

 13- 20      .10  .21  .13  .20  .02  .04 -.07 -.05
  ST.E       .20  .20  .21  .21  .21  .21  .21  .21

 21- 25     -.11 -.10  .05  .05 -.04
  ST.E       .21  .21  .21  .21  .21
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.390           +        IXXXXX+XXXX
 2  0.336          +         IXXXXXX+X
 3  0.213         +          IXXXXX  +
 4  0.245         +          IXXXXXX +
 5  0.285         +          IXXXXXXX+
 6  0.186        +           IXXXXX   +
```

```
 7  0.216          +        IXXXXX   +
 8  0.283          +        IXXXXXXX +
 9  0.196          +        IXXXXX   +
10  0.320          +        IXXXXXXXX+
11  0.137         +         IXXX       +
12  0.163         +         IXXXX      +
13  0.098         +         IXX        +
14  0.208         +         IXXXXX     +
15  0.133         +         IXXX       +
16  0.195         +         IXXXXX     +
17  0.018         +         I          +
18  0.043         +         IX         +
19 -0.071         +       XXI          +
20 -0.051         +        XI          +
21 -0.109         +      XXXI          +
22 -0.100         +       XXI          +
23  0.049         +         IX         +
24  0.054         +         IX         +
25 -0.035         +        XI          +
```

PAGE 4 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  PACF         VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	63
MEAN OF THE (DIFFERENCED) SERIES	=	14.9841
STANDARD ERROR OF THE MEAN	=	0.6771
T-VALUE OF MEAN (AGAINST ZERO)	=	22.1285

PARTIAL AUTOCORRELATIONS

```
  1-  8      .39  .22  .03  .12  .16 -.02  .07  .18
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 13- 20     -.04  .13 -.09  .11 -.19 -.07 -.15 -.08
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.03  .18 -.09 -.02
  ST.E       .13  .13  .13  .13

 21- 25     -.12 -.06  .19 -.02 -.01
  ST.E       .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
  1  0.390             +     IXXXXX+XXXX
  2  0.217             +     IXXXXX+
  3  0.032             +     IX    +
  4  0.122             +     IXXX  +
  5  0.161             +     IXXXX +
  6 -0.023             +    XI     +
  7  0.073             +     IXX   +
  8  0.176             +     IXXXX +
  9 -0.035             +    XI     +
 10  0.180             +     IXXXXX+
 11 -0.088             +   XXI     +
 12 -0.024             +    XI     +
 13 -0.040             +    XI     +
 14  0.134             +     IXXX  +
 15 -0.086             +   XXI     +
 16  0.111             +     IXXX  +
 17 -0.187             +XXXXXI     +
 18 -0.073             +   XXI     +
 19 -0.149             + XXXXI     +
 20 -0.081             +   XXI     +
 21 -0.123             +  XXXI     +
 22 -0.055             +    XI     +
 23  0.192             +     IXXXXX+
 24 -0.016             +     I     +
 25 -0.008             +     I     +

PAGE   5     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ACF          VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS              =          62
MEAN OF THE (DIFFERENCED) SERIES =         0.1129
STANDARD ERROR OF THE MEAN          =      0.7554
T-VALUE OF MEAN (AGAINST ZERO)      =      0.1495

AUTOCORRELATIONS

  1-  8      -.47  .06 -.13  0.0  .10 -.11 -.02  .11
  ST.E        .13  .15  .15  .15  .15  .16  .16  .16

  9- 12      -.15  .24 -.18  .10
  ST.E        .16  .16  .17  .17
```

```
13- 20    -.15  .15 -.10  .20 -.16  .08 -.11  .07
 ST.E      .17  .17  .17  .18  .18  .18  .18  .18

21- 25    -.05 -.12  .12  .08 -.05
 ST.E      .18  .18  .18  .19  .19
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.466         XXXXXX+XXXXXI    +
 2  0.061              +     IXX    +
 3 -0.126              +  XXXI      +
 4 -0.001             +      I       +
 5  0.102             +      IXXX    +
 6 -0.112             +   XXXI       +
 7 -0.020             +      I       +
 8  0.105             +      IXXX    +
 9 -0.153             +  XXXXI       +
10  0.244             +      IXXXXXX +
11 -0.181             + XXXXXI       +
12  0.099             +      IXX     +
13 -0.149             +  XXXXI       +
14  0.147             +      IXXXX   +
15 -0.103            +    XXXI        +
16  0.199            +       IXXXXX   +
17 -0.157            +   XXXXI        +
18  0.081            +       IXX      +
19 -0.110            +    XXXI        +
20  0.073            +       IXX      +
21 -0.046            +      XI        +
22 -0.124            +    XXXI        +
23  0.116            +       IXXX     +
24  0.085            +       IXX      +
25 -0.047            +      XI        +
```

PAGE 6 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  PACF        VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./

NUMBER OF OBSERVATIONS          =          62
MEAN OF THE (DIFFERENCED) SERIES =      0.1129
STANDARD ERROR OF THE MEAN      =      0.7554
```

```
T-VALUE OF MEAN (AGAINST ZERO)   =          0.1495


PARTIAL AUTOCORRELATIONS

  1-  8     -.47 -.20 -.25 -.24 -.06 -.16 -.25 -.07
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.27 -.01 -.09 -.04
  ST.E       .13  .13  .13  .13

 13- 20     -.21 -.03 -.19  .13  .06  .13  .06  .11
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25      .07 -.21 -.05 -.04  .02
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.466        XXXXXX+XXXXXI    +
 2 -0.199              +XXXXXI    +
 3 -0.246              XXXXXXI    +
 4 -0.243              XXXXXXI    +
 5 -0.061              +   XXI    +
 6 -0.162              + XXXXI    +
 7 -0.245              XXXXXXI    +
 8 -0.069              +   XXI    +
 9 -0.267             X+XXXXXI    +
10 -0.008              +     I    +
11 -0.089              +   XXI    +
12 -0.045              +    XI    +
13 -0.212              +XXXXXI    +
14 -0.029              +    XI    +
15 -0.194              +XXXXXI    +
16  0.134              +     IXXX +
17  0.056              +     IX   +
18  0.127              +     IXXX +
19  0.061              +     IXX  +
20  0.108              +     IXXX +
21  0.075              +     IXX  +
22 -0.207              +XXXXXI    +
23 -0.050              +    XI    +
24 -0.036              +    XI    +
25  0.020              +     IX   +
```

PAGE 7 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./
```

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT VARIABLE = NOISE

PAGE 8 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ESTIMATION  RESIDUAL IS RGROUP1.
              TIME=1,63./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP1	MA	1	1	0.8413	0.0675	12.46

RESIDUAL SUM OF SQUARES = 1362.850342
DEGREES OF FREEDOM = 61
RESIDUAL MEAN SQUARE = 22.341797

PAGE 9 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

```
SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR TYPE  MEAN      TIME      DIFFERENCES
                                                  1
GROUP1     RANDOM               1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1      1     0.8389

                                   ST  ERR   T-RATIO
                                    0.0660    12.71

RESIDUAL SUM OF SQUARES  =        1357.978027
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                  61
RESIDUAL MEAN SQUARE     =          22.261932

PAGE  10      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS                =           63
MEAN OF THE (DIFFERENCED) SERIES =           0.7195
STANDARD ERROR OF THE MEAN        =           0.5828
T-VALUE OF MEAN (AGAINST ZERO)    =           1.2346


AUTOCORRELATIONS

  1-  8      .05  0.0 -.17 -.10 -.02 -.15 -.07  .05
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 13- 20     -.05  .14  .06  .17 -.10 -.06 -.18 -.09
  ST.E       .14  .14  .14  .14  .15  .15  .15  .15

  9- 12     -.03  .19 -.06  .04
  ST.E       .13  .13  .14  .14

 21- 25     -.15 -.12  .14  .18  .06
  ST.E       .15  .15  .16  .16  .16


PLOT OF SERIAL CORRELATION
```

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.046               +     IX    +
 2 -0.002               +     I     +
 3 -0.169               + XXXXI     +
 4 -0.097               +   XXI     +
 5 -0.024               +    XI     +
 6 -0.151               + XXXXI     +
 7 -0.066              +    XXI      +
 8  0.054              +      IX     +
 9 -0.026              +     XI      +
10  0.193              +      IXXXXX +
11 -0.059              +     XI      +
12  0.042              +      IX     +
13 -0.051              +     XI      +
14  0.144              +      IXXXX  +
15  0.058              +      IX     +
16  0.171              +      IXXXX  +
17 -0.096              +    XXI      +
18 -0.060              +    XXI      +
19 -0.180              + XXXXXI      +
20 -0.092              +    XXI      +
21 -0.150              +  XXXXI      +
22 -0.124             +    XXXI       +
23  0.137             +       IXXX    +
24  0.180             +       IXXXXX  +
25  0.063             +       IXX     +

PAGE  11     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  12     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  13     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS
```

```
  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  14     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  15     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP1     RANDOM             1-  84  (1-B  )
                                              1
I1         BINARY             1-  84  (1-B  )
                                              1
I2         BINARY             1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       MA      1       1     0.8439
      2  I1           UP      1       0    -2.0389
```

3	I2	UP	1	0	2.5810

ST ERR	T-RATIO
0.0612	13.80
2.4630	-0.83
2.5065	1.03

RESIDUAL SUM OF SQUARES = 1644.706543
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 20.558823

PAGE 16 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MA	1	1	0.8417
2	I1	UP	1	0	-2.0299
3	I2	UP	1	0	2.5952

ST ERR	T-RATIO
0.0597	14.09
2.4596	-0.83
2.5014	1.04

RESIDUAL SUM OF SQUARES = 1639.937500
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 20.499207

PAGE 17 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ACF          VARIABLE IS IGROUP1.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS             =            84
MEAN OF THE (DIFFERENCED) SERIES =          0.3429
STANDARD ERROR OF THE MEAN         =        0.4837
T-VALUE OF MEAN (AGAINST ZERO)     =        0.7089


AUTOCORRELATIONS

  1- 8       .07 -.03 -.12 -.05 -.02 -.12  .01  .06
  ST.E       .11  .11  .11  .11  .11  .11  .11  .11

  9- 12     -.08  .23 -.07  .08
  ST.E       .11  .11  .12  .12

 13- 20     -.03  .16  .13  .15 -.05 -.04 -.20  .01
  ST.E       .12  .12  .12  .12  .13  .13  .13  .13

 21- 25     -.07 -.05  .12  .19  .01
  ST.E       .13  .13  .13  .13  .14


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.069                +    IXX  +
 2 -0.028                +   XI    +
 3 -0.120                + XXXI    +
 4 -0.053                +   XI    +
 5 -0.018                +    I    +
 6 -0.116                + XXXI    +
 7  0.010               +     I     +
 8  0.063               +     IXX   +
 9 -0.082               +   XXI     +
10  0.233               +     IXXXXXX
11 -0.070               +   XXI     +
12  0.079               +     IXX   +
13 -0.033               +    XI     +
14  0.162               +     IXXXX +
15  0.126               +     IXXX  +
16  0.150               +     IXXXX +
17 -0.052               +    XI     +
18 -0.045               +    XI     +
19 -0.204               +XXXXXI     +
20  0.014               +     I     +
```

```
21 -0.075              +   XXI      +
22 -0.048              +    XI      +
23  0.123              +     IXXX   +
24  0.188             +      IXXXXX +
25  0.010             +      I       +

PAGE  18      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  19      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  20      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  21      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
```

```
PAGE  22      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE     I1        I2        CLOSE
PAGE  23      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                           1
GROUP1     RANDOM             1-   84   (1-B  )
                                           1
I1         BINARY             1-   84   (1-B  )
                                           1
I2         BINARY             1-   84   (1-B  )
                                           1
CLOSE      BINARY             1-   84   (1-B  )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1      0.8343
      2  I1            UP      1       0      1.1685
      3  I2            UP      1       0      2.6733
      4  CLOSE         UP      1       0     -5.3138

                                  ST  ERR    T-RATIO
                                   0.0648      12.88
                                   3.0475       0.38
                                   2.5308       1.06
```

```
                                  3.0836      -1.72

RESIDUAL SUM OF SQUARES   =      1583.736572
DEGREES OF FREEDOM        =               79
RESIDUAL MEAN SQUARE      =        20.047287

PAGE  24     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM             1-  84   (1-B  )
                                                1
I1         BINARY             1-  84   (1-B  )
                                                1
I2         BINARY             1-  84   (1-B  )
                                                1
CLOSE      BINARY             1-  84   (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       MA      1       1     0.8327
      2  I1           UP      1       0     1.1710
      3  I2           UP      1       0     2.6849
      4  CLOSE        UP      1       0    -5.3278

                                 ST  ERR   T-RATIO
                                  0.0638     13.05
                                  3.0442      0.38
                                  2.5279      1.06
                                  3.0786     -1.73

RESIDUAL SUM OF SQUARES   =      1578.653320
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =               79
RESIDUAL MEAN SQUARE      =        19.982941

PAGE  25     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS
```

```
ACF          VARIABLE IS IGROUP1.
             MAXLAG IS 25.

NUMBER OF OBSERVATIONS              =           84
MEAN OF THE (DIFFERENCED) SERIES =          0.4682
STANDARD ERROR OF THE MEAN          =       0.4732
T-VALUE OF MEAN (AGAINST ZERO)      =       0.9894


AUTOCORRELATIONS

  1-  8      .04 -.01 -.07 -.06 -.01 -.17 -.03  .01
  ST.E       .11  .11  .11  .11  .11  .11  .11  .11

  9- 12     -.11  .23 -.10  .05
  ST.E       .11  .11  .12  .12

 13- 20     -.06  .15  .14  .15 -.03 -.01 -.15  .03
  ST.E       .12  .12  .12  .13  .13  .13  .13  .13

 21- 25     -.06 -.08  .09  .12 -.05
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.041               +    IX   +
 2 -0.006               +    I    +
 3 -0.070               +  XXI    +
 4 -0.058               +   XI    +
 5 -0.008               +    I    +
 6 -0.168               +XXXXI    +
 7 -0.028              +    XI     +
 8  0.013              +     I     +
 9 -0.113              +  XXXI     +
10  0.232              +     IXXXXXX
11 -0.096              +   XXI     +
12  0.050              +     IX    +
13 -0.057              +    XI     +
14  0.150              +     IXXXX +
15  0.139              +     IXXX  +
16  0.146              +     IXXXX +
17 -0.029              +    XI     +
18 -0.010              +     I     +
19 -0.155              + XXXXI     +
20  0.029              +     IX    +
```

```
21 -0.059              +     XI      +
22 -0.076              +    XXI      +
23  0.091              +      IXX    +
24  0.120              +      IXXX   +
25 -0.045             +      XI       +

PAGE  26     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  27     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ACF          VARIABLE IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =        21.2222
STANDARD ERROR OF THE MEAN        =         1.0931
T-VALUE OF MEAN (AGAINST ZERO)    =        19.4153


AUTOCORRELATIONS

  1- 8       .54  .30  .33  .22  .18  .17  .16  .23
  ST.E       .13  .16  .17  .18  .18  .18  .19  .19

  9- 12      .27  .15  .25  .20
  ST.E       .19  .20  .20  .21

 13- 20      .14  .28  .19  .04 -.02 -.06 -.07 -.01
  ST.E       .21  .21  .22  .22  .22  .22  .22  .22

 21- 25     -.04 -.05 -.06 -.11  0.0
  ST.E       .22  .22  .22  .22  .22


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                 I
 1  0.536               +        IXXXXX+XXXXXXX
 2  0.305             +          IXXXXXXXX
 3  0.330             +          IXXXXXXXX
 4  0.220            +           IXXXXXX  +
```

```
 5  0.178         +        IXXXX    +
 6  0.168         +        IXXXX    +
 7  0.165         +        IXXXX    +
 8  0.231         +        IXXXXXX  +
 9  0.269         +        IXXXXXXX +
10  0.149        +         IXXXX     +
11  0.253        +         IXXXXXX   +
12  0.202        +         IXXXXX    +
13  0.145        +         IXXXX     +
14  0.282        +         IXXXXXXX  +
15  0.188       +          IXXXXX     +
16  0.043       +          IX         +
17 -0.020       +         XI          +
18 -0.058       +         XI          +
19 -0.072       +        XXI          +
20 -0.014       +          I          +
21 -0.040       +         XI          +
22 -0.046       +         XI          +
23 -0.058       +         XI          +
24 -0.111       +       XXXI          +
25 -0.003       +          I          +
```

PAGE 28 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
 PACF        VARIABLE IS GROUP2.
             MAXLAG IS 25.
             TIME=1,63./
```

```
NUMBER OF OBSERVATIONS             =          63
MEAN OF THE (DIFFERENCED) SERIES =       21.2222
STANDARD ERROR OF THE MEAN         =      1.0931
T-VALUE OF MEAN (AGAINST ZERO)     =     19.4153
```

PARTIAL AUTOCORRELATIONS

```
 1-  8     .54  .02  .22 -.06  .07  .01  .07  .13
 ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 9- 12     .10 -.11  .22 -.12
 ST.E      .13  .13  .13  .13

13- 20     .10  .16 -.10 -.12 -.16 -.07 -.03  .02
 ST.E      .13  .13  .13  .13  .13  .13  .13  .13

21- 25    -.02 -.10 -.14  0.0  .12
 ST.E      .13  .13  .13  .13  .13
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.536              +     IXXXXX+XXXXXXX
 2  0.025              +     IX    +
 3  0.221              +     IXXXXXX
 4 -0.061              +   XXI     +
 5  0.072              +     IXX   +
 6  0.006              +     I     +
 7  0.070              +     IXX   +
 8  0.132              +     IXXX  +
 9  0.102              +     IXXX  +
10 -0.106              +  XXXI     +
11  0.219              +     IXXXXX+
12 -0.124              +  XXXI     +
13  0.096              +     IXX   +
14  0.157              +     IXXXX +
15 -0.102              +  XXXI     +
16 -0.122              +  XXXI     +
17 -0.163              + XXXXI     +
18 -0.068              +   XXI     +
19 -0.026              +    XI     +
20  0.016              +     I     +
21 -0.019              +     I     +
22 -0.096              +   XXI     +
23 -0.143              + XXXXI     +
24  0.004              +     I     +
25  0.120              +     IXXX  +

PAGE  29     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ACF          VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS             =           62
MEAN OF THE (DIFFERENCED) SERIES =         0.2097
STANDARD ERROR OF THE MEAN         =       1.0576
T-VALUE OF MEAN (AGAINST ZERO)     =       0.1983


AUTOCORRELATIONS

  1-  8      -.24 -.26  .12 -.07 -.02 -.03 -.08  .03
  ST.E        .13  .13  .14  .14  .14  .14  .14  .15
```

```
 9- 12      .16 -.25  .18  0.0
 ST.E       .15  .15  .16  .16

13- 20     -.20  .27  .04 -.08 -.04 -.04 -.08  .11
 ST.E       .16  .16  .17  .17  .17  .17  .17  .17

21- 25     -.03  .01  .03 -.15  .23
 ST.E       .17  .17  .17  .17  .17


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.244                XXXXXXI     +
 2 -0.263               XXXXXXXI      +
 3  0.119               +      IXXX   +
 4 -0.068               +    XXI      +
 5 -0.021               +     XI      +
 6 -0.032               +     XI      +
 7 -0.081               +    XXI      +
 8  0.033               +      IX     +
 9  0.165               +      IXXXX  +
10 -0.250               +XXXXXXI      +
11  0.180              +       IXXXX   +
12 -0.005              +       I       +
13 -0.199              +  XXXXXI       +
14  0.273              +       IXXXXXXX+
15  0.039              +       IX      +
16 -0.080              +     XXI       +
17 -0.041              +      XI       +
18 -0.043              +      XI       +
19 -0.082              +     XXI       +
20  0.107              +       IXXX    +
21 -0.026              +      XI       +
22  0.013              +       I       +
23  0.026              +       IX      +
24 -0.154              +   XXXXI       +
25  0.230             +        IXXXXXX  +

PAGE  30     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  PACF         VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./
```

```
NUMBER OF OBSERVATIONS                 =            62
MEAN OF THE (DIFFERENCED) SERIES =          0.2097
STANDARD ERROR OF THE MEAN         =          1.0576
T-VALUE OF MEAN (AGAINST ZERO)    =          0.1983


PARTIAL AUTOCORRELATIONS

  1- 8     -.24 -.34 -.06 -.17 -.08 -.15 -.20 -.17
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     .04 -.30  .06 -.18
  ST.E      .13  .13  .13  .13

 13- 20    -.24  .05  .06  .10  0.0 -.06 -.11 -.05
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     .04  .08 -.11 -.17  .07
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.244              XXXXXXI     +
 2 -0.343           XXX+XXXXXI     +
 3 -0.061              +   XXI     +
 4 -0.166              + XXXXI     +
 5 -0.082              +   XXI     +
 6 -0.153              + XXXXI     +
 7 -0.203              +XXXXXI     +
 8 -0.166              + XXXXI     +
 9  0.038              +     IX    +
10 -0.298             X+XXXXXI     +
11  0.058              +     IX    +
12 -0.179              + XXXXI     +
13 -0.238              XXXXXXI     +
14  0.046              +     IX    +
15  0.058              +     IX    +
16  0.098              +     IXX   +
17 -0.005              +     I     +
18 -0.055              +    XI     +
19 -0.114              +  XXXI     +
20 -0.053              +    XI     +
21  0.036              +     IX    +
22  0.081              +     IXX   +
23 -0.109              +  XXXI     +
```

```
24 -0.169            + XXXXI     +
25  0.066            +     IXX   +

PAGE  31     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  32     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ESTIMATION  RESIDUAL IS RGROUP2.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP2     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.6053

                                    ST  ERR   T-RATIO
                                     0.1058      5.72

RESIDUAL SUM OF SQUARES  =      3600.301025
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =        59.021317

PAGE  33     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD
```

MAXIMUM NO OF ITERATION 10 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	MA	1	1	0.7564	0.0858	8.81

RESIDUAL SUM OF SQUARES = 3524.844727
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 61
RESIDUAL MEAN SQUARE = 57.784332

PAGE 34 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ACF VARIABLE IS RGROUP2.
MAXLAG IS 25.
TIME=1,63./

NUMBER OF OBSERVATIONS = 63
MEAN OF THE (DIFFERENCED) SERIES = 0.5723
STANDARD ERROR OF THE MEAN = 0.9503
T-VALUE OF MEAN (AGAINST ZERO) = 0.6023

AUTOCORRELATIONS

1- 8	.24	-.10	-.04	-.16	-.17	-.16	-.14	-.01
ST.E	.13	.13	.13	.13	.14	.14	.14	.15
9- 12	.08	-.09	.11	.04				
ST.E	.15	.15	.15	.15				
13- 20	-.01	.25	.12	-.07	-.14	-.15	-.12	.02
ST.E	.15	.15	.16	.16	.16	.16	.16	.16
21- 25	-.01	0.0	-.01	-.07	.13			
ST.E	.16	.16	.16	16	.16			

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.241                +    IXXXXXX
 2 -0.104               +   XXXI      +
 3 -0.039               +     XI      +
 4 -0.157               +  XXXXI      +
 5 -0.168               +  XXXXI      +
 6 -0.164               +  XXXXI      +
 7 -0.141               +  XXXXI      +
 8 -0.011               +     I       +
 9  0.079               +     IXX     +
10 -0.093               +    XXI      +
11  0.113               +     IXXX    +
12  0.044               +     IX      +
13 -0.008               +     I       +
14  0.254               +     IXXXXXX+
15  0.118              +      IXXX     +
16 -0.067              +     XXI       +
17 -0.137              +    XXXI       +
18 -0.154              +   XXXXI       +
19 -0.124              +    XXXI       +
20  0.019              +      I        +
21 -0.007              +      I        +
22  0.001              +      I        +
23 -0.009              +      I        +
24 -0.066              +     XXI       +
25  0.133              +      IXXX     +

PAGE  35     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  36     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
```

```
PAGE  37      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  38      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2
PAGE  39      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP2     RANDOM             1-  84  (1-B  )
                                                1
I1         BINARY             1-  84  (1-B  )
                                                1
I2         BINARY             1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
```

1	GROUP2	MA	1	1	0.4941
2	I1	UP	1	0	-21.3876
3	I2	UP	1	0	13.5008

ST ERR	T-RATIO
0.1007	4.91
5.8897	-3.63
5.8240	2.32

```
RESIDUAL SUM OF SQUARES  =     3534.644287
DEGREES OF FREEDOM       =              80
RESIDUAL MEAN SQUARE     =       44.183044
```

PAGE 40 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^1)$
I1	BINARY		1- 84	$(1-B^1)$
I2	BINARY		1- 84	$(1-B^1)$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.5419
2	I1	UP	1	0	-20.1624
3	I2	UP	1	0	13.0391

ST ERR	T-RATIO
0.0962	5.63
5.6662	-3.56
5.5922	2.33

```
RESIDUAL SUM OF SQUARES  =     3504.417725
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =              80
RESIDUAL MEAN SQUARE     =       43.805222
```

```
PAGE  41      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS            =          84
MEAN OF THE (DIFFERENCED) SERIES  =      0.3014
STANDARD ERROR OF THE MEAN        =      0.7095
T-VALUE OF MEAN (AGAINST ZERO)    =      0.4248


AUTOCORRELATIONS

  1- 8      .10 -.15  .04 -.09 -.22 -.11 -.03 -.02
  ST.E      .11  .11  .11  .11  .11  .12  .12  .12

  9- 12     .11 -.10  .06 -.06
  ST.E      .12  .12  .12  .12

 13- 20     .01  .20  .06  .04 -.03 -.05 -.13  0.0
  ST.E      .12  .12  .13  .13  .13  .13  .13  .13

 21- 25     0.0  .07 -.04 -.03  .22
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.102               +    IXXX +
 2 -0.151               +XXXXI    +
 3  0.040              +     IX    +
 4 -0.088              +   XXI     +
 5 -0.221              XXXXXXI     +
 6 -0.114              +  XXXI     +
 7 -0.028              +    XI     +
 8 -0.016              +     I     +
 9  0.110              +     IXXX  +
10 -0.101              +  XXXI     +
11  0.061              +     IXX   +
12 -0.063              +   XXI     +
13  0.008              +     I     +
14  0.202              +     IXXXXX+
15  0.058              +     IX    +
16  0.043              +     IX    +
17 -0.033              +    XI     +
```

```
18 -0.050              +    XI     +
19 -0.126              +  XXXI     +
20  0.004              +     I     +
21  0.004              +     I     +
22  0.073              +     IXX   +
23 -0.042              +    XI     +
24 -0.033              +    XI     +
25  0.219              +     IXXXXX+

PAGE  42     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  43     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ARIMA       VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  44     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP       VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  45     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP       VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL
```

```
THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2
PAGE  46     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  INDEP       VARIABLE IS CLOSE.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  47     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP2     RANDOM              1-  84  (1-B  )
                                              1
I1         BINARY              1-  84  (1-B  )
                                              1
I2         BINARY              1-  84  (1-B  )
                                              1
CLOSE      BINARY              1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.5264
      2  I1           UP      1       0   -21.3917
      3  I2           UP      1       0    13.2355
      4  CLOSE        UP      1       0     4.8715

                                  ST  ERR   T-RATIO
                                   0.0993      5.30
                                   5.8064     -3.68
```

5.7310	2.31
5.7717	0.84

RESIDUAL SUM OF SQUARES = 3500.974121
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 44.316116

PAGE 48 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

MAXIMUM NO OF ITERATION 10 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.6172
2	I1	UP	1	0	-19.6814
3	I2	UP	1	0	12.2585
4	CLOSE	UP	1	0	5.6104

ST ERR	T-RATIO
0.0905	6.82
5.4030	-3.64
5.2586	2.33
5.3742	1.04

RESIDUAL SUM OF SQUARES = 3457.906494
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 43.770966

PAGE 49 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ACF         VARIABLE IS IGROUP2.
              MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =              84
MEAN OF THE (DIFFERENCED) SERIES =             0.2030
STANDARD ERROR OF THE MEAN          =          0.7057
T-VALUE OF MEAN (AGAINST ZERO)      =          0.2876


AUTOCORRELATIONS

  1- 8      .13 -.11  .04 -.14 -.26 -.12 -.05 -.02
  ST.E      .11  .11  .11  .11  .11  .12  .12  .12

  9- 12     .13 -.08  .08 -.03
  ST.E      .12  .12  .13  .13

 13- 20     .01  .18  .05  .05 -.04 -.06 -.11 -.01
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.03  .07 -.02 -.01  .25
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.131               +    IXXX +
 2 -0.110               + XXXI    +
 3  0.036               +    IX   +
 4 -0.139              +  XXXI     +
 5 -0.257              XXXXXXI     +
 6 -0.123              +  XXXI     +
 7 -0.051              +    XI     +
 8 -0.022              +    XI     +
 9  0.129              +     IXXX  +
10 -0.079              +   XXI     +
11  0.083              +     IXX   +
12 -0.032              +    XI     +
13  0.014              +     I     +
14  0.184              +     IXXXXX+
15  0.053              +     IX    +
16  0.053              +     IX    +
17 -0.036              +    XI     +
18 -0.057              +    XI     +
19 -0.115              +  XXXI     +
```

```
20 -0.007              +     I     +
21 -0.032              +    XI     +
22  0.068              +     IXX   +
23 -0.016              +     I     +
24 -0.014              +     I     +
25  0.248              +     IXXXXXX
```

PAGE 50 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ERASE        MODEL./
```

UNIVARIATE TIME SERIES MODEL ERASED
PAGE 51 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

```
  ACF          VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	63
MEAN OF THE (DIFFERENCED) SERIES	=	11.3016
STANDARD ERROR OF THE MEAN	=	0.5410
T-VALUE OF MEAN (AGAINST ZERO)	=	20.8897

AUTOCORRELATIONS

1- 8	.09	.04	-.03	-.07	-.14	-.13	0.0	.10
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
9- 12	-.08	.08	-.03	-.01				
ST.E	.13	.13	.14	.14				
13- 20	-.18	-.02	.02	-.10	.06	.04	.08	-.03
ST.E	.14	.14	.14	.14	.14	.14	.14	.14
21- 25	-.12	-.09	-.16	-.08	.06			
ST.E	.14	.14	.14	.15	.15			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.090              +     IXX   +
 2  0.042              +     IX    +
 3 -0.034              +    XI     +
```

```
 4 -0.066               +   XXI     +
 5 -0.139               +  XXXI     +
 6 -0.130               +  XXXI     +
 7  0.001               +     I     +
 8  0.102               +     IXXX  +
 9 -0.078              +    XXI      +
10  0.078              +      IXX    +
11 -0.033              +     XI      +
12 -0.011              +      I      +
13 -0.183              + XXXXXI      +
14 -0.018              +      I      +
15  0.024              +      IX     +
16 -0.097              +    XXI      +
17  0.065              +      IXX    +
18  0.044              +      IX     +
19  0.083              +      IXX    +
20 -0.027              +     XI      +
21 -0.122              +   XXXI      +
22 -0.087              +    XXI      +
23 -0.155              +  XXXXI      +
24 -0.081              +    XXI      +
25  0.058              +      IX     +
```

```
PAGE  52     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

  PACF         VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         11.3016
STANDARD ERROR OF THE MEAN         =         0.5410
T-VALUE OF MEAN (AGAINST ZERO)     =        20.8897


PARTIAL AUTOCORRELATIONS

  1- 8      .09  .03 -.04 -.06 -.13 -.11  .03  .10
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12    -.12  .06 -.06 -.02
  ST.E      .13  .13  .13  .13

 13- 20    -.17  .02  .02 -.13  .08 -.03  .06 -.07
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.10 -.12 -.11 -.04  .02
  ST.E      .13  .13  .13  .13  .13
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.090               +     IXX  +
 2  0.035               +     IX   +
 3 -0.041               +    XI    +
 4 -0.062               +   XXI    +
 5 -0.127               +  XXXI    +
 6 -0.107               +  XXXI    +
 7  0.025               +     IX   +
 8  0.101               +     IXXX +
 9 -0.121               +  XXXI    +
10  0.059               +     IX   +
11 -0.062               +   XXI    +
12 -0.016               +     I    +
13 -0.166               + XXXXI    +
14  0.018               +     I    +
15  0.021               +     IX   +
16 -0.126               +  XXXI    +
17  0.075               +     IXX  +
18 -0.030               +    XI    +
19  0.063               +     IXX  +
20 -0.065               +   XXI    +
21 -0.102               +  XXXI    +
22 -0.123               +  XXXI    +
23 -0.112               +  XXXI    +
24 -0.042               +    XI    +
25  0.017               +     I    +
PAGE  53      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  54      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS
```

```
  ESTIMATION  RESIDUAL IS RGROUP3.
              TIME=1,63./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04



SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES

GROUP3     RANDOM              1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3      MEAN     1       0    11.3016

                                 ST  ERR   T-RATIO
                                  0.5410     20.89

RESIDUAL SUM OF SQUARES   =      1143.266357
DEGREES OF FREEDOM        =               62
RESIDUAL MEAN SQUARE      =        18.439774
PAGE  55     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS


ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
                      THAN 0.1000E-03



SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES
```

```
GROUP3     RANDOM              1-  84

PARAMETER VARIABLE    TYPE   FACTOR   ORDER ESTIMATE
     1   GROUP3       MEAN      1        0    11.3016

                                       ST  ERR   T-RATIO
                                        0.5410     20.89

RESIDUAL SUM OF SQUARES   =        1143.264160
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =                  62
RESIDUAL MEAN SQUARE      =          18.439743
PAGE  56     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ACF          VARIABLE IS RGROUP3.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =             63
MEAN OF THE (DIFFERENCED) SERIES =            0.0000
STANDARD ERROR OF THE MEAN          =           0.5410
T-VALUE OF MEAN (AGAINST ZERO)      =           0.0000


AUTOCORRELATIONS

  1-  8      .09  .04 -.03 -.07 -.14 -.13  0.0  .10
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.08  .08 -.03 -.01
  ST.E       .13  .13  .14  .14

 13- 20     -.18 -.02  .02 -.10  .06  .04  .08 -.03
  ST.E       .14  .14  .14  .14  .14  .14  .14  .14

 21- 25     -.12 -.09 -.16 -.08  .06
  ST.E       .14  .14  .14  .15  .15


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
```

```
                              I
 1  0.090               +      IXX    +
 2  0.042               +      IX     +
 3 -0.034               +     XI      +
 4 -0.066               +    XXI      +
 5 -0.139               +   XXXI      +
 6 -0.130               +   XXXI      +
 7  0.001               +      I      +
 8  0.102               +      IXXX   +
 9 -0.078              +     XXI       +
10  0.078              +       IXX     +
11 -0.033              +      XI       +
12 -0.011              +       I       +
13 -0.183              + XXXXXI        +
14 -0.018              +       I       +
15  0.024              +       IX      +
16 -0.097              +     XXI       +
17  0.065              +       IXX     +
18  0.044              +       IX      +
19  0.083              +       IXX     +
20 -0.027              +      XI       +
21 -0.122              +    XXXI       +
22 -0.087              +     XXI       +
23 -0.155              +   XXXXI       +
24 -0.081              +     XXI       +
25  0.058              +       IX      +
PAGE  57     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



 ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  58     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



 ARIMA        VARIABLE IS GROUP3.
              CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
```

```
INPUT  VARIABLE = NOISE
PAGE  59      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  60      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1      I2
PAGE  61      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ESTIMATION  RESIDUAL IS IGROUP3./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04
```

```
SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES

GROUP3     RANDOM             1-  84

I1         BINARY             1-  84

I2         BINARY             1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MEAN     1       0    11.6667
      2  I1            UP      1       0    -5.5833
      3  I2            UP      1       0     2.0833

                                  ST  ERR   T-RATIO
                                   0.4792     24.35
                                   1.1737     -4.76
                                   1.5153      1.37

RESIDUAL SUM OF SQUARES  =      1115.908691
DEGREES OF FREEDOM       =               81
RESIDUAL MEAN SQUARE     =        13.776650
PAGE  62     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS


ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
                      THAN 0.1000E-03


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES

GROUP3     RANDOM             1-  84

I1         BINARY             1-  84
```

I2 BINARY 1- 84

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	11.6667	0.4792	24.35
2	I1	UP	1	0	-5.5833	1.1738	-4.76
3	I2	UP	1	0	2.0833	1.5154	1.37

RESIDUAL SUM OF SQUARES = 1115.908936
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 13.776653
PAGE 63 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.4001
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

1- 8	-.02	.05	-.10	-.07	-.17	-.07	-.02	.07
ST.E	.11	.11	.11	.11	.11	.11	.11	.11
9- 12	-.15	.12	-.06	.07				
ST.E	.11	.12	.12	.12				
13- 20	-.24	.09	-.01	-.04	.03	.10	.06	.02
ST.E	.12	.12	.13	.13	.13	.13	.13	.13
21- 25	-.12	-.02	-.13	.06	.07			
ST.E	.13	.13	.13	.13	.13			

PLOT OF SERIAL CORRELATION

```
 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+ LAG CORR
                           I
 1 -0.018              +    I    +
 2  0.050              +    IX   +
 3 -0.095              +  XXI    +
 4 -0.066              +  XXI    +
 5 -0.165              +XXXXXI   +
 6 -0.075             +   XXI     +
 7 -0.017             +     I     +
 8  0.074             +     IXX   +
 9  -0.154              +  XXXXI      +  10   0.117              +
IXXX    +   11   -0.05               +       XI        +   12    0.06
+      IXX    +  13   -0:23            XXXXXXXI        +  14    0.09
+      IXX    +  15   -0.01      .       +       I     . +  16   -0.03
+     XI      +  17    0.03              +       IX      +  18    0.09
+      IXX    +  19    0.05             +       IX      +  20    0.017
+      I      +  21   -0.121            +    XXXI       +  22   -0.022
+     XI      +  23   -0.130            +    XXXI       +  24    0.060
+      IX     + 25   0.071           +      IXX    +
 PAGE   64      INTERVENTION ANALYSES -
 1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE   65      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE   66      INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS
```

```
  INDEP       VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  67     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  INDEP       VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  68     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  INDEP       VARIABLE IS CLOSE.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2        CLOSE
PAGE  69     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS



  ESTIMATION  RESIDUAL IS IGROUP3./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	11.7544	0.4927	23.85
2	I1	UP	1	0	-3.9163	2.4014	-1.63
3	I2	UP	1	0	2.0833	1.5187	1.37
4	CLOSE	UP	1	0	-1.7548	2.2037	-0.80

RESIDUAL SUM OF SQUARES = 1107.137207
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 13.839214
PAGE 70 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	11.7544	0.4927	23.85
2	I1	UP	1	0	-3.9170	2.4014	-1.63
3	I2	UP	1	0	2.0834	1.5188	1.37
4	CLOSE	UP	1	0	-1.7541	2.2036	-0.80

RESIDUAL SUM OF SQUARES = 1107.137451
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 13.839218
PAGE 71 INTERVENTION ANALYSES -
1ST TIME ALCOHOL AND DRUG ADMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.3985
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

```
  1- 8    -.01  .04 -.09 -.08 -.18 -.09 -.01  .09
 ST.E      .11  .11  .11  .11  .11  .11  .12  .12

  9- 12   -.14  .13 -.04  .06
 ST.E      .12  .12  .12  .12

 13- 20   -.23  .09  0.0 -.04  .04  .10  .06  .03
 ST.E      .12  .12  .13  .13  .13  .13  .13  .13

 21- 25   -.09  0.0 -.14  .04  .05
 ST.E      .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.006               +    I    +
 2  0.045               +    IX   +
 3 -0.087               +  XXI    +
 4 -0.078               +  XXI    +
 5 -0.179               +XXXXI    +
 6 -0.088              +   XXI     +
 7 -0.008              +     I     +
 8  0.089              +     IXX   +
 9 -0.135              +  XXXI     +
10  0.126              +     IXXX  +
11 -0.042              +    XI     +
12  0.059              +     IX    +
13 -0.227              XXXXXXI     +
14  0.088              +     IXX   +
15 -0.002              +     I     +
16 -0.037              +    XI     +
17  0.041              +     IX    +
18  0.100              +     IXX   +
19  0.062              +     IXX   +
20  0.028              +     IX    +
21 -0.095              +   XXI     +
22 -0.005              +     I     +
23 -0.137              +  XXXI     +
24  0.042              +     IX    +
25  0.053              +     IX    +
PAGE  72     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS
```

```
END/


NUMBER OF INTEGER WORDS OF STORAGE USED IN
                PRECEDING  PROBLEM  4708
CPU TIME USED      8.593 SECONDS
PAGE  73     INTERVENTION ANALYSES -
1ST TIME ALCOHOL  AND DRUG ADMISSIONS

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
    JULY 19, 1982  AT 11:53:29


PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED
```

AD Readmissions

```
//L84SAL JOB (3084,028A,,10),'LUEGER',TIME=(0,30),CLASS=6
/*JOBPARM Q=FETCH,I
//STEP1  EXEC  BIMED,PROG=BMDP2T
//FT06F001 DD DSN=&&TEMP1,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD *
/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'ANALYSES FOR ALCOHOL & DRUG
                READMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'.
/ VARIABLE      NAMES = SHAWNEE, JOHNSON, WYANDOT,
                SUNFLOW,SCENTRL, ECENTRL, COWLEY,
                AREA, COUNSEL,IROQUOIS, HPLAINS,
                KANZA, SEAST, MHINSTIT,
                FOURCO, BERTNASH, NEAST, SWEST,
                MIAMI,NCENTRL, PRAIRIE, FRANKLIN,
                LABETTE,CRAWFORD, SEDGWICK,
                CENTRAL, I1, I2, CLOSE,
                GROUP1, GROUP2, GROUP3, TOTAL.
                ADD =  4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS
                         + IROQUOIS + NEAST +
                         SUNFLOW + NCENTRL + SEAST.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY
                         + SCENTRL + ECENTRL +
                         FOURCO + SWEST
                         + COUNSEL + BERTNASH +
                         PRAIRIE + CENTRAL + KANZA
                         + CRAWFORD.
                GROUP3 = SHAWNEE + AREA + MIAMI +
                         FRANKLIN + LABETTE.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT
                         + SUNFLOW + SCENTRL + ECENTRL
                         + COWLEY + AREA + COUNSEL +
                         IROQUOIS + HPLAINS + KANZA
                         + SEAST + MHINSTIT +
                         FOURCO + BERTNASH + NEAST
                         + SWEST + MIAMI + NCENTRL
                         + PRAIRIE + FRANKLIN +
                         LABETTE + CRAWFORD + SEDGWICK
                         + CENTRAL.
/ SAVE          NEW. UNIT=4. CODE=TEMP.
/ END
14 4 6 0 0 0 0 0 1 0 0 1 1 0 1 4 2 1 0 2 0 0 1 0 0 1 0 0 0
 4 3 3 0 1 3 0 1 0 0 0 0 1 1 1 1 2 0 0 2 2 1 1 1 3 1 0 0 0
 8 8 3 0 0 0 0 1 2 0 0 2 4 2 1 0 2 0 1 0 0 0 0 0 3 2 0 0 0
```

20	5	9	0	0	1	1	0	0	0	0	1	3	1	1	0	2	0	3	1	0	1	0	0	2	2	0	0	0
12	4	8	0	0	1	0	0	0	1	1	1	1	0	3	0	2	0	1	1	1	0	2	0	12	0	0	0	0
17	7	3	0	1	1	0	1	1	0	1	2	5	2	1	2	0	0	2	1	0	0	2	1	2	1	0	0	0
8	1	6	0	0	1	1	0	1	0	0	1	5	0	1	0	0	0	0	5	0	0	3	1	2	1	0	0	0
8	7	4	1	1	1	0	0	1	0	0	0	3	0	0	1	3	0	1	1	1	0	0	2	0	1	0	0	0
8	4	13	0	1	2	1	0	1	0	2	1	3	0	2	1	1	0	1	2	1	1	1	1	0	0	0	0	0
13	5	8	0	0	1	0	0	1	1	0	0	0	0	3	1	0	0	1	0	0	2	2	0	1	1	0	0	0
5	5	6	0	1	1	2	1	0	0	0	1	3	0	0	1	1	0	0	1	0	1	1	0	0	0	0	0	0
6	3	4	0	0	1	1	0	0	0	0	3	5	0	1	2	0	0	1	0	0	0	1	1	0	1	0	0	0
11	6	7	0	0	0	1	0	1	0	0	0	3	0	0	2	3	0	3	2	0	2	3	0	1	1	0	0	0
7	6	6	0	1	0	0	1	2	0	1	2	2	0	3	0	0	1	2	1	0	1	1	3	2	0	0	0	0
4	8	14	0	3	4	0	4	3	0	1	0	3	1	2	0	6	0	1	2	0	0	3	0	1	0	0	0	0
6	14	7	0	0	1	2	3	1	0	1	2	2	2	0	1	2	1	0	0	0	0	3	0	2	1	0	0	0
3	8	9	0	1	0	0	1	4	0	1	0	4	0	3	3	4	0	1	2	2	0	1	2	3	2	0	0	0
3	2	7	0	2	0	0	1	3	0	2	0	5	0	4	1	0	2	1	2	1	0	0	0	1	0	0	0	0
18	4	3	0	0	0	2	1	2	1	0	1	2	0	1	1	3	0	2	4	0	0	0	0	1	1	0	0	0
16	6	4	0	1	1	0	0	1	0	1	6	2	0	3	1	2	0	1	2	0	1	1	0	0	1	0	0	0
7	2	4	1	1	0	1	0	0	0	0	1	3	0	4	0	3	0	3	2	0	0	1	0	1	1	0	0	0
10	3	8	0	2	0	0	0	3	0	0	1	1	0	3	1	4	0	0	1	1	0	1	0	3	0	0	0	0
5	2	7	0	1	0	0	0	2	0	0	2	2	1	0	0	2	0	1	0	0	0	2	2	2	0	0	0	0
6	5	10	0	3	2	0	0	0	0	0	1	3	1	2	2	0	0	1	2	0	0	2	0	1	0	0	0	0
5	5	10	0	2	0	0	3	3	3	0	3	9	1	3	0	5	2	2	0	1	1	4	3	2	0	0	0	0
2	6	12	0	2	0	0	3	4	0	5	0	7	0	3	0	0	0	5	1	1	1	3	0	2	0	0	0	0
8	4	13	0	3	1	0	4	8	1	3	0	8	3	1	0	2	0	0	5	0	0	3	3	4	1	0	0	0
1	13	6	0	1	0	0	3	9	0	3	0	1	4	3	1	2	0	1	1	2	2	1	1	4	2	0	0	0
5	3	8	0	0	1	0	4	8	0	3	2	2	2	2	0	0	0	4	1	0	0	1	0	5	1	0	0	0
6	7	4	0	2	1	0	1	9	1	4	0	1	0	5	1	1	0	1	1	2	1	1	1	6	2	0	0	0
4	11	12	0	2	1	0	2	3	0	3	3	1	2	2	1	2	0	2	1	0	0	1	0	1	0	0	0	0
7	5	4	0	1	1	0	0	10	1	0	0	2	1	2	1	2	0	1	0	0	0	0	1	1	1	0	0	0
7	2	4	0	0	0	0	0	1	0	2	3	1	2	2	1	1	1	0	0	0	0	0	0	1	1	0	0	0
8	3	3	0	0	0	0	0	3	1	1	0	0	2	0	0	0	1	0	2	1	0	0	0	3	0	0	0	0
5	0	1	0	0	1	0	2	5	1	2	1	0	0	0	1	0	0	0	4	1	0	0	0	2	1	0	0	0
5	1	4	0	0	0	0	0	5	0	0	0	0	1	0	1	1	0	0	1	1	0	0	0	2	0	0	0	0
6	2	2	0	0	0	0	7	9	0	5	0	0	2	1	0	0	1	3	0	0	0	1	1	8	2	0	0	0
4	6	11	0	0	1	1	8	6	1	9	0	0	3	4	1	0	1	3	0	0	0	1	0	3	0	0	0	0
8	8	9	0	1	2	1	6	2	2	3	1	0	1	3	0	5	2	1	1	0	2	2	3	3	0	0	0	0
4	8	9	0	1	0	0	5	5	5	2	1	4	4	1	3	0	1	6	0	0	2	1	2	3	2	0	0	0
4	12	5	0	1	2	0	6	13	1	4	1	2	3	6	2	2	0	3	1	1	1	2	1	5	2	0	0	0
9	5	8	0	1	2	0	3	11	2	3	2	2	8	6	1	0	0	6	1	2	0	2	1	7	0	0	0	0
4	6	7	0	1	0	0	4	17	1	2	1	0	4	1	1	1	2	0	0	1	2	0	1	3	2	0	0	0
11	2	6	0	0	1	0	2	13	1	2	0	1	5	2	2	2	3	2	1	4	0	1	0	4	3	0	0	0
7	5	6	0	1	0	0	5	6	0	6	2	3	1	1	1	0	0	4	0	2	1	1	0	6	0	0	0	0
9	6	5	0	0	0	0	5	4	0	2	0	1	1	2	0	1	0	0	1	1	2	1	0	7	1	0	0	0
6	1	7	0	0	1	0	1	13	1	4	1	1	4	2	2	0	0	4	1	0	0	0	0	4	1	0	0	0
6	5	1	0	0	1	0	4	10	2	2	1	2	3	3	0	0	0	0	0	1	1	0	0	5	1	0	0	0
1	5	7	0	1	1	1	2	4	0	4	1	6	8	6	1	2	0	2	0	0	0	3	0	2	0	0	0	0
5	7	7	0	0	2	0	1	2	0	2	1	3	2	3	0	2	0	1	1	0	1	0	1	2	1	0	0	0
2	5	7	0	0	1	2	8	6	0	4	0	3	1	3	1	1	0	1	0	0	1	2	0	0	0	0	0	0
4	10	12	0	1	2	0	1	4	1	3	1	3	2	2	1	0	0	1	0	0	1	1	0	2	0	0	0	0
7	4	15	0	2	0	1	1	16	0	6	0	1	2	4	1	0	2	1	1	0	2	4	3	1	0	0	0	0

```
0 8 7 0 0 0 1 217 0 5 0 6 2 0 1 3 2 4 0 1 1 2 2 1 0 0 0 0
6 5 9 0 2 2 0 4 8 0 7 0 6 2 2 1 2 0 3 1 0 1 2 1 1 0 0 0 0
7 6 8 0 2 2 0 6 8 1 2 3 3 2 6 1 2 0 3 1 0 0 0 2 3 0 0 0 0
4 7 8 0 1 0 1 411 0 6 1 4 5 3 0 1 0 2 0 0 1 2 0 3 1 0 0 0
5 6 5 0 0 1 0 314 1 0 0 9 4 3 0 1 2 6 1 0 1 2 0 2 1 0 0 0
4 311 1 2 0 0 4 5 0 4 0 4 1 4 1 4 0 5 1 0 2 3 0 3 0 0 0 0
5 4 4 0 0 1 0 310 0 2 0 9 1 3 1 1 0 2 0 0 0 2 3 0 2 0 0 0
2 2 6 0 0 1 0 1 8 0 0 0 1 1 1 0 2 1 1 1 0 0 1 0 0 0 0 0 1
0 5 3 0 1 1 0 1 8 0 0 0 2 1 2 0 0 1 2 0 0 1 1 1 3 0 0 0 1
1 4 9 0 0 1 0 2 7 1 2 0 4 2 2 2 3 3 2 0 0 0 1 1 3 0 0 0 1
0 2 7 0 1 0 1 3 8 0 2 1 3 2 0 2 1 2 3 0 0 1 3 5 0 0 1 0 1
1 7 6 0 0 1 0 611 0 3 0 3 1 2 1 1 1 4 0 0 1 2 0 1 0 1 0 1
0 6 7 0 0 0 0 0 5 0 5 1 1 1 1 0 0 1 5 0 0 0 1 2 1 0 1 0 1
2 7 7 0 1 1 0 220 0 2 0 4 3 6 0 2 0 5 1 0 1 2 3 1 0 1 0 1
1 4 5 0 1 1 1 113 0 0 0 4 5 3 0 2 1 5 0 0 0 0 3 3 0 1 0 1
1 2 1 0 0 0 0 214 0 1 1 1 2 2 0 1 1 3 0 0 1 2 1 0 0 1 0 1
0 6 6 0 1 1 0 617 0 0 0 2 2 1 1 1 0 2 0 0 0 0 3 3 1 1 0 1
1 6 8 2 0 0 0 3 7 1 1 0 1 4 2 0 1 1 4 0 1 0 2 0 1 0 1 0 1
1 4 6 0 1 0 0 211 0 0 0 4 1 1 0 0 0 5 0 0 1 1 0 1 0 1 0 1
1 9 8 0 1 1 0 3 7 0 1 0 3 0 1 0 1 2 0 1 0 1 0 3 2 0 1 1 1
1 3 9 0 0 1 0 0 5 0 1 0 4 4 5 0 2 0 1 0 0 0 2 0 2 0 1 1 1
0 317 0 0 0 0 210 0 2 0 3 1 4 0 0 0 2 0 0 0 1 0 1 0 1 1 1
0 5 5 0 1 3 1 1 7 0 1 0 2 2 3 1 1 1 1 3 0 0 1 0 1 0 1 1 1
0 3 5 0 0 0 0 3 6 0 1 0 4 0 3 0 1 1 2 0 0 0 1 2 1 0 1 1 1
1 210 0 0 1 0 0 5 0 1 3 2 0 7 0 0 0 3 1 0 0 1 2 2 0 1 1 1
2 4 6 0 0 0 0 110 0 1 1 4 3 2 0 0 0 1 0 0 0 1 1 1 1 1 1 1
2 510 0 0 2 0 311 1 2 1 1 1 2 0 1 2 6 0 0 0 2 2 2 0 1 1 1
1 7 6 0 1 0 0 6 7 1 1 0 4 1 2 3 3 0 4 1 0 0 3 2 0 0 1 1 1
0 4 8 0 1 1 0 612 0 2 1 3 1 2 0 1 0 6 0 1 0 2 2 0 1 1 1 1
1 1 4 0 0 2 0 310 1 3 0 6 3 1 0 0 1 1 0 0 0 1 0 0 0 1 1 1
0 2 5 0 0 1 0 0 5 0 0 0 2 0 2 0 0 2 4 0 1 0 1 0 1 0 1 1 1
/ END
 TPLOT        VARIABLES ARE GROUP1, GROUP2, GROUP3.
              COMMON./
 ACF          VARIABLE IS GROUP1.
              MAXLAG IS 25.
              TIME=1,63./
 PACF         VARIABLE IS GROUP1.
              MAXLAG IS 25.
              TIME=1,63./
 ACF          VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
 PACF         VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
 ARIMA        VARIABLE IS GROUP1.
              DFORDER IS 1.CONSTANT./
```

```
ESTIMATION  RESIDUAL IS RGROUP1.
            TIME=1,63./
ACF         VARIABLE IS RGROUP1.
            MAXLAG IS 25.
            TIME=1,63./
ERASE       MODEL./
ARIMA       VARIABLE IS GROUP1.
            DFORDER IS 1.CONSTANT./
INDEP       VARIABLE IS I1.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS I2.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
ESTIMATION  RESIDUAL=IGROUP1./
ACF         VARIABLE IS IGROUP1.
            MAXLAG IS 25./
ERASE       MODEL./
ARIMA       VARIABLE IS GROUP1.
            DFORDER IS 1.CONSTANT./
INDEP       VARIABLE IS I1.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS I2.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
INDEP       VARIABLE IS CLOSE.
            DFORDER IS 1.
            UPORDER IS '(0)'.
            TYPE IS BINARY./
ESTIMATION  RESIDUAL=IGROUP1./
ACF         VARIABLE IS IGROUP1.
            MAXLAG IS 25./
ERASE       MODEL./
ACF         VARIABLE IS GROUP2.
            MAXLAG IS 25.
            TIME=1,63./
PACF        VARIABLE IS GROUP2.
            MAXLAG IS 25.
            TIME=1,63./
ACF         VARIABLE IS GROUP2.
            DFORDER IS 1.
            MAXLAG IS 25.
            TIME=1,63./
PACF        VARIABLE IS GROUP2.
            DFORDER IS 1.
```

```
                MAXLAG IS 25.
                TIME=1,63./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAORDER IS '(1)'./
ESTIMATION      RESIDUAL IS RGROUP2.
                TIME=1,63./
ACF             VARIABLE IS RGROUP2.
                MAXLAG IS 25.
                TIME=1,63./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP2./
ACF             VARIABLE IS IGROUP2.
                MAXLAG IS 25./
ERASE           MODEL./
ARIMA           VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAORDER IS '(1)'./
INDEP           VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
INDEP           VARIABLE IS CLOSE.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
ESTIMATION      RESIDUAL=IGROUP2./
ACF             VARIABLE IS IGROUP2.
                MAXLAG IS 25./
ERASE           MODEL./
ACF             VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./
PACF            VARIABLE IS GROUP3.
                MAXLAG IS 25.
```

```
              TIME=1,63./
ARIMA         VARIABLE IS GROUP3.CONSTANT./
ESTIMATION    RESIDUAL IS RGROUP3.
              TIME=1,63./
ACF           VARIABLE IS RGROUP3.
              MAXLAG IS 25.
              TIME=1,63./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP3.CONSTANT./
INDEP         VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL=IGROUP3./
ACF           VARIABLE IS IGROUP3.
              MAXLAG IS 25./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP3.CONSTANT./
INDEP         VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS CLOSE.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL=IGROUP3./
ACF           VARIABLE IS IGROUP3.
              MAXLAG IS 25./
END/
//STEP2  EXEC SAS,OPTIONS='NOSOURCE'
//IN     DD DSN=&&TEMP1,DISP=(OLD,DELETE)
//OUT    DD DSN=&&TEMP2,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD DSN=L84SAL.SAS.CNTL(FIGURES),DISP=SHR
//STEP3 EXEC IEBGENER
//SYSUT1 DD DSN=&&TEMP2,DISP=(OLD,DELETE)
//SYSUT2 DD DSN=L84SAL.ADREAD,DCB=(RECFM=FB,LRECL=133,
   BLKSIZE=931),
//  DISP=(,CATLG,DELETE),SPACE=(TRK,(2,5),RLSE),UNIT=SYSTS,
//  LABEL=RETPD=120,VOL=SER=LD5010
//SYSIN  DD DUMMY
//
```

PAGE 1

```
BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY 19, 1982  AT 11:54:51

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'ANALYSES FOR ALCOHOL & DRUG
                READMISSIONS'.
/ INPUT         VARIABLES ARE 29.
                FORMAT IS '(29F2.0)'.
/ VARIABLE      NAMES = SHAWNEE, JOHNSON, WYANDOT,
                SUNFLOW, SCENTRL, ECENTRL, COWLEY,
                AREA, COUNSEL, IROQUOIS, HPLAINS,
                KANZA, SEAST, MHINSTIT, FOURCO,
                BERTNASH, NEAST, SWEST, MIAMI,
                NCENTRL, PRAIRIE, FRANKLIN, LABETTE,
                CRAWFORD,
                SEDGWICK, CENTRAL, I1, I2, CLOSE,
                GROUP1, GROUP2, GROUP3, TOTAL.
                ADD =  4.
/ TRANSFORM     GROUP1 = JOHNSON + SEDGWICK + HPLAINS
                         + IROQUOIS + NEAST +
                         SUNFLOW +
                         NCENTRL + SEAST.
                GROUP2 = WYANDOT + MHINSTIT + COWLEY
                         + SCENTRL + ECENTRL +
                         FOURCO + SWEST + COUNSEL
                         + BERTNASH + PRAIRIE +
                         CENTRAL + KANZA +
                         CRAWFORD.
                GROUP3 = SHAWNEE + AREA + MIAMI +
                         FRANKLIN + LABETTE.
                TOTAL =  SHAWNEE + JOHNSON + WYANDOT +
                         SUNFLOW + SCENTRL + ECENTRL +
                         COWLEY + AREA + COUNSEL +
                         IROQUOIS + HPLAINS + KANZA +
                         SEAST + MHINSTIT + FOURCO +
                         BERTNASH + NEAST + SWEST +
                         MIAMI + NCENTRL + PRAIRIE +
                         FRANKLIN + LABETTE +
```

```
                        CRAWFORD + SEDGWICK + CENTRAL.
/ SAVE          NEW. UNIT=4. CODE=TEMP.
/ END
PROBLEM TITLE IS
ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

NUMBER OF VARIABLES TO READ IN                          29
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS             4
TOTAL NUMBER OF VARIABLES                               33
NUMBER OF CASES TO READ IN                      .   TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS       NEITHER
BLANKS ARE                                         MISSING
INPUT UNIT NUMBER                                        5
REWIND INPUT UNIT PRIOR TO READING    DATA              NO
NUMBER OF WORDS OF DYNAMIC STORAGE                   45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT                1

***** TRAN     PARAGRAPH IS USED *****
```

VARIABLES TO BE USED

1	SHAWNEE	2	JOHNSON	3	WYANDOT
4	SUNFLOW	5	SCENTRL	6	ECENTRL
7	COWLEY	8	AREA	9	COUNSEL
10	IROQUOIS	11	HPLAINS	12	KANZA
13	SEAST	14	MHINSTIT	15	FOURCO
16	BERTNASH	17	NEAST	18	SWEST
19	MIAMI	20	NCENTRL	21	PRAIRIE
22	FRANKLIN	23	LABETTE	24	CRAWFORD
25	SEDGWICK	26	CENTRAL	27	I1
28	I2	29	CLOSE	30	GROUP1
31	GROUP2	32	GROUP3	33	TOTAL

INPUT FORMAT IS
(29F2.0)
MAXIMUM LENGTH DATA RECORD IS 58 CHARACTERS
I N P U T   V A R I A B L E S

VARIABLE INDEX	VARIABLE NAME	RECORD NO	COLUMNS BEGIN	COLUMNS END	FIELD WIDTH	TYPE
1	SHAWNEE	1	1	2	2	F
2	JOHNSON	1	3	4	2	F
3	WYANDOT	1	5	6	2	F
4	SUNFLOW	1	7	8	2	F
5	SCENTRL	1	9	10	2	F
6	ECENTRL	1	11	12	2	F
7	COWLEY	1	13	14	2	F
8	AREA	1	15	16	2	F
9	COUNSEL	1	17	18	2	F
10	IROQUOIS	1	19	20	2	F
11	HPLAINS	1	21	22	2	F
12	KANZA	1	23	24	2	F
13	SEAST	1	25	26	2	F
14	MHINSTIT	1	27	28	2	F
15	FOURCO	1	29	30	2	F
16	BERTNASH	1	31	32	2	F
17	NEAST	1	33	34	2	F
18	SWEST	1	35	36	2	F
19	MIAMI	1	37	38	2	F
20	NCENTRL	1	39	40	2	F
21	PRAIRIE	1	41	42	2	F
22	FRANKLIN	1	43	44	2	F
23	LABETTE	1	45	46	2	F
24	CRAWFORD	1	47	48	2	F
25	SEDGWICK	1	49	50	2	F
26	CENTRAL	1	51	52	2	F
27	I1	1	53	54	2	F
28	I2	1	55	56	2	F
29	CLOSE	1	57	58	2	F

```
-----------------------------------------
BMDP FILE IS BEING WRITTEN ON UNIT       4
CODE.     IS      TEMP
CONTENT   IS      DATA
LABEL     IS
     JULY 19, 1982      11:54:51
VARIABLES ARE
     1 SHAWNEE      2 JOHNSON      3 WYANDOT
     4 SUNFLOW      5 SCENTRL      6 ECENTRL
     7 COWLEY       8 AREA         9 COUNSEL
    10 IROQUOIS    11 HPLAINS     12 KANZA
    13 SEAST       14 MHINSTIT    15 FOURCO
    16 BERTNASH    17 NEAST       18 SWEST
    19 MIAMI       20 NCENTRL     21 PRAIRIE
    22 FRANKLIN    23 LABETTE     24 CRAWFORD
    25 SEDGWICK    26 CENTRAL     27 I1
    28 I2          29 CLOSE       30 GROUP1
    31 GROUP2      32 GROUP3      33 TOTAL
BASED ON INPUT FORMAT SUPPLIED
1 RECORDS READ PER CASE

NUMBER OF CASES READ                 84

BMDP   FILE ON UNIT  4 HAS BEEN COMPLETED
-----------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE    2      ANALYSES FOR ALCOHOL & DRUG  READMISSIONS



  TPLOT         VARIABLES ARE GROUP1, GROUP2, GROUP3.
                COMMON./

SYMBOL FOR VARIABLE GROUP1    IS    A
SYMBOL FOR VARIABLE GROUP2    IS    B
SYMBOL FOR VARIABLE GROUP3    IS    C

       5.00      15.0      25.0      35.0      45.0
            10.0      20.0      30.0      40.0
     .---+----+----+----+----+----+----+----+----+---
     I       A     *
     I     C   A  B
     I       C B     A
     I          A  B       C
   5 +           BC      A
     I            BA     C
     I        C *
     I      C  B  A
     I        CA           B
  10 +     A       B  C
```

```
    I      C A B
    I      *     B
    I          B  A   C
    I          *     B
 15 +          C        A     B
    I          C     B  A
    I    C               A   B
    I   C      A       B
    I         B   A     C
 20 +           A    BC
    I         C*
    I         CA      B
    I      *      B
    I       C A         B
 25 +             C        A   B
    I            C      AB
    I             C           A     B
    I      C               A    B
    I            *         B
 30 +        C          A     B
    I       C         A      B
    I      C  A          B
    I     *       B
    I      C *
 35 +     C A B
    I   *      B
    I             A CB
    I              C  A        B
    I                 C  A  B
 40 +                C   A      B
    I              C          A         B
    I                  *                     B
    I        C  A                        B
    I           A  C                      B
 45 +                C *
    I            B  CA
    I         CA                  B
    I         C    A    B
    I      C          A          B
 50 +      C        A B
    I           AC      B
    I      C          A     B
    I           A C                              B
    I       C             A         B
 55 +              C     A    B
    I              C A               B
    I           C       A         B
    I               C  A         B
    I                C A   B
 60 +          C   A        B
```

```
     I   CA           B
     I   C    A       B
     I    C          A         B
     I      A C                  B
  65 +            CA       B
     I    C      A    B
     I          C    A                       B
     I     C     A                   B
     I   A   C            B
  70 +      C   A                    B
     I        C  A         B
     I       AC         B
     I   C           A     B
     I  C       A           B
  75 +   C   A                      B
     I C         A          B
     I    C   A      B
     I   C  A                   B
     I   C    A             B
  80 +          AC                 B
     I            C  A    B
     I        A   C               B
     I    C    A         B
     I   *          B
```

```
PAGE   3     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF           VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./

NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =       15.7143
STANDARD ERROR OF THE MEAN        =        0.6767
T-VALUE OF MEAN (AGAINST ZERO)    =       23.2206

AUTOCORRELATIONS

  1-  8      .50  .21  .04 -.18 -.35 -.40 -.39 -.17
  ST.E       .13  .15  .16  .16  .16  .17  .19  .20

  9- 12     -.01  .21  .30  .26
  ST.E       .20  .20  .21  .21

 13- 20      .23  .24  .06 -.14 -.13 -.15 -.18 -.16
  ST.E       .22  .22  .23  .23  .23  .23  .23  .23

 21- 25     -.12  .03  .02  .11  .15
  ST.E       .23  .23  .23  .23  .24
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.496              +     IXXXXX+XXXXXX
 2  0.213            +       IXXXXX  +
 3  0.043            +       IX      +
 4 -0.183            +  XXXXXI       +
 5 -0.354           X+XXXXXXXI       +
 6 -0.399          X+XXXXXXXXI        +
 7 -0.385          X+XXXXXXXXI        +
 8 -0.165          +     XXXXI         +
 9 -0.010          +         I         +
10  0.207          +         IXXXXX    +
11  0.301          +         IXXXXXXXX +
12  0.261          +         IXXXXXXX  +
13  0.233         +          IXXXXXX    +
14  0.242         +          IXXXXXX    +
15  0.059         +          IX         +
16 -0.140         +       XXXI          +
17 -0.128         +       XXXI          +
18 -0.154         +      XXXXI          +
19 -0.182         +     XXXXXI          +
20 -0.159         +      XXXXI          +
21 -0.124         +       XXXI          +
22  0.034        +           IX          +
23  0.022        +           IX          +
24  0.111        +           IXXX        +
25  0.152        +           IXXXX       +
```

```
PAGE    4     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  PACF          VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./

NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =        15.7143
STANDARD ERROR OF THE MEAN        =         0.6767
T-VALUE OF MEAN (AGAINST ZERO)    =        23.2206

PARTIAL AUTOCORRELATIONS

  1- 8       .50 -.04 -.06 -.23 -.23 -.16 -.15  .10
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      0.0  .16  .02 -.05
  ST.E       .13  .13  .13  .13
```

13- 20	.04	.16	0.0	-.09	.15	-.01	-.03	-.07
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	-.07	.10	-.16	.10	-.05			
ST.E	.13	.13	.13	.13	.13			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0:6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.496                +     IXXXXX+XXXXXX
 2 -0.044                +    XI     +
 3 -0.061                +   XXI     +
 4 -0.229                XXXXXXI     +
 5 -0.225                XXXXXXI     +
 6 -0.157                + XXXXI     +
 7 -0.152                + XXXXI     +
 8  0.103                +     IXXX  +
 9 -0.003                +     I     +
10  0.162                +     IXXXX +
11  0.019                +     I     +
12 -0.053                +    XI     +
13  0.037                +     IX    +
14  0.164                +     IXXXX +
15 -0.000                +     I     +
16 -0.090                +   XXI     +
17  0.148                +     IXXXX +
18 -0.007                +     I     +
19 -0.028                +    XI     +
20 -0.068                +   XXI     +
21 -0.072                +   XXI     +
22  0.098                +     IXX   +
23 -0.157                + XXXXI     +
24  0.098                +     IXX   +
25 -0.050                +    XI     +
```

PAGE 5 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

```
 ACF          VARIABLE IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	62
MEAN OF THE (DIFFERENCED) SERIES	=	0.1290
STANDARD ERROR OF THE MEAN	=	0.6812
T-VALUE OF MEAN (AGAINST ZERO)	=	0.1894

AUTOCORRELATIONS

1- 8	-.21	-.09	.03	-.02	-.15	-.07	-.20	.05
ST.E	.13	.13	.13	.13	.13	.14	.14	.14
9- 12	-.08	.14	.12	.02				
ST.E	.14	.14	.15	.15				
13- 20	-.05	.23	.02	-.21	0.0	.01	-.05	-.02
ST.E	.15	.15	.15	.15	.16	.16	.16	.16
21- 25	-.13	.15	-.09	.10	.11			
ST.E	.16	.16	.16	.16	.16			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.212              +XXXXXI     +
 2 -0.089              +   XXI     +
 3  0.033             +      IX     +
 4 -0.024             +     XI      +
 5 -0.152             +  XXXXI      +
 6 -0.072             +    XXI      +
 7 -0.201             + XXXXXI      +
 8  0.050             +      IX     +
 9 -0.083             +    XXI      +
10  0.143             +      IXXXX  +
11  0.123             +      IXXX   +
12  0.019             +      I      +
13 -0.052             +     XI      +
14  0.228             +      IXXXXXX+
15  0.018             +      I      +
16 -0.207             + XXXXXI      +
17 -0.004            +       I       +
18  0.011            +       I       +
19 -0.054            +      XI       +
20 -0.017            +       I       +
21 -0.132            +    XXXI       +
22  0.152            +       IXXXX   +
23 -0.089            +     XXI       +
24  0.100            +       IXX     +
25  0.105            +       IXXX    +
```

PAGE 6 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

PACF VARIABLE IS GROUP1.

```
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./

NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =          0.1290
STANDARD ERROR OF THE MEAN          =        0.6812
T-VALUE OF MEAN (AGAINST ZERO)      =        0.1894


PARTIAL AUTOCORRELATIONS

  1-  8     -.21 -.14 -.02 -.03 -.17 -.17 -.34 -.18
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.30 -.11 -.03 -.10
  ST.E       .13  .13  .13  .13

 13- 20     -.24 -.01  .07 -.16 -.04  0.0  .05  .05
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.12  .08 -.13  .04  .03
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.212              +XXXXXI     +
 2 -0.140              +  XXXI     +
 3 -0.019              +     I     +
 4 -0.035              +    XI     +
 5 -0.174              + XXXXI     +
 6 -0.172              + XXXXI     +
 7 -0.341           XXX+XXXXXI     +
 8 -0.180              +XXXXXI     +
 9 -0.298             X+XXXXXI     +
10 -0.106              +  XXXI     +
11 -0.033              +    XI     +
12 -0.097              +   XXI     +
13 -0.235              XXXXXXI     +
14 -0.009              +     I     +
15  0.065              +     IXX   +
16 -0.161              + XXXXI     +
17 -0.039              +    XI     +
18 -0.005              +     I     +
19  0.048              +     IX    +
```

```
20  0.054              +     IX    +
21 -0.116              +  XXXI     +
22  0.080              +     IXX   +
23 -0.129              +  XXXI     +
24  0.042              +     IX    +
25  0.033              +     IX    +

PAGE   7     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE   8     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL IS RGROUP1.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES

                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                            1
GROUP1     RANDOM              1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1      TRND     1       0     0.1290

                                      ST  ERR   T-RATIO
                                       0.6815      0.19

RESIDUAL SUM OF SQUARES  =      1754.962646
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =        28.769867

PAGE   9     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS
```

```
ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
                      THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP1     RANDOM              1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
     1   GROUP1      TRND     1       0     0.1290

                                    ST  ERR   T-RATIO
                                     0.6812     0.19

RESIDUAL SUM OF SQUARES  =      1754.963379
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                61
RESIDUAL MEAN SQUARE     =        28.769882

PAGE  10     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS              =           62
MEAN OF THE (DIFFERENCED) SERIES =          0.0000
STANDARD ERROR OF THE MEAN          =       0.6812
T-VALUE OF MEAN (AGAINST ZERO)      =       0.0000


AUTOCORRELATIONS

  1-  8     -.21 -.09  .03 -.02 -.15 -.07 -.20  .05
  ST.E       .13  .13  .13  .13  .13  .14  .14  .14

  9- 12     -.08  .14  .12  .02
  ST.E       .14  .14  .15  .15

 13- 12     -.05  .23  .02 -.21  0.0  .01 -.05 -.02
  ST.E       .15  .15  .15  .15  .16  .16  .16  .16

 21- 25     -.13  .15 -.09  .10  .11
```

```
  ST.E       .16  .16  .16  .16  .16


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.212                 +XXXXXI     +
 2 -0.089                 +  XXI      +
 3  0.033                +      IX     +
 4 -0.024                +     XI      +
 5 -0.152                +  XXXXI      +
 6 -0.072                +    XXI      +
 7 -0.201                + XXXXXI      +
 8  0.050                +      IX     +
 9 -0.083                +    XXI      +
10  0.143                +      IXXXX  +
11  0.123                +      IXXX   +
12  0.019                +      I      +
13 -0.052                +     XI      +
14  0.228                +      IXXXXXX+
15  0.018                +      I      +
16 -0.207                + XXXXXI      +
17 -0.004               +       I       +
18  0.011               +       I       +
19 -0.054               +      XI       +
20 -0.017               +       I       +
21 -0.132               +    XXXI       +
22  0.152               +       IXXXX   +
23 -0.089               +     XXI       +
24  0.100               +       IXX     +
25  0.105               +       IXXX    +

PAGE  11     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  12     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
```

```
PAGE  13     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  14     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1        I2
PAGE  15     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL=IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES
                                          1
GROUP1     RANDOM            1-  84  (1-B  )
                                          1
I1         BINARY            1-  84  (1-B  )
                                          1
I2         BINARY            1-  84  (1-B  )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       TRND    1       0    -0.0371
      2  I1            UP     1       0    -8.9628
```

```
      3  I2            UP       1       0     8.0370

                                       ST  ERR   T-RATIO
                                        0.5770     -0.06
                                        5.2196     -1.72
                                        5.2196      1.54

RESIDUAL SUM OF SQUARES  =        2152.879883
DEGREES OF FREEDOM       =                 80
RESIDUAL MEAN SQUARE     =          26.910995

PAGE  16     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                  1
GROUP1      RANDOM             1-  84  (1-B   )
                                                  1
I1          BINARY             1-  84  (1-B   )
                                                  1
I2          BINARY             1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       TRND     1       0    -0.0370
      2  I1            UP      1       0    -8.9630
      3  I2            UP      1       0     8.0370

                                       ST  ERR   T-RATIO
                                        0.5764     -0.06
                                        5.2196     -1.72
                                        5.2195      1.54

RESIDUAL SUM OF SQUARES  =        2152.879639
                                (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                 80
RESIDUAL MEAN SQUARE     =          26.910995

PAGE  17     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS IGROUP1.
```

```
              MAXLAG IS 25./

NUMBER OF OBSERVATIONS             =              83
MEAN OF THE (DIFFERENCED) SERIES =            0.0000
STANDARD ERROR OF THE MEAN         =          0.5624
T-VALUE OF MEAN (AGAINST ZERO)     =          0.0000


AUTOCORRELATIONS

  1- 8      -.22 -.06  .04 -.09 -.10 -.08 -.19  .11
  ST.E       .11  .11  .12  .12  .12  .12  .12  .12

  9- 12     -.10  .11  .14 -.07
  ST.E       .12  .12  .12  .13

 13- 20      .07  .16 -.03 -.07 -.04  .04 -.07 -.11
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.10  .18 -.12  .09  .09
  ST.E       .13  .13  .14  .14  .14


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 -0.219                 XXXXXI    +
 2 -0.062                +   XXI     +
 3  0.044                +     IX    +
 4 -0.090                +   XXI     +
 5 -0.097                +   XXI     +
 6 -0.085                +   XXI     +
 7 -0.185                +XXXXXI     +
 8  0.111                +     IXXX  +
 9 -0.102                +  XXXI     +
10  0.112                +     IXXX  +
11  0.138                +     IXXX  +
12 -0.071                +   XXI     +
13  0.071                +     IXX   +
14  0.156                +     IXXXX +
15 -0.030                +    XI     +
16 -0.067                +   XXI     +
17 -0.039                +    XI     +
18  0.035                +     IX    +
19 -0.066                +   XXI     +
20 -0.107                +  XXXI     +
```

```
21 -0.099              +   XXI     +
22  0.177             +      IXXXX  +
23 -0.118             +   XXXI      +
24  0.085             +      IXX    +
25  0.089             +      IXX    +

PAGE  18     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  19     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  20     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  21     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  22     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
```

```
            TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1        I2        CLOSE
PAGE  23     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL=IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B  )
                                                1
I1         BINARY              1-  84  (1-B  )
                                                1
I2         BINARY              1-  84  (1-B  )
                                                1
CLOSE      BINARY              1-  84  (1-B  )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1   GROUP1      TRND     1      0      0.0875
      2   I1           UP      1      0     -9.0875
      3   I2           UP      1      0      7.9125
      4   CLOSE        UP      1      0    -10.0875

                                   ST  ERR   T-RATIO
                                    0.5702      0.15
                                    5.1288     -1.77
                                    5.1288      1.54
                                    5.1288     -1.97

RESIDUAL SUM OF SQUARES  =      2052.379395
DEGREES OF FREEDOM       =               79
RESIDUAL MEAN SQUARE     =        25.979477

PAGE  24     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS
```

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP1	TRND	1	0	0.0852	0.5699	0.15
2	I1	UP	1	0	-9.0853	5.1288	-1.77
3	I2	UP	1	0	7.9147	5.1288	1.54
4	CLOSE	UP	1	0	-10.0853	5.1288	-1.97

RESIDUAL SUM OF SQUARES = 2052.379883
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 25.979492

PAGE 25 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ACF VARIABLE IS IGROUP1.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 83
MEAN OF THE (DIFFERENCED) SERIES = 0.0022
STANDARD ERROR OF THE MEAN = 0.5491
T-VALUE OF MEAN (AGAINST ZERO) = 0.0040

AUTOCORRELATIONS

```
  1-  8    -.23 -.03  .04 -.05 -.13 -.07 -.17  .05
  ST.E      .11  .12  .12  .12  .12  .12  .12  .12

  9-  12   -.04  .10  .11 -.06
  ST.E      .12  .12  .12  .12

 13-  20    .07  .12 -.02 -.05 -.05  .01 -.09 -.06
  ST.E      .12  .12  .13  .13  .13  .13  .13  .13

 21-  25   -.14  .20 -.13  .14  .07
  ST.E      .13  .13  .13  .13  .14


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.230                X+XXXXI    +
 2 -0.031                +    XI     +
 3  0.041                +     IX    +
 4 -0.047                +    XI     +
 5 -0.132                +  XXXI     +
 6 -0.074                +   XXI     +
 7 -0.165                + XXXXI     +
 8  0.047                +     IX    +
 9 -0.044                +    XI     +
10  0.103                +     IXXX  +
11  0.114                +     IXXX  +
12 -0.060                +    XI     +
13  0.068                +     IXX   +
14  0.119                +     IXXX  +
15 -0.021                +    XI     +
16 -0.051                +    XI     +
17 -0.053                +    XI     +
18  0.011                +     I     +
19 -0.094                +   XXI     +
20 -0.065                +   XXI     +
21 -0.139                +  XXXI     +
22  0.204                +     IXXXXX+
23 -0.133               +   XXXI      +
24  0.139               +      IXXX   +
25  0.074               +      IXX    +

PAGE  26     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./
```

```
UNIVARIATE TIME SERIES MODEL ERASED
PAGE  27     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS              =              63
MEAN OF THE (DIFFERENCED) SERIES =          22.2540
STANDARD ERROR OF THE MEAN          =          1.0719
T-VALUE OF MEAN (AGAINST ZERO)      =         20.7611


AUTOCORRELATIONS

  1- 12      .62  .46  .33  .16  .12  0.0 -.11 -.14
  ST.E       .13  .17  .19  .20  .20  .20  .20  .20

  9- 12      .05  .21  .31  .31
  ST.E       .20  .20  .20  .21

 13- 24      .34  .30  .30  .25  .06 -.07 -.17 -.19
  ST.E       .22  .23  .23  .24  .24  .24  .24  .25

 21- 25     -.18 -.10 -.10 -.06  .02
  ST.E       .25  .25  .25  .25  .25


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.620              +     IXXXXX+XXXXXXXXXX
 2  0.461            +       IXXXXXXX+XXXX
 3  0.326           +        IXXXXXXXX+
 4  0.158          +         IXXXX     +
 5  0.117          +         IXXX      +
 6  0.002          +         I         +
 7 -0.108          +      XXXI         +
 8 -0.143          +     XXXXI         +
 9  0.050          +         IX        +
10  0.210          +         IXXXXX    +
11  0.307          +         IXXXXXXXX +
12  0.311          +         IXXXXXXXX +
13  0.336         +          IXXXXXXXX  +
14  0.301         +          IXXXXXXXX  +
15  0.302         +          IXXXXXXXX  +
16  0.252        +           IXXXXXX     +
```

```
17  0.056        +          IX          +
18 -0.073        +         XXI          +
19 -0.173        +       XXXXI          +
20 -0.194        +      XXXXXI          +
21 -0.177        +       XXXXI          +
22 -0.101        +        XXXI          +
23 -0.104        +        XXXI          +
24 -0.063        +         XXI          +
25  0.021        +          IX          +
```

```
PAGE  28     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  PACF        VARIABLE IS GROUP2.
              MAXLAG IS 25.
              TIME=1,63./

NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         22.2540
STANDARD ERROR OF THE MEAN         =          1.0719
T-VALUE OF MEAN (AGAINST ZERO)     =         20.7611


PARTIAL AUTOCORRELATIONS

  1-  8      .62  .12  0.0 -.13  .06 -.11 -.12 -.03
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      .37  .26  .10 -.10
  ST.E       .13  .13  .13  .13

 13- 20      .09 -.08  .01  .01 -.05 -.08 -.12 -.09
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.03  .10 -.05 -.07 -.08
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.620            +        IXXXXX+XXXXXXXXXX
 2  0.124            +        IXXX  +
 3 -0.001            +        I     +
 4 -0.126            +     XXXI     +
 5  0.056            +        IX    +
 6 -0.111            +     XXXI     +
 7 -0.124            +     XXXI     +
```

```
 8 -0.028              +    XI     +
 9  0.375              +     IXXXXX+XXX
10  0.258              +     IXXXXXX
11  0.104              +     IXXX  +
12 -0.096              +   XXI     +
13  0.086              +     IXX   +
14 -0.076              +   XXI     +
15  0.009              +     I     +
16  0.011              +     I     +
17 -0.048              +    XI     +
18 -0.079              +   XXI     +
19 -0.118              +  XXXI     +
20 -0.090              +   XXI     +
21 -0.029              +    XI     +
22  0.099              +     IXX   +
23 -0.053              +    XI     +
24 -0.074              +   XXI     +
25 -0.076              +   XXI     +
```

```
PAGE  29     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =             62
MEAN OF THE (DIFFERENCED) SERIES =         0.1935
STANDARD ERROR OF THE MEAN        =         0.9386
T-VALUE OF MEAN (AGAINST ZERO)    =         0.2062


AUTOCORRELATIONS

  1-  8     -.29 -.04  .04 -.18  .09 -.01 -.11 -.27
  ST.E       .13  .14  .14  .14  .14  .14  .14  .14

  9- 12      .02  .06  .16 -.03
  ST.E       .15  .15  .15  .15

 13- 20      .10 -.05  .06  .20 -.08 -.07 -.12 -.07
  ST.E       .15  .16  .16  .16  .16  .16  .16  .16

 21- 25     -.07  .10 -.03 -.04  .02
  ST.E       .16  .16  .16  .16  .17


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
```

```
     +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.287              X+XXXXXI     +
 2 -0.038              +     XI      +
 3  0.044              +      IX     +
 4 -0.177              +  XXXXI      +
 5  0.094              +      IXX    +
 6 -0.014              +      I      +
 7 -0.109              +   XXXI      +
 8 -0.272              XXXXXXXI      +
 9  0.015              +      I      +
10  0.058              +      IX     +
11  0.160              +      IXXXX  +
12 -0.029             +      XI       +
13  0.097             +       IXX     +
14 -0.045             +      XI       +
15  0.061             +       IXX     +
16  0.200             +       IXXXXX  +
17 -0.079             +     XXI       +
18 -0.067             +     XXI       +
19 -0.119             +    XXXI       +
20 -0.066             +     XXI       +
21 -0.071             +     XXI       +
22  0.104             +       IXXX    +
23 -0.035             +      XI       +
24 -0.038             +      XI       +
25  0.019             +       I       +

PAGE  30     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  PACF        VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./

NUMBER OF OBSERVATIONS             =              62
MEAN OF THE (DIFFERENCED) SERIES =           0.1935
STANDARD ERROR OF THE MEAN         =          0.9386
T-VALUE OF MEAN (AGAINST ZERO)     =          0.2062


PARTIAL AUTOCORRELATIONS

  1- 12     -.29 -.13 -.01 -.19 -.02 -.02 -.13 -.44
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.33 -.24 -.01 -.17
  ST.E       .13  .13  .13  .13
```

```
 13- 24     0.0 -.11 -.09 -.01  .02  0.0 -.01 -.05
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.15 -.04  .02  .06 -.01
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                                 I
 1 -0.287                  X+XXXXXI     +
 2 -0.131                   +  XXXI     +
 3 -0.006                   +     I     +
 4 -0.187                   +XXXXXI     +
 5 -0.015                   +     I     +
 6 -0.023                   +    XI     +
 7 -0.126                   +  XXXI     +
 8 -0.437               XXXXX+XXXXXI    +
 9 -0.332                  XX+XXXXXI    +
10 -0.241                   XXXXXXI     +
11 -0.013                   +     I     +
12 -0.173                   + XXXXI     +
13 -0.004                   +     I     +
14 -0.111                   +  XXXI     +
15 -0.093                   +   XXI     +
16 -0.006                   +     I     +
17  0.024                   +     IX    +
18  0.002                   +     I     +
19 -0.013                   +     I     +
20 -0.047                   +    XI     +
21 -0.151                   + XXXXI     +
22 -0.037                   +    XI     +
23  0.025                   +     IX    +
24  0.059                   +     IX    +
25 -0.009                   +     I     +

PAGE  31     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA       VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
```

PAGE 32 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

```
  ESTIMATION  RESIDUAL IS RGROUP2.
              TIME=1,63./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

```
VARIABLE  VAR TYPE  MEAN      TIME      DIFFERENCES
                                             1
GROUP2     RANDOM            1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.3700

                                    ST  ERR   T-RATIO
                                     0.1196      3.09

RESIDUAL SUM OF SQUARES  =      2990.223145
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =        49.020050
```

PAGE 33 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

```
VARIABLE  VAR TYPE  MEAN      TIME      DIFFERENCES
                                             1
GROUP2     RANDOM            1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1     0.3707
```

```
                                   ST  ERR   T-RATIO
                                    0.1194      3.10

RESIDUAL SUM OF SQUARES  =       2989.736084
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                 61
RESIDUAL MEAN SQUARE     =         49.012054

PAGE  34     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS RGROUP2.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =             63
MEAN OF THE (DIFFERENCED) SERIES =          0.2402
STANDARD ERROR OF THE MEAN        =          0.8744
T-VALUE OF MEAN (AGAINST ZERO)    =          0.2747


AUTOCORRELATIONS

  1-  8      .03 -.04 -.02 -.18  .01 -.09 -.26 -.38
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14

  9- 12     -.07  .11  .20  .08
  ST.E       .15  .15  .16  .16

 13- 20      .14  .06  .15  .23 -.06 -.15 -.20 -.16
  ST.E       .16  .16  .16  .17  .17  .17  .17  .18

 21- 25     -.10  .05 -.03 -.03  .06
  ST.E       .18  .18  .18  .18  .18


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.026              +     IX    +
 2 -0.036              +    XI     +
 3 -0.020              +     I     +
 4 -0.178              + XXXXI     +
 5  0.009              +     I     +
 6 -0.093              +   XXI     +
 7 -0.257              XXXXXXI     +
 8 -0.377           XX+XXXXXXI      +
 9 -0.067            +     XXI       +
```

```
10  0.112            +       IXXX    +
11  0.202            +       IXXXXX  +
12  0.080            +       IXX     +
13  0.139            +       IXXX    +
14  0.058            +       IX      +
15  0.146            +       IXXXX   +
16  0.232            +       IXXXXXX +
17 -0.065            +     XXI       +
18 -0.149            +   XXXXI       +
19 -0.202            +  XXXXXI       +
20 -0.165           +    XXXXI        +
21 -0.102           +     XXXI        +
22  0.054           +        IX       +
23 -0.033           +       XI        +
24 -0.030           +       XI        +
25  0.063           +        IXX      +

PAGE  35     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  36     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  37     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  38     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
```

```
             TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1        I2
PAGE  39      ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL=IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP2     RANDOM              1-  84  (1-B  )
                                                1
I1         BINARY              1-  84  (1-B  )
                                                1
I2         BINARY              1-  84  (1-B  )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2        MA      1       1      0.5147
      2  I1            UP      1       0      3.3736
      3  I2            UP      1       0      1.0016

                                 ST  ERR   T-RATIO
                                  0.0982      5.24
                                  6.1793      0.55
                                  6.2468      0.16

RESIDUAL SUM OF SQUARES   =       4141.902344
DEGREES OF FREEDOM        =                80
RESIDUAL MEAN SQUARE      =         51.773773

PAGE  40      ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04
```

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	MA	1	1	0.5158	0.0980	5.26
2	I1	UP	1	0	3.3678	6.1704	0.55
3	I2	UP	1	0	0.9952	6.2375	0.16

RESIDUAL SUM OF SQUARES = 4141.015625
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 51.762695

PAGE 41 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ACF VARIABLE IS IGROUP2.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0375
STANDARD ERROR OF THE MEAN = 0.7707
T-VALUE OF MEAN (AGAINST ZERO) = 0.0486

AUTOCORRELATIONS

1- 8	.06	-.06	.02	-.12	-.05	-.18	-.19	-.28
ST.E	.11	.11	.11	.11	.11	.11	.12	.12
9- 12	-.18	.08	.25	.13				
ST.E	.13	.13	.13	.14				
13- 20	.09	.17	.24	.09	-.07	-.12	-.22	-.13
ST.E	.14	.14	.14	.14	.15	.15	.15	.15

```
 21- 25    -.13 -.01  .01 -.05  .09
  ST.E       .15  .15  .15  .15  .15


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.062                 +    IXX  +
 2 -0.063                 +  XXI    +
 3  0.016                 +    I    +
 4 -0.120                 + XXXI    +
 5 -0.045                 +   XI    +
 6 -0.184                 XXXXXI    +
 7 -0.193                +XXXXXI     +
 8 -0.277               X+XXXXXI     +
 9 -0.178                + XXXXI     +
10  0.080                +     IXX   +
11  0.253                +     IXXXXXX
12  0.125               +      IXXX   +
13  0.086               +      IXX    +
14  0.165               +      IXXXX  +
15  0.237               +      IXXXXXX+
16  0.087               +      IXX    +
17 -0.073               +    XXI      +
18 -0.116               +   XXXI      +
19 -0.223               +XXXXXXI      +
20 -0.128               +   XXXI      +
21 -0.126               +   XXXI      +
22 -0.014              +       I       +
23  0.006              +       I       +
24 -0.055              +      XI       +
25  0.087              +       IXX     +

PAGE  42     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  43     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA       VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
```

```
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  44     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  45     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2
PAGE  46     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2       CLOSE
PAGE  47     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL=IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

MAXIMUM NO  OF ITERATION   6 REACHED

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1        I2       CLOSE
```

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	MA	1	1	0.5321	0.0991	5.37
2	I1	UP	1	0	4.3789	6.2177	0.70
3	I2	UP	1	0	0.8738	6.1759	0.14
4	CLOSE	UP	1	0	-6.5589	6.2192	-1.05

RESIDUAL SUM OF SQUARES = 4084.535400
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 51.702972

PAGE 48 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.5342
2	I1	UP	1	0	4.3942
3	I2	UP	1	0	0.8620
4	CLOSE	UP	1	0	-6.5567

ST ERR	T-RATIO
0.0987	5.41
6.2032	0.71
6.1598	0.14
6.2063	-1.06

RESIDUAL SUM OF SQUARES = 4083.589844
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 51.691010

PAGE 49 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ACF VARIABLE IS IGROUP2.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.1889
STANDARD ERROR OF THE MEAN = 0.7651
T-VALUE OF MEAN (AGAINST ZERO) = 0.2469

AUTOCORRELATIONS

1- 8	.07	-.06	0.0	-.14	-.05	-.18	-.21	-.27
ST.E	.11	.11	.11	.11	.11	.11	.12	.12
9- 12	-.16	.07	.23	.14				
ST.E	.13	.13	.13	.13				
13- 20	.09	.19	.21	.04	-.08	-.12	-.20	-.12
ST.E	.14	.14	.14	.14	.14	.15	.15	.15
21- 25	-.11	-.02	.02	-.03	.10			
ST.E	.15	.15	.15	.15	.15			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
```

```
 1  0.071              +    IXX  +
 2 -0.061              +  XXI    +
 3  0.001              +    I    +
 4 -0.138              + XXXI    +
 5 -0.045              +   XI    +
 6 -0.175             + XXXXI     +
 7 -0.213             +XXXXXI     +
 8 -0.271            X+XXXXXI     +
 9 -0.161             + XXXXI     +
10  0.072             +     IXX   +
11  0.233             +     IXXXXXX
12  0.138            +      IXXX   +
13  0.094            +      IXX    +
14  0.191            +      IXXXXX +
15  0.214            +      IXXXXX +
16  0.042            +      IX     +
17 -0.082            +    XXI      +
18 -0.124            +   XXXI      +
19 -0.203            + XXXXXI      +
20 -0.117            +   XXXI      +
21 -0.110            +   XXXI      +
22 -0.019            +      I      +
23  0.017            +      I      +
24 -0.032            +     XI      +
25  0.100            +      IXXX   +

PAGE  50     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  51     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =       12.4127
STANDARD ERROR OF THE MEAN        =        0.6036
T-VALUE OF MEAN (AGAINST ZERO)    =       20.5632


AUTOCORRELATIONS

  1-  8      .26  .05 -.03 -.12 -.08  0.0 -.09 -.26
  ST.E       .13  .13  .13  .13  .14  .14  .14  .14

  9- 12     -.04 -.11 -.13 -.06
  ST.E       .15  .15  .15  .15
```

```
 13- 20     .07  .08  .12  .07 -.07  .04  .09  0.0
  ST.E      .15  .15  .15  .15  .15  .15  .15  .15

 21- 25    -.02 -.15 -.21 -.17 -.03
  ST.E      .15  .15  .16  .16  .16
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.265              +     IXXXXX+X
 2  0.050             +      IX     +
 3 -0.025             +     XI      +
 4 -0.124             +   XXXI      +
 5 -0.076             +    XXI      +
 6 -0.001             +      I      +
 7 -0.088             +    XXI      +
 8 -0.260             +XXXXXXI      +
 9 -0.039             +     XI      +
10 -0.108             +   XXXI      +
11 -0.132             +   XXXI      +
12 -0.057             +     XI      +
13  0.070             +      IXX    +
14  0.084             +      IXX    +
15  0.122             +      IXXX   +
16  0.067             +      IXX    +
17 -0.075             +    XXI      +
18  0.039            +       IX      +
19  0.087            +       IXX     +
20  0.001            +       I       +
21 -0.023            +      XI       +
22 -0.146            +   XXXXI       +
23 -0.213            +  XXXXXI       +
24 -0.168            +   XXXXI       +
25 -0.032            +      XI       +
```

PAGE 52   ANALYSES FOR ALCOHOL & DRUG READMISSIONS

```
  PACF         VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =          63
MEAN OF THE (DIFFERENCED) SERIES  =     12.4127
STANDARD ERROR OF THE MEAN        =      0.6036
T-VALUE OF MEAN (AGAINST ZERO)    =     20.5632
```

```
PARTIAL AUTOCORRELATIONS

  1-  8     .26 -.02 -.04 -.12 -.01  .03 -.11 -.25
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     .09 -.13 -.13 -.07
  ST.E      .13  .13  .13  .13

 13- 20     .10  .03  .01 -.06 -.05  .05  .03 -.08
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     0.0 -.15 -.12 -.12  .01
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.265               +    IXXXXX+X
 2 -0.022               +   XI     +
 3 -0.036               +   XI     +
 4 -0.115               + XXXI     +
 5 -0.014               +    I     +
 6  0.029               +    IX    +
 7 -0.107               + XXXI     +
 8 -0.250               XXXXXXI    +
 9  0.093               +    IXX   +
10 -0.125               + XXXI     +
11 -0.127               + XXXI     +
12 -0.075               +  XXI     +
13  0.104               +    IXXX  +
14  0.027               +    IX    +
15  0.007               +    I     +
16 -0.062               +  XXI     +
17 -0.052               +   XI     +
18  0.051               +    IX    +
19  0.030               +    IX    +
20 -0.078               +  XXI     +
21 -0.005               +    I     +
22 -0.150               + XXXXI    +
23 -0.121               + XXXI     +
24 -0.119               + XXXI     +
25  0.005               +    I     +
```

PAGE 53 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ARIMA VARIABLE IS GROUP3.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT VARIABLE = NOISE
PAGE 54 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION RESIDUAL IS RGROUP3.
TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	12.4127	0.6036	20.56

RESIDUAL SUM OF SQUARES = 1423.262695
DEGREES OF FREEDOM = 62
RESIDUAL MEAN SQUARE = 22.955841

PAGE 55 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	

```
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP3       MEAN    1       0    12.4127

                                ST  ERR   T-RATIO
                                 0.6036     20.56

RESIDUAL SUM OF SQUARES  =       1423.262695
                           (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                62
RESIDUAL MEAN SQUARE     =         22.955841

PAGE  56     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS RGROUP3.
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =        0.0000
STANDARD ERROR OF THE MEAN        =        0.6036
T-VALUE OF MEAN (AGAINST ZERO)    =        0.0000


AUTOCORRELATIONS

  1-  8      .26  .05 -.03 -.12 -.08  0.0 -.09 -.26
  ST.E       .13  .13  .13  .13  .14  .14  .14  .14

  9- 12     -.04 -.11 -.13 -.06
  ST.E       .15  .15  .15  .15

 13- 20      .07  .08  .12  .07 -.07  .04  .09  0.0
  ST.E       .15  .15  .15  .15  .15  .15  .15  .15

 21- 25     -.02 -.15 -.21 -.17 -.03
  ST.E       .15  .15  .16  .16  .16


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.265               +      IXXXXX+X
 2  0.050              +       IX     +
 3 -0.025              +      XI      +
 4 -0.124              +    XXXI      +
 5 -0.076              +     XXI      +
 6 -0.001              +       I      +
```

```
 7 -0.088            +    XXI       +
 8 -0.260            +XXXXXXI       +
 9 -0.039            +      XI      +
10 -0.108            +    XXXI      +
11 -0.132            +    XXXI      +
12 -0.057            +      XI      +
13  0.070            +       IXX    +
14  0.084            +       IXX    +
15  0.122            +       IXXX   +
16  0.067            +       IXX    +
17 -0.075            +    XXI       +
18  0.039           +        IX      +
19  0.087           +        IXX     +
20  0.001           +        I       +
21 -0.023           +       XI       +
22 -0.146           +   XXXXI        +
23 -0.213           +  XXXXXI        +
24 -0.168           +   XXXXI        +
25 -0.032           +       XI       +

PAGE  57     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  58     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA       VARIABLE IS GROUP3.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  59     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  60     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
```

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT VARIABLE = NOISE I1 I2
PAGE 61 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION RESIDUAL=IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	12.4127	0.5690	21.81
2	I1	UP	1	0	-2.8570	1.6095	-1.78
3	I2	UP	1	0	-2.4726	1.9917	-1.24

RESIDUAL SUM OF SQUARES = 1652.395508
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 20.399933

PAGE 62 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	12.4127	0.5691	21.81
2	I1	UP	1	0	-2.8568	1.6095	-1.77
3	I2	UP	1	0	-2.4731	1.9917	-1.24

RESIDUAL SUM OF SQUARES = 1652.396240
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 20.399948

PAGE 63 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.4868
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

1- 8	.27	.05	-.06	-.14	-.07	-.01	-.08	-.22
ST.E	.11	.12	.12	.12	.12	.12	.12	.12
9- 12	-.03	-.09	-.13	-.03				
ST.E	.13	.13	.13	.13				
13- 20	.07	.10	.11	.08	-.08	-.03	-.01	-.07
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	-.02	-.08	-.11	-.11	.03			

```
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.272                +    IXXXX+XX
 2  0.048               +     IX     +
 3 -0.057               +    XI      +
 4 -0.143               + XXXXI      +
 5 -0.069               +   XXI      +
 6 -0.007               +     I      +
 7 -0.075               +   XXI      +
 8 -0.222               XXXXXXI      +
 9 -0.029               +    XI      +
10 -0.087               +   XXI      +
11 -0.126               +  XXXI      +
12 -0.030               +    XI      +
13  0.068               +     IXX    +
14  0.099               +     IXX    +
15  0.106               +     IXXX   +
16  0.082               +     IXX    +
17 -0.078               +   XXI      +
18 -0.029               +    XI      +
19 -0.012               +     I      +
20 -0.071               +   XXI      +
21 -0.023               +    XI      +
22 -0.081               +   XXI      +
23 -0.113               +  XXXI      +
24 -0.114              +   XXXI       +
25  0.027              +      IX      +

PAGE  64     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  65     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ARIMA        VARIABLE IS GROUP3.CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  66     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS
```

```
  INDEP       VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  67     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  68     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  INDEP       VARIABLE IS CLOSE.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2        CLOSE
PAGE  69     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ESTIMATION  RESIDUAL=IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP3     RANDOM            1-  84

I1         BINARY            1-  84
```

I2	BINARY	1- 84	
CLOSE	BINARY	1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	12.7667	0.5580	22.88
2	I1	UP	1	0	4.2233	2.8814	1.47
3	I2	UP	1	0	-2.4731	1.9060	-1.30
4	CLOSE	UP	1	0	-7.4340	2.5571	-2.91

RESIDUAL SUM OF SQUARES = 1494.528320
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 18.681595

PAGE 70 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	12.7667
2	I1	UP	1	0	4.2251
3	I2	UP	1	0	-2.4742
4	CLOSE	UP	1	0	-7.4350

```
                                        ST  ERR   T-RATIO
                                         0.5580    22.88
                                         2.8815     1.47
                                         1.9062    -1.30
                                         2.5571    -2.91

RESIDUAL SUM OF SQUARES   =       1494.526855
                                (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =                   80
RESIDUAL MEAN SQUARE      =         18.681580

PAGE  71     ANALYSES FOR ALCOHOL & DRUG  READMISSIONS

  ACF          VARIABLE IS IGROUP3.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS            =              84
MEAN OF THE (DIFFERENCED) SERIES =           0.0000
STANDARD ERROR OF THE MEAN        =           0.4630
T-VALUE OF MEAN (AGAINST ZERO)    =           0.0000


AUTOCORRELATIONS

  1-  8       .23  .06 -.01 -.09 -.05  .03 -.09 -.24
  ST.E        .11  .11  .12  .12  .12  .12  .12  .12

  9- 12      -.06 -.10 -.20 -.10
  ST.E        .12  .12  .12  .13

 13- 20      -.02  .04  .09  .11 -.01  .05  .13  .03
  ST.E        .13  .13  .13  .13  .13  .13  .13  .13

 21- 25       .08 -.03 -.06 -.05  .04
  ST.E        .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1  0.228                +     IXXXX+X
 2  0.064               +      IXX   +
 3 -0.014               +      I     +
 4 -0.093               +    XXI     +
 5 -0.053               +     XI     +
 6  0.029               +      IX    +
 7 -0.086               +    XXI     +
```

```
 8 -0.239           XXXXXXI     +
 9 -0.061           +   XXI     +
10 -0.102           +  XXXI     +
11 -0.196           +XXXXXI     +
12 -0.104           +  XXXI     +
13 -0.018           +     I     +
14  0.040           +     IX    +
15  0.092           +     IXX   +
16  0.110           +     IXXX  +
17 -0.011           +     I     +
18  0.051           +     IX    +
19  0.126           +     IXXX  +
20  0.029           +     IX    +
21  0.077           +     IXX   +
22 -0.026          +     XI      +
23 -0.055          +     XI      +
24 -0.051          +     XI      +
25  0.037          +      IX     +
```

PAGE 72 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

END/

NUMBER OF INTEGER WORDS OF STORAGE USED IN
PRECEDING PROBLEM 4708
CPU TIME USED 7.833 SECONDS
PAGE 73 ANALYSES FOR ALCOHOL & DRUG READMISSIONS

BMDP2T - BOX-JENKINS TIME SERIES PROGRAM
JULY 19, 1982 AT 11:55:57

PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED

YRC Admissions

```
//L84SAL JOB (3084,028A,,10),'LUEGER',TIME=(0,30),CLASS=6
/*JOBPARM Q=FETCH,I
//STEP1  EXEC  BIMED,PROG=BMDP2T
//FT06F001 DD DSN=&&TEMP1,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD *
/ PRINT        PAGESIZE=0.
/ PROBLEM      TITLE IS 'INTERVENTION ANALYSES
               OF YRC  ADMISSIONS'.
/ INPUT        VARIABLES ARE 6.
               FORMAT IS '(6F2.0)'.
/ VARIABLE     NAMES ARE GROUP1, GROUP2, GROUP3,
               I1, I2,CLOSE, TOTAL.
               ADD = 1.
/ TRANSFORM    TOTAL = GROUP1 + GROUP2 + GROUP3.
/ SAVE         NEW. UNIT=4. CODE=TEMP.
/ END
 510 7 0 0 0
 7 4 3 0 0 0
12 2 1 0 0 0
 714 2 0 0 0
 610 1 0 0 0
12 9 2 0 0 0
11 6 2 0 0 0
 711 5 0 0 0
13 4 7 0 0 0
17 7 4 0 0 0
 610 1 0 0 0
 710 2 0 0 0
1510 3 0 0 0
 612 4 0 0 0
 613 2 0 0 0
 8 6 5 0 0 0
 9 7 2 0 0 0
 710 0 0 0 0
1715 1 0 0 0
19 4 4 0 0 0
1310 2 0 0 0
1012 0 0 0 0
14 5 1 0 0 0
 6 9 1 0 0 0
10 9 2 0 0 0
 512 4 0 0 0
17 8 5 0 0 0
1010 3 0 0 0
 6 9 5 0 0 0
 811 1 0 0 0
```

11	16	4	0	0	0
10	8	4	0	0	0
12	12	3	0	0	0
2	5	4	0	0	0
11	10	1	0	0	0
9	7	4	0	0	0
9	12	2	0	0	0
6	7	2	0	0	0
16	12	2	0	0	0
11	11	1	0	0	0
5	5	1	0	0	0
7	7	2	0	0	0
3	11	3	0	0	0
7	10	1	0	0	0
12	8	4	0	0	0
8	10	2	0	0	0
7	10	1	0	0	0
10	4	0	0	0	0
6	8	4	0	0	0
8	3	3	0	0	0
6	11	0	0	0	0
4	5	4	0	0	0
4	5	0	0	0	0
5	8	0	0	0	0
4	7	0	0	0	0
1	4	1	0	0	0
5	6	1	0	0	0
7	3	2	0	0	0
6	6	3	0	0	0
5	3	1	0	0	0
4	2	2	0	0	1
5	6	2	0	0	1
5	8	1	0	0	1
5	9	3	1	0	1
2	6	1	1	0	1
1	5	1	1	0	1
3	2	3	1	0	1
3	12	3	1	0	1
3	5	4	1	0	1
3	8	2	1	0	1
7	6	3	1	0	1
4	4	1	1	0	1
8	7	1	1	0	1
6	4	2	1	0	1
6	5	3	1	0	1
4	4	5	1	1	1
6	4	1	1	1	1
10	4	1	1	1	1
4	3	3	1	1	1
4	9	0	1	1	1

```
6 7 2 1 1 1
6 6 2 1 1 1
8 5 1 1 1 1
5 0 0 1 1 1
/ END
 TPLOT         VARIABLES ARE GROUP1, GROUP2, GROUP3.
               COMMON./
 ACF           VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
 PACF          VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
 ACF           VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./
 PACF          VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./
 ARIMA         VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./
 ESTIMATION    RESIDUAL IS RGROUP1.
               TIME=1,63./
 ACF           VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./
 ERASE         MODEL./
 ARIMA         VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAORDER IS '(1)'./
 INDEP         VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
 INDEP         VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
 ESTIMATION    RESIDUAL=IGROUP1./
 ACF           VARIABLE IS IGROUP1.
               MAXLAG IS 25./
 ERASE         MODEL./
 ACF           VARIABLE IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./
 PACF          VARIABLE IS GROUP2.
               MAXLAG IS 25.
```

```
              TIME=1,63./
ACF           VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
PACF          VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
ARIMA         VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./
ESTIMATION    RESIDUAL IS RGROUP2.
              TIME=1,63./
ACF           VARIABLE IS RGROUP2.
              MAXLAG IS 25.
              TIME=1,63./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP2.
              DFORDER IS 1.
              MAORDER IS '(1)'./
INDEP         VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
INDEP         VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./
ESTIMATION    RESIDUAL=IGROUP2./
ACF           VARIABLE IS IGROUP2.
              MAXLAG IS 25./
ERASE         MODEL./
ACF           VARIABLE IS GROUP3.
              MAXLAG IS 25.
              TIME=1,63./
PACF          VARIABLE IS GROUP3.
              MAXLAG IS 25.
              TIME=1,63./
ARIMA         VARIABLE IS GROUP3.
              CONSTANT./
ESTIMATION    RESIDUAL IS RGROUP3.
              TIME=1,63./
ACF           VARIABLE IS RGROUP3.
              MAXLAG IS 25.
              TIME=1,63./
ERASE         MODEL./
ARIMA         VARIABLE IS GROUP3.
              CONSTANT./
INDEP         VARIABLE IS I1.
```

```
                UPORDER IS '(0)'.
                TYPE IS BINARY./
  INDEP         VARIABLE IS I2.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
  ESTIMATION    RESIDUAL=IGROUP3./
  ACF           VARIABLE IS IGROUP3.
                MAXLAG IS 25./
  ERASE         MODEL./
  ARIMA         VARIABLE IS GROUP3.
                CONSTANT./
  INDEP         VARIABLE IS I1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
  INDEP         VARIABLE IS I2.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
  INDEP         VARIABLE IS CLOSE.
                UPORDER IS '(0)'.
                TYPE IS BINARY./
  ESTIMATION    RESIDUAL=IGROUP3./
  ACF           VARIABLE IS IGROUP3.
                MAXLAG IS 25./
   END /
//STEP2  EXEC SAS,OPTIONS='NOSOURCE'
//IN     DD DSN=&&TEMP1,DISP=(OLD,DELETE)
//OUT    DD DSN=&&TEMP2,UNIT=SYSDA,SPACE=(TRK,(1,5),RLSE),
//  DCB=(RECFM=FB,LRECL=133,BLKSIZE=931),DISP=(,PASS)
//SYSIN DD DSN=L84SAL.SAS.CNTL(FIGURES),DISP=SHR
//STEP3 EXEC IEBGENER
//SYSUT1 DD DSN=&&TEMP2,DISP=(OLD,DELETE)
//SYSUT2 DD DSN=L84SAL.YRC,DCB=(RECFM=FB,LRECL=133,
    BLKSIZE=931),
//  DISP=(,CATLG,DELETE),SPACE=(TRK,(2,5),RLSE),UNIT=SYSTS,
//  LABEL=RETPD=120,VOL=SER=LD5010
//SYSIN  DD DUMMY //
```

```
PAGE   1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
    JULY 19, 1982  AT 11:57:32

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
```

```
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'INTERVENTION ANALYSES OF
                YRC ADMISSIONS'.
/ INPUT         VARIABLES ARE 6.
                FORMAT IS '(6F2.0)'.
/ VARIABLE      NAMES ARE GROUP1, GROUP2, GROUP3,
                I1, I2, CLOSE, TOTAL.
                ADD = 1.
/ TRANSFORM     TOTAL = GROUP1 + GROUP2 + GROUP3.
/ SAVE          NEW. UNIT=4. CODE=TEMP.
/ END
PROBLEM TITLE IS
INTERVENTION ANALYSES OF YRC ADMISSIONS

NUMBER OF VARIABLES TO READ IN                          6
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS            1
TOTAL NUMBER OF VARIABLES                               7
NUMBER OF CASES TO READ IN                         TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS      NEITHER
BLANKS ARE                                        MISSING
INPUT UNIT NUMBER                                       5
REWIND INPUT UNIT PRIOR TO READING    DATA             NO
NUMBER OF WORDS OF DYNAMIC STORAGE                  45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT               1

***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 GROUP1      2 GROUP2      3 GROUP3
     4 I1          5 I2          6 CLOSE
     7 TOTAL
INPUT FORMAT IS
(6F2.0)
MAXIMUM LENGTH DATA RECORD IS   12 CHARACTERS
I N P U T   V A R I A B L E S
   VARIABLE     RECORD   COLUMNS     FIELD  TYPE
 INDEX   NAME     NO    BEGIN  END   WIDTH
 ----- --------  ----  ----- -----  -----  ----
     1 GROUP1      1       1     2     2     F
     2 GROUP2      1       3     4     2     F
     3 GROUP3      1       5     6     2     F
     4 I1          1       7     8     2     F
     5 I2          1       9    10     2     F
     6 CLOSE       1      11    12     2     F
```

```
------------------------------------------
BMDP FILE IS BEING WRITTEN ON UNIT       4
CODE.     IS      TEMP
CONTENT   IS      DATA
LABEL     IS
     JULY 19, 1982      11:57:32
VARIABLES ARE
     1 GROUP1       2 GROUP2       3 GROUP3
     4 I1           5 I2           6 CLOSE
     7 TOTAL
BASED ON INPUT FORMAT SUPPLIED
1 RECORDS READ PER CASE

NUMBER OF CASES READ             84


BMDP   FILE ON UNIT  4 HAS BEEN COMPLETED
------------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE   2     INTERVENTION ANALYSES OF YRC ADMISSIONS



  TPLOT         VARIABLES ARE GROUP1, GROUP2, GROUP3.
                COMMON./



SYMBOL FOR VARIABLE GROUP1    IS    A
SYMBOL FOR VARIABLE GROUP2    IS    B
SYMBOL FOR VARIABLE GROUP3    IS    C

        2.50      7.50      12.5      17.5      22.5
   0.00      5.00      10.0      15.0      20.0
     .+----+----+----+----+----+----+----+----+----+-
     I          A   C     B
     I      C B      A
     I  C B                   A
     I    C          A            B
   5 +  C          A      B
     I    C             B     A
     I    C        B        A
     I          C   A       B
     I        B     C         A
  10 +        C     B                 A
     I  C          A      B
     I    C          A    B
     I      C             B         A
```

```
   I        C   A           B
15 +    C       A             B
   I          C B   A
   I    C         B   A
   IC             A     B
   I  C                           B   A
20 +        *                             A
   I    C               B     A
   IC                   A   B
   I  C       B                 A
   I  C         A     B
25 +    C             B A
   I        C A             B
   I          C     B                 A
   I      C             *
   I          C A     B
30 +  C             A     B
   I        C             A         B
   I        C       B   A
   I      C                 *
   I    A   C B
35 +  C                 B A
   I        C     B   A
   I    C             A     B
   I    C       A B
   I    C                   B       A
40 +  C                   *
   I  C       *
   I    C         *
   I      *               B
   I  C           A     B
45 +        C       B       A
   I    C           A   B
   I  C           A     B
   IC       B           A
   I        C   A   B
50 +      *         A
   IC           A         B
   I        * B
   IC       A B
   IC         A     B
55 +C       A     B
   I  *     B
   I  C       A B
   I    C B       A
   I      C     *
60 +  C   B   A
   I    *   A
   I    C     A B
   I  C       A     B
```

```
    I   C A   B
 65 + CA   B
    I *   B
    I  B*
    I   *        B
    I   ACB
 70 +  CA    B
    I   C  BA
    I C  *
    I C     BA
    I  C B A
 75 +   C BA
    I    *C
    I C  B A
    I C  B     A
    I   *A
 80 +C   A    B
    I  C   AB
    I  C   *
    I C   B  A
    I*    A
```

PAGE 3 INTERVENTION ANALYSES OF YRC ADMISSIONS

```
  ACF          VARIABLE IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
```

```
NUMBER OF OBSERVATIONS              =         63
MEAN OF THE (DIFFERENCED) SERIES    =     8.3651
STANDARD ERROR OF THE MEAN          =     0.4990
T-VALUE OF MEAN (AGAINST ZERO)      =    16.7637
```

AUTOCORRELATIONS

1- 8	.25	.11	.28	.24	-.05	.20	.21	.14
ST.E	.13	.13	.13	.14	.15	.15	.15	.16
9- 12	.09	.27	.03	.17				
ST.E	.16	.16	.17	.17				
13- 20	.14	.08	-.06	-.06	.08	.07	.02	.07
ST.E	.17	.17	.17	.17	.17	.18	.18	.18
21- 25	-.10	-.08	-.08	-.15	-.03			
ST.E	.18	.18	.18	.18	.18			

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.249               +    IXXXXXX
 2  0.108              +     IXXX   +
 3  0.279              +     IXXXXXXX
 4  0.245              +     IXXXXXX+
 5 -0.054              +    XI      +
 6  0.199              +     IXXXXX +
 7  0.206             +      IXXXXX  +
 8  0.141             +      IXXXX   +
 9  0.089             +      IXX     +
10  0.267             +      IXXXXXXX+
11  0.033             +      IX      +
12  0.174             +      IXXXX   +
13  0.139             +      IXXX    +
14  0.079             +      IXX     +
15 -0.061            +     XXI        +
16 -0.063            +     XXI        +
17  0.084            +       IXX      +
18  0.074            +       IXX      +
19  0.019            +       I        +
20  0.066            +       IXX      +
21 -0.099            +     XXI        +
22 -0.075            +     XXI        +
23 -0.081            +     XXI        +
24 -0.152            +   XXXXI        +
25 -0.035            +      XI        +
```



```
  PACF          VARIABLE IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =          8.3651
STANDARD ERROR OF THE MEAN         =          0.4990
T-VALUE OF MEAN (AGAINST ZERO)     =         16.7637


PARTIAL AUTOCORRELATIONS

  1-  8      .25   .05   .26   .14 -.18   .20   .05   .11
```

```
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      0.0  .13 -.11  .18
  ST.E       .13  .13  .13  .13

 13- 20     -.04 -.03 -.12 -.24  .22 -.02  .09 -.10
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.25  .01 -.04 -.09  .13
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.249               +     IXXXXXX
 2  0.049               +     IX    +
 3  0.258               +     IXXXXXX
 4  0.136               +     IXXX  +
 5 -0.182               +XXXXXI     +
 6  0.201               +     IXXXXX+
 7  0.050               +     IX    +
 8  0.115               +     IXXX  +
 9  0.004               +     I     +
10  0.129               +     IXXX  +
11 -0.113               +  XXXI     +
12  0.181               +     IXXXXX+
13 -0.037               +    XI     +
14 -0.029               +    XI     +
15 -0.118               +  XXXI     +
16 -0.240               XXXXXXI     +
17  0.215               +     IXXXXX+
18 -0.020               +     I     +
19  0.089               +     IXX   +
20 -0.099               +   XXI     +
21 -0.246               XXXXXXI     +
22  0.006               +     I     +
23 -0.045               +    XI     +
24 -0.094               +   XXI     +
25  0.128               +     IXXX  +
PAGE    5     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ACF           VARIABLE IS GROUP1.
                DFORDER IS 1.
```

```
               MAXLAG IS 25.
               TIME=1,63./

NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =          0.0
STANDARD ERROR OF THE MEAN          =          0.6166
T-VALUE OF MEAN (AGAINST ZERO)      =          0.0

AUTOCORRELATIONS

  1-  8     -.41 -.20  .13  .18 -.36  .16  .03  .01
  ST.E       .13  .15  .15  .15  .16  .17  .17  .17

  9- 12     -.14  .25 -.25  .14
  ST.E       .17  .17  .18  .18

 13- 20      0.0  .05 -.08 -.11  .10  .06 -.08  .12
  ST.E       .19  .19  .19  .19  .19  .19  .19  .19

 21- 25     -.13  .02  .04 -.11  0.0
  ST.E       .19  .19  .19  .19  .19

PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.408          XXXX+XXXXXI     +
 2 -0.202             + XXXXXI      +
 3  0.130             +     IXXX    +
 4  0.179             +     IXXXX   +
 5 -0.357           X+XXXXXXXI       +
 6  0.159            +      IXXXX    +
 7  0.030            +      IX       +
 8  0.013            +      I        +
 9 -0.144            +   XXXXI       +
10  0.250            +      IXXXXXXX +
11 -0.251           +  XXXXXXI        +
12  0.143           +       IXXXX     +
13  0.0             +       I         +
14  0.050           +       IX        +
15 -0.080           +     XXI         +
16 -0.105           +    XXXI         +
17  0.104           +       IXXX      +
18  0.063           +       IXX       +
19 -0.076           +     XXI         +
```

```
20  0.120          +         IXXX     +
21 -0.126          +      XXXI        +
22  0.024          +         IX       +
23  0.040          +         IX       +
24 -0.107          +      XXXI        +
25  0.002          +         I        +
PAGE   6     INTERVENTION ANALYSES OF YRC ADMISSIONS



  PACF          VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =           0.0
STANDARD ERROR OF THE MEAN          =        0.6166
T-VALUE OF MEAN (AGAINST ZERO)      =        0.0


PARTIAL AUTOCORRELATIONS

  1-  8      -.41 -.44 -.25  .08 -.28 -.10 -.17 -.04
  ST.E        .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      -.14  .09 -.20  .03
  ST.E        .13  .13  .13  .13

 13- 20       .01  .11  .21 -.26  0.0 -.05  .16  .28
  ST.E        .13  .13  .13  .13  .13  .13  .13  .13

 21- 25      -.03 -.02  .06 -.09 -.05
  ST.E        .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                               I
 1 -0.408         XXXX+XXXXXI     +
 2 -0.442        XXXXX+XXXXXI     +
 3 -0.252             XXXXXXI     +
 4  0.076             +     IXX   +
 5 -0.278            X+XXXXXI     +
 6 -0.102             +  XXXI     +
```

```
 7 -0.173           + XXXXI     +
 8 -0.039           +    XI     +
 9 -0.137           +  XXXI     +
10  0.094           +     IXX   +
11 -0.204           +XXXXXI     +
12  0.027           +     IX    +
13  0.014           +     I     +
14  0.107           +     IXXX  +
15  0.209           +     IXXXXX+
16 -0.259           XXXXXXI     +
17  0.004           +     I     +
18 -0.050           +    XI     +
19  0.158           +     IXXXX +
20  0.282           +     IXXXXX+X
21 -0.026           +    XI     +
22 -0.019           +     I     +
23  0.064           +     IXX   +
24 -0.090           +   XXI     +
25 -0.048           +    XI     +
PAGE   7     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ARIMA         VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE   8     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ESTIMATION    RESIDUAL IS RGROUP1.
                TIME=1,63./


ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04
```

```
SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE   VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1     0.8043

                                    ST  ERR   T-RATIO
                                     0.0745    10.79

RESIDUAL SUM OF SQUARES  =       898.409912
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =        14.728031
PAGE   9     INTERVENTION ANALYSES OF YRC ADMISSIONS


ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE   VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP1     RANDOM              1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        MA      1       1     0.8648

                                    ST  ERR   T-RATIO
                                     0.0619    13.97

RESIDUAL SUM OF SQUARES  =       840.275635
                            (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =        13.775010
```

```
PAGE  10     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ACF           VARIABLE IS RGROUP1.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =         -0.4170
STANDARD ERROR OF THE MEAN         =          0.4649
T-VALUE OF MEAN (AGAINST ZERO)     =         -0.8970


AUTOCORRELATIONS

  1- 12       .02 -.15  .10  .07 -.31  .03  .05  0.0
  ST.E        .13  .13  .13  .13  .13  .14  .14  .14

  9- 12      -.05  .21 -.08  .14
  ST.E        .14  .14  .15  .15

 13- 24       .11  .04 -.12 -.12  .08  .08  0.0  .08
  ST.E        .15  .15  .15  .15  .15  .16  .16  .16

 21- 25      -.10 -.05 -.03 -.13  0.0
  ST.E        .16  .16  .16  .16  .16


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.018              +     I     +
 2 -0.152              + XXXXI     +
 3  0.097              +     IXX   +
 4  0.070              +     IXX   +
 5 -0.314            XX+XXXXXI     +
 6  0.028             +      IX     +
 7  0.052             +      IX     +
 8  0.001             +      I      +
 9 -0.047             +     XI      +
10  0.208             +      IXXXXX +
11 -0.077             +    XXI      +
12  0.136             +      IXXX   +
13  0.109             +      IXXX   +
```

```
14  0.041            +       IX      +
15 -0.124            +    XXXI       +
16 -0.125           +     XXXI        +
17  0.083           +        IXX      +
18  0.080           +        IXX      +
19  0.001           +        I        +
20  0.082           +        IXX      +
21 -0.100           +      XXI        +
22 -0.050           +       XI        +
23 -0.028           +       XI        +
24 -0.126           +     XXXI        +
25  0.003           +        I        +
PAGE  11     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ERASE         MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  12     INTERVENTION ANALYSES OF YRC ADMISSIONS




  ARIMA         VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  13     INTERVENTION ANALYSES OF YRC ADMISSIONS




  INDEP         VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
```

```
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  14     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP         VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  15     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ESTIMATION    RESIDUAL=IGROUP1./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04



SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES
                                             1
GROUP1     RANDOM            1-  84   (1-B  )
                                             1
I1         BINARY            1-  84   (1-B  )
                                             1
I2         BINARY            1-  84   (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
```

1	GROUP1	MA	1	1	0.8042
2	I1	UP	1	0	-1.4348
3	I2	UP	1	0	0.6645

ST ERR	T-RATIO
0.0670	12.00
2.1061	-0.68
2.1583	0.31

RESIDUAL SUM OF SQUARES = 986.410889
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 12.330135

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MA	1	1	0.8656
2	I1	UP	1	0	-1.4517
3	I2	UP	1	0	1.0942

ST ERR	T-RATIO
0.0553	15.64
1.8165	-0.80
1.8387	0.60

RESIDUAL SUM OF SQUARES = 928.379883
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80

RESIDUAL MEAN SQUARE = 11.604748
PAGE 17 INTERVENTION ANALYSES OF YRC ADMISSIONS

ACF VARIABLE IS IGROUP1.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS	=	84
MEAN OF THE (DIFFERENCED) SERIES	=	-0.2297
STANDARD ERROR OF THE MEAN	=	0.3670
T-VALUE OF MEAN (AGAINST ZERO)	=	-0.6259

AUTOCORRELATIONS

1- 8	.03	-.13	.10	.08	-.26	.01	.05	-.02
ST.E	.11	.11	.11	.11	.11	.12	.12	.12
9- 12	-.04	.22	-.06	.12				
ST.E	.12	.12	.12	.13				
13- 20	.11	.07	-.12	-.12	.03	.03	-.01	.05
ST.E	.13	.13	.13	.13	.13	.13	.13	.13
21- 25	-.14	-.09	-.01	-.10	.02			
ST.E	.13	.13	.13	.13	.13			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.029               +    IX   +
 2 -0.131               + XXXI    +
 3  0.098               +    IXX  +
 4  0.083               +    IXX  +
 5 -0.265             X+XXXXXI     +
 6  0.011              +     I     +
 7  0.045              +     IX    +
 8 -0.022              +    XI     +
 9 -0.036              +    XI     +
10  0.216              +     IXXXXX+
11 -0.062              +   XXI     +
12  0.118              +     IXXX  +
13  0.109              +     IXXX  +
```

```
14  0.066            +     IXX   +
15 -0.122            +  XXXI     +
16 -0.120            +  XXXI     +
17  0.032            +     IX    +
18  0.028            +     IX    +
19 -0.013            +     I     +
20  0.050            +     IX    +
21 -0.139            +  XXXI     +
22 -0.093           +    XXI      +
23 -0.009           +      I      +
24 -0.100           +    XXI      +
25  0.025           +      IX     +
PAGE  18     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  19     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ACF          VARIABLE IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS           =             63
MEAN OF THE (DIFFERENCED) SERIES =         8.2381
STANDARD ERROR OF THE MEAN       =         0.4115
T-VALUE OF MEAN (AGAINST ZERO)   =        20.0195


AUTOCORRELATIONS

  1- 8      .07  .14  .16  .27  .02  .11  .32  .10
  ST.E      .13  .13  .13  .13  .14  .14  .14  .15

  9- 12     .10 -.02  .12  .01
  ST.E      .15  .15  .15  .16

 13- 20     0.0  .18 -.06 -.02 -.10  .19 -.21  .03
  ST.E      .16  .16  .16  .16  .16  .16  .16  .17

 21- 25    -.03 -.11 -.14 -.08  .09
  ST.E      .17  .17  .17  .17  .17
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.069               +    IXX   +
 2  0.141               +    IXXXX +
 3  0.156               +    IXXXX +
 4  0.269               +    IXXXXX+X
 5  0.016              +     I      +
 6  0.108              +     IXXX   +
 7  0.321              +     IXXXXXX+X
 8  0.097              +     IXX    +
 9  0.097             +      IXX     +
10 -0.019             +      I       +
11  0.122             +      IXXX    +
12  0.006             +      I       +
13 -0.001             +      I       +
14  0.178             +      IXXXXX  +
15 -0.060             +    XXI       +
16 -0.017             +      I       +
17 -0.096             +    XXI       +
18  0.192             +      IXXXXX  +
19 -0.213             + XXXXXI       +
20  0.027             +      IX      +
21 -0.032             +     XI       +
22 -0.114             +   XXXI       +
23 -0.144             +  XXXXI       +
24 -0.080             +    XXI       +
25  0.086             +      IXX     +
PAGE  20     INTERVENTION ANALYSES OF YRC ADMISSIONS



  PACF          VARIABLE IS GROUP2.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS             =            63
MEAN OF THE (DIFFERENCED) SERIES =          8.2381
STANDARD ERROR OF THE MEAN         =          0.4115
T-VALUE OF MEAN (AGAINST ZERO)     =         20.0195


PARTIAL AUTOCORRELATIONS

  1- 8      .07  .14  .14  .24 -.04  .03  .28  .02
```

```
 ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 9- 12     .03 -.15 -.04  0.0
 ST.E      .13  .13  .13  .13

13- 20    -.07  .15 -.15 -.07 -.06  .18 -.15  .02
 ST.E      .13  .13  .13  .13  .13  .13  .13  .13

21- 25    -.08 -.15 -.01  0.0  .11
 ST.E      .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.069              +     IXX   +
 2  0.137              +     IXXX  +
 3  0.142              +     IXXXX +
 4  0.245              +     IXXXXXX
 5 -0.040              +    XI     +
 6  0.031              +     IX    +
 7  0.277              +     IXXXXX+X
 8  0.017              +     I     +
 9  0.032              +     IX    +
10 -0.149              + XXXXI     +
11 -0.039              +    XI     +
12  0.002              +     I     +
13 -0.066              +   XXI     +
14  0.149              +     IXXXX +
15 -0.154              + XXXXI     +
16 -0.069              +   XXI     +
17 -0.064              +   XXI     +
18  0.177              +     IXXXX +
19 -0.150              + XXXXI     +
20  0.017              +     I     +
21 -0.083              +   XXI     +
22 -0.150              + XXXXI     +
23 -0.008              +     I     +
24 -0.001              +     I     +
25  0.112              +     IXXX  +
PAGE  21     INTERVENTION ANALYSES OF YRC ADMISSIONS


 ACF          VARIABLE IS GROUP2.
              DFORDER IS 1.
```

```
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =          -0.0323
STANDARD ERROR OF THE MEAN          =        0.5698
T-VALUE OF MEAN (AGAINST ZERO)      =       -0.0566


AUTOCORRELATIONS

  1-  8      -.53  .03 -.07  .20 -.19 -.06  .23 -.11
  ST.E        .13  .16  .16  .16  .16  .17  .17  .17

  9- 12       .06 -.14  .14 -.06
  ST.E        .17  .17  .18  .18

 13- 20      -.11  .22 -.14  .07 -.20  .36 -.33  .15
  ST.E        .18  .18  .18  .18  .19  .19  .20  .21

 21- 25       .01 -.02 -.05 -.06  .18
  ST.E        .21  .21  .21  .21  .21


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.532       XXXXXXX+XXXXXI     +
 2  0.033            +       IX      +
 3 -0.070            +     XXI       +
 4  0.203            +       IXXXXX  +
 5 -0.185            +  XXXXXI       +
 6 -0.060            +     XXI       +
 7  0.228            +       IXXXXXX +
 8 -0.110            +    XXXI       +
 9  0.058            +       IX      +
10 -0.143           +    XXXXI        +
11  0.137           +        IXXX     +
12 -0.057           +       XI        +
13 -0.105           +     XXXI        +
14  0.225           +        IXXXXXX  +
15 -0.143           +    XXXXI        +
16  0.065           +        IXX      +
17 -0.201           +   XXXXXI        +
18  0.365           +        IXXXXXXXXX
19 -0.330          + XXXXXXXXI         +
```

```
20  0.152           +         IXXXX      +
21  0.009           +         I          +
22 -0.019           +         I          +
23 -0.055           +        XI          +
24 -0.055           +        XI          +
25  0.181           +         IXXXXX     +
PAGE  22      INTERVENTION ANALYSES OF YRC ADMISSIONS
```

```
  PACF          VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./
```

```
NUMBER OF OBSERVATIONS             =              62
MEAN OF THE (DIFFERENCED) SERIES =           -0.0323
STANDARD ERROR OF THE MEAN         =          0.5698
T-VALUE OF MEAN (AGAINST ZERO)     =         -0.0566
```

```
PARTIAL AUTOCORRELATIONS

  1-  8     -.53 -.35 -.37 -.06 -.13 -.34 -.05 -.06
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      .11 -.01 -.05  .02
  ST.E       .13  .13  .13  .13

 13- 20     -.21  .09 -.01 -.01 -.22  .09 -.07  .03
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25      .10 -.04 -.05 -.15 -.10
  ST.E       .13  .13  .13  .13  .13
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1 -0.532         XXXXXXX+XXXXXI     +
 2 -0.349             XXX+XXXXXI     +
 3 -0.368             XXX+XXXXXI     +
 4 -0.058                +    XI     +
 5 -0.132                +  XXXI     +
 6 -0.336              XX+XXXXXI     +
```

```
 7 -0.054            +    XI     +
 8 -0.064            +   XXI     +
 9  0.108            +     IXXX  +
10 -0.013            +     I     +
11 -0.050            +    XI     +
12  0.017            +     I     +
13 -0.211            +XXXXXI     +
14  0.088            +     IXX   +
15 -0.008            +     I     +
16 -0.007            +     I     +
17 -0.216            +XXXXXI     +
18  0.095            +     IXX   +
19 -0.068            +   XXI     +
20  0.027            +     IX    +
21  0.101            +     IXXX  +
22 -0.041            +    XI     +
23 -0.053            +    XI     +
24 -0.155            + XXXXI     +
25 -0.096            +   XXI     +
PAGE  23     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ARIMA         VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  24     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ESTIMATION    RESIDUAL IS RGROUP2.
                TIME=1,63./


ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04
```

```
SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE   VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                 1
GROUP2     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1      0.8702

                                ST  ERR   T-RATIO
                                 0.0647     13.45

RESIDUAL SUM OF SQUARES   =       626.020996
DEGREES OF FREEDOM        =               61
RESIDUAL MEAN SQUARE      =        10.262639
PAGE  25     INTERVENTION ANALYSES OF YRC ADMISSIONS


ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE   VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                 1
GROUP2     RANDOM             1-  84   (1-B   )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       MA      1       1      0.8712

                                ST  ERR   T-RATIO
                                 0.0633     13.76

RESIDUAL SUM OF SQUARES   =       609.922607
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM        =               61
RESIDUAL MEAN SQUARE      =         9.998731
```

```
  ACF           VARIABLE IS RGROUP2.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS             =           63
MEAN OF THE (DIFFERENCED) SERIES   =      -0.2989
STANDARD ERROR OF THE MEAN         =       0.3943
T-VALUE OF MEAN (AGAINST ZERO)     =      -0.7580


AUTOCORRELATIONS

  1-  8     -.16 -.06  0.0  .16 -.14  0.0  .28  .02
  ST.E       .13  .13  .13  .13  .13  .14  .14  .14

  9- 12      .04 -.10  .10 -.03
  ST.E       .14  .14  .15  .15

 13- 20     -.04  .21 -.08  .01 -.09  .27 -.22  .08
  ST.E       .15  .15  .15  .15  .15  .15  .16  .16

 21- 25      0.0 -.08 -.09 -.02  .18
  ST.E       .17  .17  .17  .17  .17


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.160              + XXXXI     +
 2 -0.057              +    XI     +
 3 -0.005              +     I     +
 4  0.158              +     IXXXX +
 5 -0.145              + XXXXI     +
 6 -0.003             +      I      +
 7  0.276             +      IXXXXXXX
 8  0.021             +      IX     +
 9  0.036             +      IX     +
10 -0.100             +   XXXI      +
11  0.096             +      IXX    +
12 -0.026             +     XI      +
13 -0.043             +     XI      +
```

```
14  0.213           +      IXXXXX +
15 -0.076           +    XXI      +
16  0.010           +      I      +
17 -0.086           +    XXI      +
18  0.271           +      IXXXXXXX
19 -0.223          + XXXXXXI       +
20  0.080          +       IXX     +
21  0.002          +       I       +
22 -0.085          +     XXI       +
23 -0.093          +     XXI       +
24 -0.021          +      XI       +
25  0.175          +       IXXXX   +
PAGE  27     INTERVENTION ANALYSES OF YRC ADMISSIONS


  ERASE         MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  28     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ARIMA         VARIABLE IS GROUP2.
                DFORDER IS 1.
                MAORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  29     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP         VARIABLE IS I1.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
```

```
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1
PAGE  30     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP         VARIABLE IS I2.
                DFORDER IS 1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE     I1        I2
PAGE  31     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ESTIMATION    RESIDUAL=IGROUP2 /



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                              1
GROUP2       RANDOM             1-  84  (1-B  )
                                              1
I1           BINARY             1-  84  (1-B  )
                                              1
I2           BINARY             1-  84  (1-B  )

PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
```

1	GROUP2	MA	1	1	0.8852
2	I1	UP	1	0	0.3034
3	I2	UP	1	0	-1.2790

ST ERR	T-RATIO
0.0553	16.00
1.6125	0.19
1.5745	-0.81

RESIDUAL SUM OF SQUARES = 769.782471
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 9.222280

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	MA	1	1	0.8866
2	I1	UP	1	0	0.2767
3	I2	UP	1	0	-1.2779

ST ERR	T-RATIO
0.0543	16.33
1.5915	0.17
1.5563	-0.82

RESIDUAL SUM OF SQUARES = 753.783691
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80

```
RESIDUAL MEAN SQUARE     =          9.422296
PAGE  33     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./


NUMBER OF OBSERVATIONS            =             84
MEAN OF THE (DIFFERENCED) SERIES =          -0.2892
STANDARD ERROR OF THE MEAN        =           0.3279
T-VALUE OF MEAN (AGAINST ZERO)    =          -0.8819


AUTOCORRELATIONS

  1-  8     -.14 -.03 -.05  .07 -.06 -.01  .22 -.02
  ST.E       .11  .11  .11  .11  .11  .11  .11  .12

  9- 12      .04 -.08  .07  0.0
  ST.E       .12  .12  .12  .12

 13- 20     -.02  .16 -.08 -.05  .05  .21 -.14 -.04
  ST.E       .12  .12  .12  .12  .12  .12  .13  .13

 21- 25     -.01 -.08 -.11  .01  .16
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1 -0.138               + XXXI    +
 2 -0.027               +   XI    +
 3 -0.053               +   XI    +
 4  0.073               +    IXX  +
 5 -0.060               +  XXI    +
 6 -0.011              +     I     +
 7  0.222              +     IXXXXXX
 8 -0.020              +    XI     +
 9  0.040              +     IX    +
10 -0.084              +   XXI     +
11  0.070              +     IXX   +
12 -0.004              +     I     +
13 -0.015              +     I     +
```

```
14  0.163            +     IXXXX +
15 -0.078            +   XXI     +
16 -0.049            +    XI     +
17  0.049            +     IX    +
18  0.213            +     IXXXXX+
19 -0.140            +  XXXI     +
20 -0.044            +    XI     +
21 -0.013            +     I     +
22 -0.082            +   XXI     +
23 -0.113            +  XXXI     +
24  0.010            +     I     +
25  0.163            +     IXXXX +
PAGE  34     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ERASE         MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  35     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ACF           VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =           2.3333
STANDARD ERROR OF THE MEAN          =        0.2111
T-VALUE OF MEAN (AGAINST ZERO)      =       11.0553


AUTOCORRELATIONS

  1- 8       .20  .03  .02 -.03  0.0  .05  .31  .01
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14

  9- 12     -.07 -.17 -.03  .03
  ST.E       .14  .14  .15  .15

 13- 20      .05 -.10 -.01  .10  0.0  .16  .11  .06
  ST.E       .15  .15  .15  .15  .15  .15  .15  .15

 21- 25     -.14 -.08  .05 -.09  .06
  ST.E       .15  .16  .16  .16  .16
```

```
PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.202              +     IXXXXX+
 2  0.031              +     IX    +
 3  0.017              +     I     +
 4 -0.031              +    XI     +
 5  0.003              +     I     +
 6  0.048              +     IX    +
 7  0.310              +     IXXXXX+XX
 8  0.008             +      I      +
 9 -0.073             +    XXI      +
10 -0.165             + XXXXI      +
11 -0.028             +     XI      +
12  0.027             +      IX     +
13  0.053             +      IX     +
14 -0.097             +    XXI      +
15 -0.013             +      I      +
16  0.103             +      IXXX   +
17 -0.003             +      I      +
18  0.165             +      IXXXX  +
19  0.114             +      IXXX   +
20  0.058            +       IX      +
21 -0.136            +    XXXI       +
22 -0.083            +     XXI       +
23  0.050            +       IX      +
24 -0.086            +     XXI       +
25  0.063            +       IXX     +
PAGE  36     INTERVENTION ANALYSES OF YRC ADMISSIONS


  PACF          VARIABLE IS GROUP3.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS            =             63
MEAN OF THE (DIFFERENCED) SERIES =         2.3333
STANDARD ERROR OF THE MEAN        =         0.2111
T-VALUE OF MEAN (AGAINST ZERO)    =        11.0553


PARTIAL AUTOCORRELATIONS

  1-  8      .20 -.01  .01 -.04  .02  .05  .31 -.13
```

```
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.06 -.17  .09  .02
  ST.E       .13  .13  .13  .13

 13- 20      .05 -.29  .13  .16  .12  .08 -.02 -.05
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.01 -.06  0.0 -.22  .06
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.202              +     IXXXXX+
 2 -0.010              +     I     +
 3  0.013              +     I     +
 4 -0.039              +    XI     +
 5  0.017              +     I     +
 6  0.046              +     IX    +
 7  0.305              +     IXXXXX+XX
 8 -0.131              +  XXXI     +
 9 -0.064              +   XXI     +
10 -0.173              + XXXXI     +
11  0.085              +     IXX   +
12  0.024              +     IX    +
13  0.055              +     IX    +
14 -0.290             X+XXXXXI     +
15  0.129              +     IXXX  +
16  0.162              +     IXXXX +
17  0.119              +     IXXX  +
18  0.080              +     IXX   +
19 -0.015              +     I     +
20 -0.052              +    XI     +
21 -0.011              +     I     +
22 -0.058              +    XI     +
23 -0.004              +     I     +
24 -0.222              XXXXXXI     +
25  0.056              +     IX    +
PAGE  37     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./
```

```
THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  38     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ESTIMATION   RESIDUAL IS RGROUP3.
               TIME=1,63./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04



SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP3     RANDOM             1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MEAN    1       0      2.3333

                                ST  ERR   T-RATIO
                                 0.2111     11.06

RESIDUAL SUM OF SQUARES  =       173.999527
DEGREES OF FREEDOM       =               62
RESIDUAL MEAN SQUARE     =         2.806443
PAGE  39     INTERVENTION ANALYSES OF YRC ADMISSIONS



ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
            LESS THAN 0.1000E-03
```

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	2.3333

ST ERR	T-RATIO
0.2111	11.05

RESIDUAL SUM OF SQUARES = 173.999527
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 62
RESIDUAL MEAN SQUARE = 2.806443

ACF VARIABLE IS RGROUP3.
MAXLAG IS 25.
TIME=1,63./

NUMBER OF OBSERVATIONS = 63
MEAN OF THE (DIFFERENCED) SERIES = 0.0
STANDARD ERROR OF THE MEAN = 0.2111
T-VALUE OF MEAN (AGAINST ZERO) = 0.0

AUTOCORRELATIONS

1- 8	.20	.03	.02	-.03	0.0	.05	.31	.01
ST.E	.13	.13	.13	.13	.13	.13	.13	.14
9- 12	-.07	-.17	-.03	.03				
ST.E	.14	.14	.15	.15				
13- 20	.05	-.10	-.01	.10	0.0	.16	.11	.06
ST.E	.15	.15	.15	.15	.15	.15	.15	.15
21- 25	-.14	-.08	.05	-.09	.06			
ST.E	.15	.16	.16	.16	.16			

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
 1  0.202               +    IXXXXX+
 2  0.031               +    IX    +
 3  0.017               +    I     +
 4 -0.031               +   XI     +
 5  0.003               +    I     +
 6  0.048               +    IX    +
 7  0.310               +    IXXXXX+XX
 8  0.008              +     I      +
 9 -0.073              +   XXI      +
10 -0.165              + XXXXI      +
11 -0.028              +    XI      +
12  0.027              +     IX     +
13  0.053              +     IX     +
14 -0.097              +   XXI      +
15 -0.013              +     I      +
16  0.103              +     IXXX   +
17 -0.003              +     I      +
18  0.165              +     IXXXX  +
19  0.114              +     IXXX   +
20  0.058             +      IX      +
21 -0.136             +    XXXI      +
22 -0.083             +     XXI      +
23  0.050             +      IX      +
24 -0.086             +     XXI      +
25  0.063             +      IXX     +
```

PAGE 41 INTERVENTION ANALYSES OF YRC ADMISSIONS

ERASE MODEL./

UNIVARIATE TIME SERIES MODEL ERASED

PAGE 42 INTERVENTION ANALYSES OF YRC ADMISSIONS

ARIMA VARIABLE IS GROUP3.
CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

```
THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  43     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP         VARIABLE IS I1.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  44     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP         VARIABLE IS I2.
                UPORDER IS '(0)'.
                TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2
PAGE  45     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ESTIMATION    RESIDUAL=IGROUP3./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
                      LESS THAN 0.1000E-04
```

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	2.3333
2	I1	UP	1	0	-0.0833
3	I2	UP	1	0	-0.5833

ST ERR	T-RATIO
0.2010	11.61
0.5024	-0.17
0.7036	-0.83

RESIDUAL SUM OF SQUARES = 206.249207
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 2.546286
PAGE 46 INTERVENTION ANALYSES OF YRC ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

```
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP3       MEAN     1      0    2.3333
     2  I1            UP      1      0   -0.0833
     3  I2            UP      1      0   -0.5833

                                ST  ERR   T-RATIO
                                 0.2010    11.61
                                 0.5031    -0.17
                                 0.7040    -0.83

RESIDUAL SUM OF SQUARES  =       206.249481
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               81
RESIDUAL MEAN SQUARE     =         2.546289
PAGE  47     INTERVENTION ANALYSES OF YRC ADMISSIONS
```

```
  ACF          VARIABLE IS IGROUP3.
               MAXLAG IS 25./


NUMBER OF OBSERVATIONS              =           84
MEAN OF THE (DIFFERENCED) SERIES =          0.0000
STANDARD ERROR OF THE MEAN          =       0.1720
T-VALUE OF MEAN (AGAINST ZERO)      =       0.0000


AUTOCORRELATIONS

  1-  8     .16  0.0  .01 -.08  .01  .04  .29  0.0
  ST.E      .11  .11  .11  .11  .11  .11  .11  .12

  9- 12    -.08 -.13 -.03  .07
  ST.E      .12  .12  .12  .12

 13- 20    -.02 -.12 -.02  .01  .04  .17  .13  .02
  ST.E      .12  .12  .13  .13  .13  .13  .13  .13

 21- 25    -.17 -.09  .01 -.02  .04
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                             I
```

```
 1  0.165              +     IXXXX+
 2  0.005              +     I    +
 3  0.007              +     I    +
 4 -0.078              +   XXI    +
 5  0.008             +      I     +
 6  0.038             +      IX    +
 7  0.291             +      IXXXXX+X
 8  0.000             +      I     +
 9 -0.077             +    XXI     +
10 -0.128             +   XXXI     +
11 -0.027             +     XI     +
12  0.070             +      IXX   +
13 -0.020             +      I     +
14 -0.120             +   XXXI     +
15 -0.017             +      I     +
16  0.009             +      I     +
17  0.044             +      IX    +
18  0.174             +      IXXXX +
19  0.127             +      IXXX  +
20  0.022             +      IX    +
21 -0.169             + XXXXI      +
22 -0.094            +     XXI      +
23  0.009            +       I      +
24 -0.022            +      XI      +
25  0.037            +       IX     +
PAGE  48     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ERASE         MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  49     INTERVENTION ANALYSES OF YRC ADMISSIONS




  ARIMA         VARIABLE IS GROUP3.
                CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  50     INTERVENTION ANALYSES OF YRC ADMISSIONS
```

```
  INDEP          VARIABLE IS I1.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  51     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP          VARIABLE IS I2.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  52     INTERVENTION ANALYSES OF YRC ADMISSIONS



  INDEP          VARIABLE IS CLOSE.
                 UPORDER IS '(0)'.
                 TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2        CLOSE
PAGE  53     INTERVENTION ANALYSES OF YRC ADMISSIONS



  ESTIMATION    RESIDUAL=IGROUP3./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	2.3667	0.2066	11.46
2	I1	UP	1	0	0.5833	1.0330	0.56
3	I2	UP	1	0	-0.5833	0.7056	-0.83
4	CLOSE	UP	1	0	-0.7000	0.9467	-0.74

RESIDUAL SUM OF SQUARES = 204.849335
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 2.560616

PAGE 54 INTERVENTION ANALYSES OF YRC ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	2.3667	0.2066	11.46
2	I1	UP	1	0	0.5833	1.0330	0.56
3	I2	UP	1	0	-0.5833	0.7056	-0.83
4	CLOSE	UP	1	0	-0.7000	0.9467	-0.74

RESIDUAL SUM OF SQUARES = 204.849182
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 2.560615
PAGE 55 INTERVENTION ANALYSES OF YRC ADMISSIONS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.1714
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

1- 8	.16	0.0	0.0	-.09	0.0	.03	.28	-.02
ST.E	.11	.11	.11	.11	.11	.11	.11	.12

```
  9- 12     -.09 -.14 -.04  .07
  ST.E       .12  .12  .12  .12

 13- 20     -.01 -.12 -.02  .01  .04  .18  .12  .02
  ST.E       .12  .12  .13  .13  .13  .13  .13  .13

 21- 25     -.19 -.11  0.0 -.03  .04
  ST.E       .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
LAG CORR
                              I
 1  0.161                +    IXXXX+
 2 -0.002                +    I    +
 3 -0.002                +    I    +
 4 -0.088                +  XXI    +
 5 -0.001               +     I     +
 6  0.032               +     IX    +
 7  0.279               +     IXXXXX+X
 8 -0.017               +     I     +
 9 -0.090               +   XXI     +
10 -0.145               + XXXXI     +
11 -0.037               +    XI     +
12  0.067               +     IXX   +
13 -0.008               +     I     +
14 -0.116               +  XXXI     +
15 -0.025               +    XI     +
16  0.008               +     I     +
17  0.040               +     IX    +
18  0.177               +     IXXXX +
19  0.120               +     IXXX  +
20  0.018               +     I     +
21 -0.188               +XXXXXI     +
22 -0.114              +   XXXI      +
23 -0.005              +      I      +
24 -0.027              +     XI      +
25  0.038              +      IX     +
PAGE  56     INTERVENTION ANALYSES OF YRC ADMISSIONS
```

END./

```
NUMBER OF INTEGER WORDS OF STORAGE USED IN
                    PRECEDING PROBLEM 1954
CPU TIME USED      5.643 SECONDS
PAGE  57     INTERVENTION ANALYSES OF YRC ADMISSIONS

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
    JULY 19, 1982  AT 11:58:22


PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED
```

Output For Total Mental Health Admissions

Only the output for total admissions is presented here. The job card images for the total admissions runs were virtually the same as the job cards shown for previous runs. The data are listed in the material above. The total admissions runs combined first admissions and readmissions for each group.

```
PAGE   1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940          TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
 OCTOBER  2, 1982  AT 13:30:02

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE = 0
/ PROBLEM       TITLE IS 'TIME SERIES ANALYSIS OF
                TOTAL MH ADMISSIONS'.
/ INPUT         VARIABLES ARE 9.
                FORMAT IS '(6F3.0,3F2.0)'.
/ VARIABLE      NAMES=G1MH1ST,G2MH1ST,G3MH1ST,G1MHREAD,
                G2MHREAD,G3MHREAD,
                I1,I2,CLOSE,GROUP1,GROUP2,GROUP3.
                ADD=3.
/ TRANSFORM     GROUP1 = G1MH1ST + G1MHREAD.
                GROUP2 = G2MH1ST + G2MHREAD.
                GROUP3 = G3MH1ST + G3MHREAD.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
PROBLEM TITLE IS
TIME SERIES ANALYSIS OF TOTAL MH ADMISSIONS

NUMBER OF VARIABLES TO READ IN                        9
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS          3
TOTAL NUMBER OF VARIABLES                            12
NUMBER OF CASES TO READ IN                       TO END
CASE LABELING VARIABLES
```

```
MISSING VALUES CHECKED BEFORE OR AFTER TRANS    NEITHER
BLANKS ARE                                      MISSING
INPUT UNIT NUMBER                                     5
REWIND INPUT UNIT PRIOR TO READING    DATA           NO
NUMBER OF WORDS OF DYNAMIC STORAGE                45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT             1

***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 G1MH1ST      2 G2MH1ST      3 G3MH1ST
     4 G1MHREAD     5 G2MHREAD     6 G3MHREAD
     7 I1           8 I2           9 CLOSE
    10 GROUP1      11 GROUP2      12 GROUP3
INPUT FORMAT IS
(6F3.0,3F2.0)
MAXIMUM LENGTH DATA RECORD IS   24 CHARACTERS
I N P U T   V A R I A B L E S
   VARIABLE       RECORD   COLUMNS     FIELD  TYPE
 INDEX   NAME       NO    BEGIN  END   WIDTH
 ----- --------  ----   ----- -----  -----  ----
     1 G1MH1ST      1       1     3      3     F
     2 G2MH1ST      1       4     6      3     F
     3 G3MH1ST      1       7     9      3     F
     4 G1MHREAD     1      10    12      3     F
     5 G2MHREAD     1      13    15      3     F
     6 G3MHREAD     1      16    18      3     F
     7 I1           1      19    20      2     F
     8 I2           1      21    22      2     F
     9 CLOSE        1      23    24      2     F


------------------------------------------
BMDP FILE IS BEING WRITTEN ON UNIT       3
CODE.     IS     TEMP
CONTENT   IS     DATA
LABEL     IS
  OCTOBER  2, 1982      13:30:02
VARIABLES ARE
     1 G1MH1ST      2 G2MH1ST      3 G3MH1ST
     4 G1MHREAD     5 G2MHREAD     6 G3MHREAD
     7 I1           8 I2           9 CLOSE
    10 GROUP1      11 GROUP2      12 GROUP3
BASED ON INPUT FORMAT SUPPLIED
1 RECORDS READ PER CASE

NUMBER OF CASES READ             84


BMDP   FILE ON UNIT  3 HAS BEEN COMPLETED
```

```
-------------------------------------------
NUMBER OF CASES WRITTEN TO FILE        84
PAGE   2     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ACF         VARIABLE  IS GROUP1.
              MAXLAG IS 25.
              TIME=1,63./


NUMBER OF OBSERVATIONS             =              63
MEAN OF THE (DIFFERENCED) SERIES =         121.0159
STANDARD ERROR OF THE MEAN         =           2.8281
T-VALUE OF MEAN (AGAINST ZERO)     =          42.7905


AUTOCORRELATIONS

  1- 8      .48  .31  .29  .20  .11  .16  .15  .22
  ST.E      .13  .15  .16  .17  .17  .18  .18  .18

  9- 12     .22  .21  .15  .15
  ST.E      .18  .19  .19  .19

 13- 20     .01  .10  .23  .04 -.01  .04 -.06 -.13
  ST.E      .20  .20  .20  .20  .20  .20  .20  .20

 21- 25    -.04 -.09 -.07  0.0 -.01
  ST.E      .20  .20  .20  .20  .20


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.484              +     IXXXXX+XXXXXX
 2  0.310             +      IXXXXXX+X
 3  0.292            +       IXXXXXXX+
 4  0.199            +       IXXXXX  +
 5  0.114           +        IXXX     +
 6  0.165           +        IXXXX    +
 7  0.148           +        IXXXX    +
 8  0.219           +        IXXXXX   +
 9  0.219           +        IXXXXX   +
10  0.206           +        IXXXXX   +
11  0.153           +        IXXXX    +
12  0.148           +        IXXXX    +
13  0.012          +         I         +
```

```
14  0.102           +         IXXX      +
15  0.228           +         IXXXXXX   +
16  0.041           +         IX        +
17 -0.008           +         I         +
18  0.036           +         IX        +
19 -0.058           +        XI         +
20 -0.130           +      XXXI         +
21 -0.039           +        XI         +
22 -0.090           +       XXI         +
23 -0.074           +       XXI         +
24 -0.000           +         I         +
25 -0.006           +         I         +
PAGE   3      TIME SERIES ANALYSIS OF TOTAL
              MH ADMISSIONS

  PACF         VARIABLE  IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =        121.0159
STANDARD ERROR OF THE MEAN          =         2.8281
T-VALUE OF MEAN (AGAINST ZERO)      =        42.7905


PARTIAL AUTOCORRELATIONS

  1-  8       .48  .10  .14 -.01 -.03  .11  .03  .16
  ST.E        .13  .13  .13  .13  .13  .13  .13  .13

  9- 12       .04  .04 -.03  .02
  ST.E        .13  .13  .13  .13

 13- 20      -.14  .13  .18 -.21 -.07 -.05 -.08 -.10
  ST.E        .13  .13  .13  .13  .13  .13  .13  .13

 21- 25       .09 -.09 -.03  .05  0.0
  ST.E        .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1  0.484               +     IXXXXX+XXXXXX
 2  0.099               +     IXX    +
 3  0.144               +     IXXXX +
 4 -0.007               +     I      +
```

```
 5 -0.031           +    XI     +
 6  0.105           +     IXXX  +
 7  0.026           +     IX    +
 8  0.157           +     IXXXX +
 9  0.042           +     IX    +
10  0.044           +     IX    +
11 -0.029           +    XI     +
12  0.021           +     IX    +
13 -0.142           + XXXXI     +
14  0.131           +     IXXX  +
15  0.184           +     IXXXXX+
16 -0.211           +XXXXXI     +
17 -0.070           +   XXI     +
18 -0.046           +    XI     +
19 -0.079           +   XXI     +
20 -0.103           +  XXXI     +
21  0.093           +     IXX   +
22 -0.088           +   XXI     +
23 -0.027           +    XI     +
24  0.051           +     IX    +
25 -0.005           +     I     +
PAGE   4     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ACF          VARIABLE  IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS             =            62
MEAN OF THE (DIFFERENCED) SERIES =         -1.0484
STANDARD ERROR OF THE MEAN         =         2.7667
T-VALUE OF MEAN (AGAINST ZERO)     =        -0.3789


AUTOCORRELATIONS

  1-  8      -.24 -.25  .07 -.01 -.13  .08 -.09  .08
  ST.E        .13  .13  .14  .14  .14  .14  .14  .15

  9- 12       .02  .03 -.02  .15
  ST.E        .15  .15  .15  .15

 13- 20      -.20 -.10  .30 -.09 -.10  .09 -.02 -.14
  ST.E        .15  .15  .15  .16  .16  .17  .17  .17

 21- 25       .16 -.03 -.07  .03  .04
  ST.E        .17  .17  .17  .17  .17
```

```
PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1 -0.243               XXXXXXI     +
 2 -0.253              +XXXXXXI      +
 3  0.067              +      IXX    +
 4 -0.005              +      I      +
 5 -0.132              +   XXXI      +
 6  0.077              +      IXX    +
 7 -0.092              +    XXI      +
 8  0.081              +      IXX    +
 9  0.017              +      I      +
10  0.027              +      IX     +
11 -0.022              +     XI      +
12  0.150              +      IXXXX  +
13 -0.203              + XXXXXI      +
14 -0.100             +    XXXI       +
15  0.301             +        IXXXXXXXXX
16 -0.086             +     XXI       +
17 -0.097             +     XXI       +
18  0.067             +       IXX     +
19 -0.017             +       I       +
20 -0.135             +    XXXI       +
21  0.156             +       IXXXX   +
22 -0.029             +      XI       +
23 -0.072             +     XXI       +
24  0.028             +       IX      +
25  0.045             +       IX      +
PAGE   5     TIME SERIES ANALYSIS OF TOTAL
             MH ADMISSIONS

  PACF        VARIABLE  IS GROUP1.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./


NUMBER OF OBSERVATIONS              =          62
MEAN OF THE (DIFFERENCED) SERIES =         -1.0484
STANDARD ERROR OF THE MEAN          =       2.7667
T-VALUE OF MEAN (AGAINST ZERO)      =      -0.3789


PARTIAL AUTOCORRELATIONS

  1- 8      -.24 -.33 -.11 -.12 -.22 -.08 -.25 -.07
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13
```

```
  9- 12    -.12 -.03 -.05  .16
  ST.E      .13  .13  .13  .13

 13- 20    -.10 -.16  .22  .01  .10  .04  .08 -.12
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     .11  .03 -.06 -.02 -.03
  ST.E      .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.243                XXXXXXI     +
 2 -0.331              XX+XXXXXI     +
 3 -0.113                +  XXXI     +
 4 -0.123                +  XXXI     +
 5 -0.216                +XXXXXI     +
 6 -0.084                +   XXI     +
 7 -0.247                XXXXXXI     +
 8 -0.065                +   XXI     +
 9 -0.118                +  XXXI     +
10 -0.027                +    XI     +
11 -0.054                +    XI     +
12  0.156                +     IXXXX +
13 -0.103                +  XXXI     +
14 -0.155                + XXXXI     +
15  0.216                +     IXXXXX+
16  0.010                +     I     +
17  0.104                +     IXXX  +
18  0.045                +     IX    +
19  0.077                +     IXX   +
20 -0.118                +  XXXI     +
21  0.106                +     IXXX  +
22  0.032                +     IX    +
23 -0.056                +    XI     +
24 -0.024                +    XI     +
25 -0.027                +    XI     +
PAGE   6     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ARIMA       VARIABLE IS GROUP1.
              CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL
```

```
THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE    7      TIME SERIES ANALYSIS OF
               TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS RGROUP1.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP1     RANDOM              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1       MEAN     1       0   121.0158

                                   ST  ERR   T-RATIO
                                    2.8281     42.79

RESIDUAL SUM OF SQUARES   =      31240.859375
DEGREES OF FREEDOM        =                62
RESIDUAL MEAN SQUARE      =        503.884766
PAGE    8      TIME SERIES ANALYSIS OF
               TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS
THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP1     RANDOM              1-  84
```

```
PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP1        MEAN     1      0   121.0158

                                    ST  ERR   T-RATIO
                                     2.8281    42.79

RESIDUAL SUM OF SQUARES  =      31240.867188
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                62
RESIDUAL MEAN SQUARE     =        503.884766
PAGE   9     TIME SERIES ANALYSIS OF TOTAL MH ADMISSIONS

  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS               =              63
MEAN OF THE (DIFFERENCED) SERIES =              0.0000
STANDARD ERROR OF THE MEAN           =          2.8281
T-VALUE OF MEAN (AGAINST ZERO)       =          0.0000


AUTOCORRELATIONS

  1-  8      .48  .31  .29  .20  .11  .16  .15  .22
  ST.E       .13  .15  .16  .17  .17  .18  .18  .18

  9- 12      .22  .21  .15  .15
  ST.E       .18  .19  .19  .19

 13- 20      .01  .10  .23  .04 -.01  .04 -.06 -.13
  ST.E       .20  .20  .20  .20  .20  .20  .20  .20

 21- 25     -.04 -.09 -.07  0.0 -.01
  ST.E       .20  .20  .20  .20  .20

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.484              +     IXXXXX+XXXXXX
 2  0.310             +      IXXXXXX+X
 3  0.292            +       IXXXXXXX+
 4  0.199            +       IXXXXX  +
 5  0.114           +        IXXX     +
 6  0.165           +        IXXXX    +
 7  0.148           +        IXXXX    +
```

```
 8  0.219          +        IXXXXX   +
 9  0.219          +        IXXXXX   +
10  0.206          +        IXXXXX   +
11  0.153          +        IXXXX    +
12  0.148          +        IXXXX    +
13  0.012         +         I         +
14  0.102         +         IXXX      +
15  0.228         +         IXXXXXX   +
16  0.041         +         IX        +
17 -0.008         +         I         +
18  0.036         +         IX        +
19 -0.058         +        XI         +
20 -0.130         +      XXXI         +
21 -0.039         +        XI         +
22 -0.090         +       XXI         +
23 -0.074         +       XXI         +
24 -0.000         +         I         +
25 -0.006         +         I         +
PAGE  10     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  11     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  12     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  13     TIME SERIES ANALYSIS OF
```

```
            TOTAL MH ADMISSIONS

  INDEP       VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  14      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES

GROUP1     RANDOM           1-  84

I1         BINARY           1-  84

I2         BINARY           1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1      MEAN     1       0   121.0158
      2  I1           UP      1       0   -22.3492
      3  I2           UP      1       0     -0.5556

                                    ST  ERR   T-RATIO
                                    2.5932     46.67
                                    6.4832     -3.45
                                    9.0653     -0.06

RESIDUAL SUM OF SQUARES  =     34316.394531
DEGREES OF FREEDOM       =               81
RESIDUAL MEAN SQUARE     =       423.659180
PAGE  15      TIME SERIES ANALYSIS OF
```

TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	MEAN	1	0	121.0158
2	I1	UP	1	0	-22.3492
3	I2	UP	1	0	-0.5556

ST ERR	T-RATIO
2.5932	46.67
6.4833	-3.45
9.0788	-0.06

RESIDUAL SUM OF SQUARES = 34316.398438
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 423.659180
PAGE 16 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ACF VARIABLE IS IGROUP1.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 2.2186
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

```
  1- 8      .44  .28  .28  .15  .07  .13  .09  .18
  ST.E      .11  .13  .14  .14  .14  .14  .15  .15

  9- 12     .23  .19  .17  .16
  ST.E      .15  .15  .16  .16

 13- 20     .03  .07  .18 -.02 -.05  .02 -.06 -.14
  ST.E      .16  .16  .16  .16  .16  .16  .16  .16

 21- 25     .01 -.03 -.04  0.0  0.0
  ST.E      .17  .17  .17  .17  .17
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.441                +   IXXXX+XXXXXX
 2  0.283               +    IXXXXX+X
 3  0.278              +     IXXXXXXX
 4  0.148              +     IXXXX  +
 5  0.067              +     IXX    +
 6  0.130              +     IXXX   +
 7  0.094              +     IXX    +
 8  0.185              +     IXXXXX +
 9  0.225              +     IXXXXXX+
10  0.191             +      IXXXXX  +
11  0.173             +      IXXXX   +
12  0.155             +      IXXXX   +
13  0.030             +      IX      +
14  0.071             +      IXX     +
15  0.181             +      IXXXXX  +
16 -0.016             +      I       +
17 -0.053             +     XI       +
18  0.015             +      I       +
19 -0.063             +    XXI       +
20 -0.139             +   XXXI       +
21  0.014             +      I       +
22 -0.033             +     XI       +
23 -0.044             +     XI       +
24  0.001             +      I       +
25 -0.003             +      I       +
PAGE  17     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
```

```
PAGE  18      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  ARIMA        VARIABLE IS GROUP1.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  19      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  20      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE  21      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS CLOSE.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
```

```
INPUT  VARIABLE = NOISE     I1        I2        CLOSE
PAGE  22     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP1./


ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES

GROUP1     RANDOM            1-  84

I1         BINARY            1-  84

I2         BINARY            1-  84

CLOSE      BINARY            1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1      MEAN     1       0   122.2000
      2  I1           UP      1       0     1.3333
      3  I2           UP      1       0    -0.5556
      4  CLOSE        UP      1       0   -24.8666

                                ST  ERR   T-RATIO
                                 2.6041    46.93
                                13.0305     0.10
                                 8.8908    -0.06
                                11.9339    -2.08

RESIDUAL SUM OF SQUARES   =     32549.671875
DEGREES OF FREEDOM        =               80
RESIDUAL MEAN SQUARE      =       406.870850
PAGE  23     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS
ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03
```

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP1	MEAN	1	0	122.2000	2.6041	46.93
2	I1	UP	1	0	1.3333	13.0172	0.10
3	I2	UP	1	0	-0.5556	8.8969	-0.06
4	CLOSE	UP	1	0	-24.8666	11.9339	-2.08

RESIDUAL SUM OF SQUARES = 32549.679688
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 406.870850
PAGE 24 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ACF VARIABLE IS IGROUP1.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = -0.0000
STANDARD ERROR OF THE MEAN = 2.1607
T-VALUE OF MEAN (AGAINST ZERO) = -0.0000

AUTOCORRELATIONS

1- 8	.40	.26	.27	.17	.11	.17	.12	.19
ST.E	.11	.13	.13	.14	.14	.14	.14	.14

```
  9- 12      .21  .16  .13  .13
  ST.E       .15  .15  .15  .15

 13- 20      .02  .08  .18  .01 -.05  .02 -.10 -.16
  ST.E       .16  .16  .16  .16  .16  .16  .16  .16

 21- 25      .02 -.03 -.05 -.01 -.05
  ST.E       .16  .16  .16  .16  .16


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.404                +   IXXXX+XXXXX
 2  0.256               +    IXXXXXX
 3  0.270               +    IXXXXX+X
 4  0.167              +     IXXXX  +
 5  0.105              +     IXXX   +
 6  0.168              +     IXXXX  +
 7  0.115              +     IXXX   +
 8  0.188              +     IXXXXX +
 9  0.213              +     IXXXXX +
10  0.159              +     IXXXX  +
11  0.132             +      IXXX    +
12  0.128             +      IXXX    +
13  0.019             +      I       +
14  0.079             +      IXX     +
15  0.181             +      IXXXXX  +
16  0.008             +      I       +
17 -0.054             +     XI       +
18  0.016             +      I       +
19 -0.096             +    XXI       +
20 -0.156             +  XXXXI       +
21  0.023             +      IX      +
22 -0.032             +     XI       +
23 -0.050             +     XI       +
24 -0.007             +      I       +
25 -0.046             +     XI       +
PAGE  25     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ERASE       MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  26     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS
```

```
ACF          VARIABLE  IS GROUP2.
             MAXLAG IS 25.
             TIME=1,63./


NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =      155.7460
STANDARD ERROR OF THE MEAN        =        2.9388
T-VALUE OF MEAN (AGAINST ZERO)    =       52.9969


AUTOCORRELATIONS

  1-  8      .43  .27 -.08 -.14 -.22 -.28 -.19 -.28
  ST.E       .13  .15  .16  .16  .16  .16  .17  .17

  9- 12     -.12 -.06  .19  .21
  ST.E       .18  .18  .18  .19

 13- 20      .17  .13  .04 -.04 -.19 -.27 -.29 -.19
  ST.E       .19  .19  .19  .19  .19  .20  .20  .21

 21- 25     -.10  .01 -.04 -.03  .08
  ST.E        21   21   21   21   21

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.428              +     IXXXXX+XXXXX
 2  0.274             +      IXXXXXXXX
 3 -0.080            +     XXI       +
 4 -0.140            +    XXXI       +
 5 -0.217            +  XXXXXI       +
 6 -0.282            +XXXXXXXI       +
 7 -0.187            +  XXXXXI       +
 8 -0.279            +XXXXXXXI       +
 9 -0.116           +     XXXI        +
10 -0.061           +      XXI        +
11  0.192           +        IXXXXX . +
12  0.213           +        IXXXXX   +
13  0.168           +        IXXXX    +
14  0.134           +        IXXX     +
15  0.035           +        IX       +
16 -0.038           +       XI        +
17 -0.185           +   XXXXXI        +
18 -0.267          +  XXXXXXXI         +
19 -0.289          +  XXXXXXXI         +
```

```
20 -0.195          +    XXXXXI        +
21 -0.101          +      XXXI        +
22  0.008          +         I        +
23 -0.037          +        XI        +
24 -0.035          +        XI        +
25  0.080          +         IXX      +
PAGE  27     TIME SERIES ANALYSIS OF TOTAL MH ADMISSIONS
```

```
  PACF         VARIABLE  IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./
```

NUMBER OF OBSERVATIONS	=	63
MEAN OF THE (DIFFERENCED) SERIES	=	155.7460
STANDARD ERROR OF THE MEAN	=	2.9388
T-VALUE OF MEAN (AGAINST ZERO)	=	52.9969

PARTIAL AUTOCORRELATIONS

```
  1-  8     .43  .11 -.29 -.06 -.06 -.21  .01 -.22
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12    -.01  .03  .14  .02
  ST.E      .13  .13  .13  .13

 13- 20    -.09  .04  0.0 -.11 -.11 -.18 -.07  .03
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 13- 24    -.06 -.06 -.25 -.16 .09
  ST.E      .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.428              +     IXXXXX+XXXXX
 2  0.111              +     IXXX  +
 3 -0.289             X+XXXXXI     +
 4 -0.059              +   XI      +
 5 -0.061              +  XXI      +
 6 -0.206              +XXXXXI     +
 7  0.011              +     I     +
 8 -0.224              XXXXXXI     +
```

```
 9 -0.014             +     I     +
10  0.027             +     IX    +
11  0.144             +     IXXXX +
12  0.016             +     I     +
13 -0.094             +   XXI     +
14  0.036             +     IX    +
15 -0.000             +     I     +
16 -0.110             +  XXXI     +
17 -0.113             +  XXXI     +
18 -0.184             +XXXXXI     +
19 -0.065             +   XXI     +
20  0.030             +     IX    +
21 -0.062             +   XXI     +
22 -0.057             +    XI     +
23 -0.248             XXXXXXI     +
24 -0.165             + XXXXI     +
25  0.088             +     IXX   +
PAGE  28     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ACF         VARIABLE  IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./


NUMBER OF OBSERVATIONS             =          62
MEAN OF THE (DIFFERENCED) SERIES =       -0.4839
STANDARD ERROR OF THE MEAN         =      3.1687
T-VALUE OF MEAN (AGAINST ZERO)     =     -0.1527


AUTOCORRELATIONS

  1-  8     -.38  .17 -.24  .05 -.03 -.14  .17 -.23
  ST.E       .13  .14  .15  .15  .15  .15  .16  .16

  9- 12      .08 -.15  .19  .08
  ST.E       .16  .16  .17  .17

 13- 20     -.05  .07 -.02  .06 -.06 -.04 -.10  0.0
  ST.E       .17  .17  .17  .17  .17  .17  .17  .17

 21- 25     -.02  .14 -.04 -.11  0.0
  ST.E       .17  .17  .17  .17  .18


PLOT OF SERIAL CORRELATION

LAG CORR
```

```
         -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
           +----+----+----+----+----+----+----+----+----+----+
                                    I
        1 -0.376           XXX+XXXXXI     +
        2  0.167             +      IXXXX  +
        3 -0.236             +XXXXXXI      +
        4  0.046             +      IX     +
        5 -0.029            +      XI       +
        6 -0.139            +    XXXI       +
        7  0.167            +       IXXXX   +
        8 -0.228            + XXXXXXI       +
        9  0.082            +       IXX     +
       10 -0.154            +   XXXXI       +
       11  0.189            +       IXXXXX  +
       12  0.079            +       IXX     +
       13 -0.046            +      XI       +
       14  0.070            +       IXX     +
       15 -0.023            +      XI       +
       16  0.063            +       IXX     +
       17 -0.064            +     XXI       +
       18 -0.039            +      XI       +
       19 -0.096            +     XXI       +
       20 -0.001            +       I       +
       21 -0.016            +       I       +
       22  0.136            +       IXXX    +
       23 -0.041           +       XI        +
       24 -0.111           +     XXXI        +
       25  0.000           +        I        +
       PAGE  29     TIME SERIES ANALYSIS OF
                    TOTAL MH ADMISSIONS

         PACF        VARIABLE  IS GROUP2.
                     DFORDER IS 1.
                     MAXLAG IS 25.
                     TIME=1,63./


       NUMBER OF OBSERVATIONS           =               62
       MEAN OF THE (DIFFERENCED) SERIES =          -0.4839
       STANDARD ERROR OF THE MEAN       =           3.1687
       T-VALUE OF MEAN (AGAINST ZERO)   =          -0.1527


       PARTIAL AUTOCORRELATIONS

         1-  8     -.38  .03 -.19 -.13 -.04 -.24  .02 -.21
         ST.E       .13  .13  .13  .13  .13  .13  .13  .13

         9- 12     -.20 -.23 -.09  .07
         ST.E       .13  .13  .13  .13
```

```
 13- 20    -.08 -.04  .07  .03  .06 -.06 -.15 -.02
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 13- 24    -.04  .14  .01 -.25 -.14
  ST.E      .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0:6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.376           XXX+XXXXXI     +
 2  0.031              +     IX    +
 3 -0.190              +XXXXXI     +
 4 -0.125              +  XXXI     +
 5 -0.036              +    XI     +
 6 -0.238              XXXXXXI     +
 7  0.025              +     IX    +
 8 -0.206              +XXXXXI     +
 9 -0.205              +XXXXXI     +
10 -0.228              XXXXXXI     +
11 -0.087              +   XXI     +
12  0.072              +     IXX   +
13 -0.083              +   XXI     +
14 -0.040              +    XI     +
15  0.069              +     IXX   +
16  0.034              +     IX    +
17  0.064              +     IXX   +
18 -0.059              +    XI     +
19 -0.152              + XXXXI     +
20 -0.022              +    XI     +
21 -0.042              +    XI     +
22  0.139              +     IXXX  +
23  0.009              +     I     +
24 -0.246              XXXXXXI     +
25 -0.135              +  XXXI     +
PAGE  30     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ARIMA       VARIABLE IS GROUP2.
              DFORDER IS 1.
              ARORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
```

PAGE 31 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ESTIMATION RESIDUAL IS RGROUP2.
TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^1)$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	AR	1	1	-0.3767	0.1195	-3.15

RESIDUAL SUM OF SQUARES = 32423.089844
DEGREES OF FREEDOM = 60
RESIDUAL MEAN SQUARE = 540.384766

PAGE 32 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^1)$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	AR	1	1	-0.3786

```
                                  ST  ERR   T-RATIO
                                  0.1191     -3.18

RESIDUAL SUM OF SQUARES  =     32423.242188
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                60
RESIDUAL MEAN SQUARE     =       540.387207
PAGE  33     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ACF         VARIABLE IS RGROUP2.
              MAXLAG IS 25.
              TIME=1,63./


NUMBER OF OBSERVATIONS             =             63
MEAN OF THE (DIFFERENCED) SERIES =          -0.6247
STANDARD ERROR OF THE MEAN         =          2.8873
T-VALUE OF MEAN (AGAINST ZERO)     =         -0.2163


AUTOCORRELATIONS

  1- 8      .01 -.04 -.21 -.06 -.09 -.13  .07 -.19
  ST.E      .13  .13  .13  .13  .13  .13  .13  .14

  9- 12    -.06 -.09  .21  .17
  ST.E      .14  .14  .14  .15

 13- 20     0.0  .07  .03  .05 -.08 -.12 -.14 -.06
  ST.E      .15  .15  .15  .15  .15  .15  .15  .15

 21- 25     .04  .15 -.04 -.16 -.06
  ST.E      .15  .15  .16  .16  .16


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1  0.011               +     I     +
 2 -0.041               +    XI     +
 3 -0.208               +XXXXXI     +
 4 -0.056               +    XI     +
 5 -0.088               +   XXI     +
 6 -0.127              +   XXXI      +
 7  0.066              +      IXX    +
 8 -0.193              + XXXXXI      +
```

```
 9 -0.061            +    XXI       +
10 -0.088            +    XXI       +
11  0.212            +      IXXXXX  +
12  0.173            +      IXXXX   +
13 -0.002            +      I       +
14  0.074            +      IXX     +
15  0.029            +      IX      +
16  0.047            +      IX      +
17 -0.078            +    XXI       +
18 -0.121            +   XXXI       +
19 -0.142            +  XXXXI       +
20 -0.056           +      XI        +
21  0.037           +       IX       +
22  0.150           +       IXXXX    +
23 -0.040           +      XI        +
24 -0.164           +   XXXXI        +
25 -0.056           +      XI        +
PAGE  34     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  35     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               ARORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  36     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
```

```
INPUT  VARIABLE = NOISE    I1
PAGE  37     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  INDEP       VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2
PAGE  38     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP2     RANDOM               1-  84  (1-B  )
                                                1
I1         BINARY               1-  84  (1-B  )
                                                1
I2         BINARY               1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2       AR       1      1    -0.3624
      2  I1           UP       1      0    24.3798
      3  I2           UP       1      0     0.7044

                                ST  ERR   T-RATIO
                                 0.1072     -3.38
                                21.5724      1.13
                                22.0475      0.03

RESIDUAL SUM OF SQUARES  =     41497.527344
```

```
DEGREES OF FREEDOM        =              79
RESIDUAL MEAN SQUARE      =        525.285156
PAGE  39      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                             1
GROUP2     RANDOM             1-  84  (1-B   )
                                             1
I1         BINARY             1-  84  (1-B   )
                                             1
I2         BINARY             1-  84  (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2        AR      1       1     -0.3642
      2  I1            UP      1       0     24.4176
      3  I2            UP      1       0      0.7591

                                 ST  ERR   T-RATIO
                                  0.1069     -3.41
                                 21.5813      1.13
                                 22.0387      0.03

RESIDUAL SUM OF SQUARES  =     41497.613281
                              (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =              79
RESIDUAL MEAN SQUARE     =        525.286133
PAGE  40      TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./


NUMBER OF OBSERVATIONS             =           84
MEAN OF THE (DIFFERENCED) SERIES =        -0.8170
STANDARD ERROR OF THE MEAN         =         2.4429
T-VALUE OF MEAN (AGAINST ZERO)     =        -0.3344
```

AUTOCORRELATIONS

```
  1- 8     -.03 -.12 -.13  0.0 -.12 -.15  .07 -.16
  ST.E      .11  .11  .11  .11  .11  .11  .12  .12

  9- 12    -.01 -.07  .21  .16
  ST.E      .12  .12  .12  .12

 13- 20    -.03 -.05  .01  .13 -.08 -.20 -.06  .06
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.06  .12  .02 -.07 -.07
  ST.E      .13  .13  .13  .13  .14
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.026                + XI    +
 2 -0.118                + XXXI   +
 3 -0.126                + XXXI   +
 4  0.000               +     I     +
 5 -0.123               +  XXXI     +
 6 -0.147               + XXXXI     +
 7  0.072               +     IXX   +
 8 -0.159               + XXXXI     +
 9 -0.015               +     I     +
10 -0.067               +   XXI     +
11  0.211               +     IXXXXX+
12  0.158               +     IXXXX +
13 -0.028               +    XI     +
14 -0.053               +    XI     +
15  0.007               +     I     +
16  0.132               +     IXXX  +
17 -0.083               +   XXI     +
18 -0.195               +XXXXXI     +
19 -0.058               +    XI     +
20  0.056              +      IX      +
21 -0.061              +    XXI       +
22  0.116              +      IXXX    +
23  0.023              +      IX      +
24 -0.071              +    XXI       +
25 -0.072              +    XXI       +
PAGE  41    TIME SERIES ANALYSIS OF
            TOTAL MH ADMISSIONS

  ERASE       MODEL./
```

```
UNIVARIATE TIME SERIES MODEL ERASED
PAGE  42      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               ARORDER IS '(1)'./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  43      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  44      TIME SERIES ANALYSIS OF TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1        I2
PAGE  45      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
```

```
             TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  46      TIME SERIES ANALYSIS OF
              TOTAL MH ADMISSIONS

  ESTIMATION  RÈSIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                                1
GROUP2       RANDOM              1-  84  (1-B   )
                                                1
I1           BINARY              1-  84  (1-B   )
                                                1
I2           BINARY              1-  84  (1-B   )
                                                1
CLOSE        BINARY              1-  84  (1-B   )


PARAMETER VARIABLE     TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2         AR      1       1     -0.4221
      2  I1             UP      1       0     24.2213
      3  I2             UP      1       0      1.5449
      4  CLOSE          UP      1       0    -62.0430

                                  ST  ERR   T-RATIO
                                   0.1062     -3.97
                                  20.1414      1.20
                                  20.5847      0.08
                                  20.3519     -3.05

RESIDUAL SUM OF SQUARES  =      37133.109375
DEGREES OF FREEDOM       =                78
RESIDUAL MEAN SQUARE     =        476.065430
PAGE  47      TIME SERIES ANALYSIS OF
```

TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	AR	1	1	-0.4239	0.1058	-4.01
2	I1	UP	1	0	24.2278	20.1350	1.20
3	I2	UP	1	0	1.6067	20.5782	0.08
4	CLOSE	UP	1	0	-62.0838	20.3431	-3.05

RESIDUAL SUM OF SQUARES = 37133.281250
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 78
RESIDUAL MEAN SQUARE = 476 067627
PAGE 48 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ACF VARIABLE IS IGROUP2.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.1989
STANDARD ERROR OF THE MEAN = 2.3126
T-VALUE OF MEAN (AGAINST ZERO) = 0.0860

```
AUTOCORRELATIONS

  1- 8     -.02 -.10 -.12 -.06 -.13 -.11  .05 -.17
  ST.E      .11  .11  .11  .11  .11  .11  .12  .12

  9- 12    -.08 -.03  .20  .19
  ST.E      .12  .12  .12  .12

 13- 20     .01  .04 -.02  .06 -.05 -.18 -.10  .02
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     0.0  .09  .05  .05 -.04
  ST.E      .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                                 I
 1 -0.022                  +   XI    +
 2 -0.098                  +  XXI    +
 3 -0.118                  + XXXI    +
 4 -0.055                  +   XI    +
 5 -0.131                  + XXXI    +
 6 -0.114                 +  XXXI     +
 7  0.052                 +     IX    +
 8 -0.171                 + XXXXI     +
 9 -0.081                 +   XXI     +
10 -0.033                 +    XI     +
11  0.205                 +     IXXXXXX+
12  0.189                 +     IXXXXX+
13  0.011                 +     I     +
14  0.036                 +     IX    +
15 -0.023                 +    XI     +
16  0.059                 +     IX    +
17 -0.047                 +    XI     +
18 -0.184                 +XXXXXI     +
19 -0.100                 +   XXI     +
20  0.015                 +     I     +
21  0.003                 +     I     +
22  0.094                 +     IXX   +
23  0.046                 +     IX    +
24  0.049                 +     IX    +
25 -0.042                +     XI      +
PAGE  49     TIME SERIES ANALYSIS OF
             TOTAL MH ADMISSIONS

  ERASE        MODEL./
```

UNIVARIATE TIME SERIES MODEL ERASED
PAGE 50 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

```
  ACF          VARIABLE  IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./
```

```
NUMBER OF OBSERVATIONS            =          63
MEAN OF THE (DIFFERENCED) SERIES =      80.7301
STANDARD ERROR OF THE MEAN        =       1.8732
T-VALUE OF MEAN (AGAINST ZERO)    =      43.0964
```

AUTOCORRELATIONS

```
  1- 8      .34  .26  .04  .01 -.12 -.26 -.17 -.14
  ST.E      .13  .14  .15  .15  .15  .15  .16  .16

  9- 12    -.04  .05  .01  .09
  ST.E      .16  .16  .16  .16

 13- 20    -.02  .19  .06  .03  .06  .04  .01 -.17
  ST.E      .16  .16  .17  .17  .17  .17  .17  .17

 21- 25    -.12 -.05 -.08 -.03  .05
  ST.E      .17  .17  .17  .17  .17
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                                 I
 1  0.336                 +      IXXXXX+XX
 2  0.257                +       IXXXXXX+
 3  0.044                +       IX     +
 4  0.008                +       I      +
 5 -0.124                +    XXXI      +
 6 -0.256                +XXXXXXI       +
 7 -0.175               +   XXXXI        +
 8 -0.145               +   XXXXI        +
 9 -0.041               +      XI        +
10  0.046               +        IX      +
11  0.005               +        I       +
12  0.095               +        IXX     +
13 -0.025               +      XI        +
14  0.190               +        IXXXXX  +
15  0.057               +        IX      +
```

```
16  0.030            +       IX       +
17  0.061            +       IXX      +
18  0.040            +       IX       +
19  0.009            +       I        +
20 -0.169            +   XXXXI        +
21 -0.116            +    XXXI        +
22 -0.046            +      XI        +
23 -0.081            +     XXI        +
24 -0.033            +      XI        +
25  0.045            +       IX       +
PAGE  51     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  PACF         VARIABLE  IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =         80.7301
STANDARD ERROR OF THE MEAN          =        1.8732
T-VALUE OF MEAN (AGAINST ZERO)      =       43.0964


PARTIAL AUTOCORRELATIONS

  1-  8      .34  .16 -.10 -.03 -.12 -.21  0.0 -.01
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      .03  .09 -.09  .03
  ST.E       .13  .13  .13  .13

 13- 20     -.11  .20  0.0 -.05  .10  0.0 -.06 -.14
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.02  .10 -.04 -.02  .12
  ST.E       .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1  0.336             +      IXXXXX+XX
 2  0.162             +      IXXXX +
 3 -0.096             +    XXI     +
 4 -0.025             +     XI     +
 5 -0.121             +   XXXI     +
 6 -0.214             +XXXXXI      +
```

```
 7  0.002             +     I     +
 8 -0.005             +     I     +
 9  0.033             +     IX    +
10  0.088             +     IXX   +
11 -0.087             +   XXI     +
12  0.030             +     IX    +
13 -0.108             +  XXXI     +
14  0.202             +     IXXXXX+
15 -0.001             +     I     +
16 -0.050             +    XI     +
17  0.102             +     IXXX  +
18  0.001             +     I     +
19 -0.055             +    XI     +
20 -0.136             +  XXXI     +
21 -0.016             +     I     +
22  0.097             +     IXX   +
23 -0.038             +    XI     +
24 -0.018             +     I     +
25  0.124             +     IXXX  +
PAGE  52     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ARIMA       VARIABLE IS GROUP3.
              CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  53     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS RGROUP3.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN     TIME     DIFFERENCES

GROUP3     RANDOM            1-  84
```

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	80.7301

ST ERR	T-RATIO
1.8733	43.10

RESIDUAL SUM OF SQUARES = 13706.339844
DEGREES OF FREEDOM = 62
RESIDUAL MEAN SQUARE = 221.069992
PAGE 54 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	80.7301

ST ERR	T-RATIO
1.8733	43.10

RESIDUAL SUM OF SQUARES = 13706.339844
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 62
RESIDUAL MEAN SQUARE = 221.069992
PAGE 55 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ACF VARIABLE IS RGROUP3.
MAXLAG IS 25.
TIME=1,63./

NUMBER OF OBSERVATIONS = 63
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 1.8732
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

```
AUTOCORRELATIONS

  1-  8      .34  .26  .04  .01 -.12 -.26 -.17 -.14
  ST.E       .13  .14  .15  .15  .15  .15  .16  .16

  9- 12     -.04  .05  .01  .09
  ST.E       .16  .16  .16  .16

 13- 20     -.02  .19  .06  .03  .06  .04  .01 -.17
  ST.E       .16  .16  .17  .17  .17  .17  .17  .17

 21- 25     -.12 -.05 -.08 -.03  .05
  ST.E       .17  .17  .17  .17  .17

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.336              +     IXXXXX+XX
 2  0.257             +      IXXXXXX+
 3  0.044             +      IX     +
 4  0.008             +      I      +
 5 -0.124             +   XXXI      +
 6 -0.256             +XXXXXXI      +
 7 -0.175            +   XXXXI       +
 8 -0.145            +   XXXXI       +
 9 -0.041            +      XI       +
10  0.046            +       IX      +
11  0.005            +       I       +
12  0.095            +       IXX     +
13 -0.025            +      XI       +
14  0.190            +       IXXXXX  +
15  0.057            +       IX      +
16  0.030            +       IX      +
17  0.061            +       IXX     +
18  0.040            +       IX      +
19  0.009            +       I       +
20 -0.169            +   XXXXI       +
21 -0.116            +    XXXI       +
22 -0.046            +      XI       +
23 -0.081            +     XXI       +
24 -0.033            +      XI       +
25  0.045            +       IX      +
PAGE  56     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ERASE        MODEL./
```

```
UNIVARIATE TIME SERIES MODEL ERASED
PAGE  57     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ARIMA       VARIABLE IS GROUP3.
              CONSTANT./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  58     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  INDEP       VARIABLE IS I1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  59     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  INDEP       VARIABLE IS I2.
              UPORDER IS '(0)'.
              TYPE IS BINARY./

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2
PAGE  60     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL
```

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	80.7301
2	I1	UP	1	0	-25.8968
3	I2	UP	1	0	-4.3889

ST ERR	T-RATIO
1.7950	44.97
4.4876	-5.77
6.2829	-0.70

RESIDUAL SUM OF SQUARES = 16442.195313
DEGREES OF FREEDOM = 81
RESIDUAL MEAN SQUARE = 202.990051
PAGE 61 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP3	MEAN	1	0	80.7301
2	I1	UP	1	0	-25.8968

```
     3  I2           UP      1      0    -4.3889

                                  ST  ERR   T-RATIO
                                   1.7950     44.97
                                   4.4877     -5.77
                                   6.2810     -0.70

RESIDUAL SUM OF SQUARES  =      16442.195313
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                81
RESIDUAL MEAN SQUARE     =        202.990051
PAGE  62     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ACF         VARIABLE IS IGROUP3.
              MAXLAG IS 25./


NUMBER OF OBSERVATIONS              =            84
MEAN OF THE (DIFFERENCED) SERIES =           0.0000
STANDARD ERROR OF THE MEAN          =        1.5357
T-VALUE OF MEAN (AGAINST ZERO)      =        0.0000


AUTOCORRELATIONS

  1-  8      .31  .20  .02 -.06 -.17 -.32 -.21 -.14
  ST.E       .11  .12  .12  .12  .12  .13  .14  .14

  9- 12      .02  .05  .03  .19
  ST.E       .14  .14  .14  .14

 13- 20      .06  .20  .04  .01  .02 -.05 -.10 -.20
  ST.E       .14  .14  .15  .15  .15  .15  .15  .15

 21- 25     -.08  .03  .03  .04  .12
  ST.E       .15  .15  .15  .15  .15

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.307               +    IXXXX+XXX
 2  0.205              +     IXXXXX+
 3  0.017              +     I     +
 4 -0.056              +    XI     +
 5 -0.170              + XXXXI     +
 6 -0.322            XX+XXXXXI     +
```

```
 7 -0.214          + XXXXXI      +
 8 -0.145          +  XXXXI      +
 9  0.020          +      IX     +
10  0.049          +      IX     +
11  0.026          +      IX     +
12  0.187          +      IXXXXX +
13  0.064          +      IXX    +
14  0.195          +      IXXXXX +
15  0.045          +      IX     +
16  0.012          +      I      +
17  0.016          +      I      +
18 -0.049          +     XI      +
19 -0.104          +   XXXI      +
20 -0.199          + XXXXXI      +
21 -0.078          +    XXI      +
22  0.034          +      IX     +
23  0.025          +      IX     +
24  0.038          +      IX     +
25  0.121         +       IXXX     +
PAGE  63     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  64     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  65     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
```

```
INPUT  VARIABLE = NOISE    I1
PAGE  66     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  67     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  INDEP        VARIABLE IS CLOSE.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2        CLOSE
PAGE  68     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ESTIMATION  RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2        CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP3     RANDOM              1-  84

I1         BINARY              1-  84

I2         BINARY              1-  84
```

CLOSE BINARY 1- 84

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	82.1667	1.6982	48.38
2	I1	UP	1	0	2.8332	8.4916	0.33
3	I2	UP	1	0	-4.3889	5.8018	-0.76
4	CLOSE	UP	1	0	-30.1666	7.7822	-3.88

RESIDUAL SUM OF SQUARES = 13842.125000
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 173.026550
PAGE 69 TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	82.1666	1.6982	48.38
2	I1	UP	1	0	2.8333		
3	I2	UP	1	0	-4.3889		
4	CLOSE	UP	1	0	-30.1666		

```
                                   8.4898      0.33
                                   5.8009     -0.76
                                   7.7823     -3.88

RESIDUAL SUM OF SQUARES  =      13842.117188
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                80
RESIDUAL MEAN SQUARE     =        173.026459
PAGE  70     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  ACF          VARIABLE IS IGROUP3.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS              =             84
MEAN OF THE (DIFFERENCED) SERIES =            0.0000
STANDARD ERROR OF THE MEAN          =         1.4090
T-VALUE OF MEAN (AGAINST ZERO)      =         0.0000


AUTOCORRELATIONS

  1- 8      .23  .23  .06 -.02 -.11 -.26 -.18 -.17
  ST.E      .11  .11  .12  .12  .12  .12  .13  .13

  9- 12    -.07  0.0 -.10  .08
  ST.E      .13  .13  .13  .14

 13- 20    -.08  .14 -.01 -.02  .03  .01 -.02 -.06
  ST.E      .14  .14  .14  .14  .14  .14  .14  .14

 21- 25     0.0  .14  .03  .11  .10
  ST.E      .14  .14  .14  .14  .14

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.234                +   IXXXX+X
 2  0.232               +    IXXXXXX
 3  0.060               +    IXX   +
 4 -0.025               +   XI     +
 5 -0.114               +  XXXI    +
 6 -0.261              X+XXXXXI    +
 7 -0.181               +XXXXXI    +
 8 -0.173               + XXXXI    +
 9 -0.074              +    XXI     +
```

```
10  0.003             +      I      +
11 -0.103             +   XXXI      +
12  0.081             +      IXX    +
13 -0.082             +    XXI      +
14  0.139             +      IXXX   +
15 -0.006             +      I      +
16 -0.020             +     XI      +
17  0.032             +      IX     +
18  0.011             +      I      +
19 -0.017             +      I      +
20 -0.065             +    XXI      +
21 -0.005             +      I      +
22  0.142             +      IXXXX  +
23  0.025             +      IX     +
24  0.115             +      IXXX   +
25  0.103             +      IXXX   +
PAGE  71     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

  END./

NUMBER OF INTEGER WORDS OF STORAGE USED
IN PRECEDING    PROBLEM    2342
CPU TIME USED       6 704 SECONDS
PAGE  72     TIME SERIES ANALYSIS OF
TOTAL MH ADMISSIONS

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
 OCTOBER  2, 1982  AT 13:30:20


PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED
```

Output For Total Alcohol And Drug Admissions

```
PAGE   1

BMDP2T -  BOX-JENKINS TIME SERIES PROGRAM
DEPARTMENT OF BIOMATHEMATICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES, CA 90024
(213) 825-5940           TWX  UCLA LSA
PROGRAM REVISED JUNE 1981
MANUAL REVISED -- 1981
COPYRIGHT (C) 1981 REGENTS OF UNIVERSITY OF CALIFORNIA
 OCTOBER  2, 1982  AT 13:27:25

TO SEE REMARKS AND A SUMMARY OF NEW FEATURES FOR
THIS PROGRAM, STATE NEWS  IN THE PRINT PARAGRAPH


PROGRAM CONTROL INFORMATION

/ PRINT         PAGESIZE=0.
/ PROBLEM       TITLE IS 'TIME SERIES ANALYSIS OF
                TOTAL AD ADMISSIONS
                BY GROUPS'.
/ INPUT         VARIABLES ARE 9.
                FORMAT IS '(6F3 0,3F2 0)'.
/ VARIABLE      NAMES = G1AD1ST,G2AD1ST,G3AD1ST,
                G1ADREAD,G2ADREAD,G3ADREAD,
                I1,I2,CLOSE,GROUP1,GROUP2,GROUP3.
                ADD =  3.
/ TRANSFORM     GROUP1 = G1AD1ST + G1ADREAD.
                GROUP2 = G2AD1ST + G2ADREAD.
                GROUP3 = G3AD1ST + G3ADREAD.
/ SAVE          NEW. UNIT=3. CODE=TEMP.
/ END
PROBLEM TITLE IS
TIME SERIES ANALYSIS OF TOTAL AD ADMISSIONS  BY GROUPS

NUMBER OF VARIABLES TO READ IN                           9
NUMBER OF VARIABLES ADDED BY TRANSFORMATIONS             3
TOTAL NUMBER OF VARIABLES                               12
NUMBER OF CASES TO READ IN                          TO END
CASE LABELING VARIABLES
MISSING VALUES CHECKED BEFORE OR AFTER TRANS       NEITHER
BLANKS ARE                                         MISSING
INPUT UNIT NUMBER                                        5
REWIND INPUT UNIT PRIOR TO READING    DATA              NO
NUMBER OF WORDS OF DYNAMIC STORAGE                   45054
NUMBER OF CASES DESCRIBED BY INPUT FORMAT                1
```

```
***** TRAN     PARAGRAPH IS USED *****

VARIABLES TO BE USED
     1 G1AD1ST       2 G2AD1ST       3 G3AD1ST
     4 G1ADREAD      5 G2ADREAD      6 G3ADREAD
     7 I1            8 I2            9 CLOSE
    10 GROUP1       11 GROUP2       12 GROUP3
INPUT FORMAT IS
(6F3.0,3F2.0)
MAXIMUM LENGTH DATA RECORD IS   24 CHARACTERS
I N P U T   V A R I A B L E S
   VARIABLE      RECORD   COLUMNS     FIELD  TYPE
 INDEX   NAME      NO   BEGIN  END    WIDTH
 ----- --------  ----  ----- -----  -----   ----
     1 G1AD1ST      1      1     3      3     F
     2 G2AD1ST      1      4     6      3     F
     3 G3AD1ST      1      7     9      3     F
     4 G1ADREAD     1     10    12      3     F
     5 G2ADREAD     1     13    15      3     F
     6 G3ADREAD     1     16    18      3     F
     7 I1           1     19    20      2     F
     8 I2           1     21    22      2     F
     9 CLOSE        1     23    24      2     F


------------------------------------------
BMDP FILE IS BEING WRITTEN ON UNIT       3
CODE.     IS     TEMP
CONTENT   IS     DATA
LABEL     IS
  OCTOBER  2, 1982      13:27:25
VARIABLES ARE
     1 G1AD1ST       2 G2AD1ST       3 G3AD1ST
     4 G1ADREAD      5 G2ADREAD      6 G3ADREAD
     7 I1            8 I2            9 CLOSE
    10 GROUP1       11 GROUP2       12 GROUP3
BASED ON INPUT FORMAT SUPPLIED
1 RECORDS READ PER CASE

NUMBER OF CASES READ                       84


BMDP   FILE ON UNIT  3 HAS BEEN COMPLETED
------------------------------------------
NUMBER OF CASES WRITTEN TO FILE       84
PAGE   2     TIME SERIES ANALYSIS OF TOTAL
             AD ADMISSIONS  BY GROUPS


  TPLOT       VARIABLES ARE GROUP1, GROUP2, GROUP3.
```

```
              COMMON./

SYMBOL FOR VARIABLE GROUP1    IS    A
SYMBOL FOR VARIABLE GROUP2    IS    B
SYMBOL FOR VARIABLE GROUP3    IS    C

     7.50      22.5      37.5      52.5      67.5
          15.0      30.0      45.0      60.0      75
     .-+----+----+----+----+----+----+----+----+----+
     I         A    BC
     I        AC       B
     I               * B
     I             A     *
   5 +                AC   B
     I           A       C   B
     I       C    A  B
     I         C B   A
     I       C A             B
  10 +     A         *
     I      C  AB
     I   A   C     B
     I            B  A        C
     I           C A   B
  15 +       C         A           B
     I            C         BA
     I       C               A   B
     I        C       A     B
     I           A B       C
  20 +         A      B  C
     I          C AB
     I             A  B C
     I            A  BC
     I       C   A    B
  25 +              C        A   B
     I           C       A       B
     I              C             AB
     I         C              A      B
     I             C A            B
  30 +           C         A                   B
     I        C             A       B
     I          C     A    B
     I       C    AB
     I         C A B
  35 +   C    AB
     I   C A    B
     I                 C     A B
     I                  C A          B
     I                    C    A B
  40 +                C      A         B
     I                 C            A B
```

```
   I                    AC               B
   I         C        A                 B
   I              C  A                          B
45 +                    C  A           B
   I          C     A          B
   I            C    A               B
   I            C        A            B
   I            C        A         B
50 +        C          A   B
   I              AC                  B
   I         C          A      B
   I             C     A                         B
   I      C          A                       B
55 +                C            A       B
   I                 C   A             B
   I                C         A         B
   I           C        A             B
   I               A   C                    B
60 +          C        A                  B
   I   C        AB
   IC            A         B
   I   C               A           B
   I     C      A                  B
65 +         C       A      B
   I     C   A              B
   I           C      A                  B
   I      C         A             B
   I      AC               B
70 +    C       A              B
   I          C  A       B
   I     C     A       B
   I               C   A             B
   I   C          A          B
75 +     C       A                        B
   I   C           A                 B
   I     C          A     B
   I  C             A            B
   I   C          A                B
80 +           *                       B
   I             C   A         B
   I             *                     B
   I      C    A          B
   I   C    A         B
PAGE    3     TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS


  ACF          VARIABLE  IS GROUP1.
               MAXLAG IS 25.
               TIME=1,63./
```

```
NUMBER OF OBSERVATIONS             =           63
MEAN OF THE (DIFFERENCED) SERIES =        30.6984
STANDARD ERROR OF THE MEAN         =        1.1415
T-VALUE OF MEAN (AGAINST ZERO)     =       26.8941
```

AUTOCORRELATIONS

```
  1- 8       .55  .39  .20  0.0 -.10 -.14 -.07  .07
  ST.E       .13  .16  .17  .18  .18  .18  .18  .18

  9- 12      .13  .29  .29  .28
  ST.E       .18  .18  .19  .20

 13- 20      .19  .23  .11  .03 -.03 -.05 -.20 -.17
  ST.E       .20  .21  .21  .21  .21  .21  .21  .21

 21- 25     -.16 -.01  .06  .09  .07
  ST.E       .22  .22  .22  .22  .22
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.548              +     IXXXXX+XXXXXXXX
 2  0.387            +       IXXXXXXX+XX
 3  0.204           +        IXXXXX   +
 4 -0.001           +        I        +
 5 -0.101           +     XXXI        +
 6 -0.141           +    XXXXI        +
 7 -0.072           +      XXI        +
 8  0.071           +        IXX      +
 9  0.128           +        IXXX     +
10  0.290           +        IXXXXXXX +
11  0.286           +        IXXXXXXX +
12  0.276          +         IXXXXXXX  +
13  0.191          +         IXXXXX    +
14  0.234          +         IXXXXXX   +
15  0.108          +         IXXX      +
16  0.032          +         IX        +
17 -0.029          +        XI         +
18 -0.054          +        XI         +
19 -0.196          +    XXXXXI         +
20 -0.166          +     XXXXI         +
21 -0.162         +      XXXXI          +
22 -0.013         +          I          +
23  0.055         +          IX         +
24  0.090         +          IXX        +
```

```
25  0.066           +           IXX        +
PAGE   4     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  PACF          VARIABLE  IS GROUP1.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS              =             63
MEAN OF THE (DIFFERENCED) SERIES =          30.6984
STANDARD ERROR OF THE MEAN          =         1.1415
T-VALUE OF MEAN (AGAINST ZERO)      =        26.8941


PARTIAL AUTOCORRELATIONS

  1- 8       .55  .12 -.07 -.18 -.07 -.01  .11  .18
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12      .03  .18  0.0  .04
  ST.E       .13  .13  .13  .13

 13- 20     -.03  .23 -.05 -.03 -.07 -.03 -.25 -.03
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.06  .13  .03 -.11 -.17
  ST.E       .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.548               +    IXXXXX+XXXXXXXX
 2  0.125               +    IXXX  +
 3 -0.073               +  XXI     +
 4 -0.178               + XXXXI    +
 5 -0.071               +  XXI     +
 6 -0.007               +    I     +
 7  0.109               +    IXXX  +
 8  0.178               +    IXXXX +
 9  0.029               +    IX    +
10  0.180               +    IXXXX +
11  0.005               +    I     +
12  0.042               +    IX    +
13 -0.028               +   XI     +
```

```
14  0.233               +     IXXXXXX
15 -0.047               +    XI      +
16 -0.033               +    XI      +
17 -0.065               +   XXI      +
18 -0.026               +    XI      +
19 -0.251              XXXXXXI       +
20 -0.029               +    XI      +
21 -0.060               +    XI      +
22  0.126               +     IXXX   +
23  0.028               +     IX     +
24 -0.106               +  XXXI      +
25 -0.168               + XXXXI      +
PAGE   5     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  ACF          VARIABLE IS GROUP1.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =             62
MEAN OF THE (DIFFERENCED) SERIES =            0.2419
STANDARD ERROR OF THE MEAN          =         1.0866
T-VALUE OF MEAN (AGAINST ZERO)      =         0.2227


AUTOCORRELATIONS

  1-  8     -.33  .05  .01 -.10 -.09 -.13 -.07  .06
  ST.E       .13  .14  .14  .14  .14  .14  .14  .15

  9- 12     - 12   20 - 02   14
  ST.E        15   15   15   15

 13- 20     -.16  .21 -.04 -.01 -.06  .10 -.20  .04
  ST.E        15   16   16   16   16   16   16   17

 21- 25     -.16  .07  .04  .11  .01
  ST.E       .17  .17  .17  .17  .17


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                                 I
 1 -0.329             XX+XXXXXI      +
```

```
 2  0.053          +      IX     +
 3  0.006          +      I      +
 4 -0.101          +   XXXI      +
 5 -0.095          +    XXI      +
 6 -0.132          +   XXXI      +
 7 -0.066          +    XXI      +
 8  0.062          +      IXX    +
 9 -0.118          +   XXXI      +
10  0.201          +      IXXXXXX +
11 -0.016          +      I      +
12  0.135          +      IXXX   +
13 -0.161         +   XXXXI       +
14  0.206         +       IXXXXXX +
15 -0.036         +      XI       +
16 -0.014         +       I       +
17 -0.063         +     XXI       +
18  0.102         +       IXXX    +
19 -0.196         +  XXXXXI       +
20  0.040         +       IX      +
21 -0.163         +   XXXXI       +
22  0.071         +       IXX     +
23  0.041         +       IX      +
24  0.108         +       IXXX    +
25  0.010         +       I       +
PAGE    6      TIME SERIES ANALYSIS OF TOTAL AD
               ADMISSIONS  BY GROUPS


  PACF          VARIABLE IS GROUP1.
                DFORDER IS 1.
                MAXLAG IS 25.
                TIME=1,63./


NUMBER OF OBSERVATIONS               =            62
MEAN OF THE (DIFFERENCED) SERIES =          0.2419
STANDARD ERROR OF THE MEAN           =        1.0866
T-VALUE OF MEAN (AGAINST ZERO)      =        0.2227


PARTIAL AUTOCORRELATIONS

  1-  8     -.33 -.06  0.0 -.11 -.18 -.27 -.27 -.13
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.27 -.09 -.15 -.04
  ST.E       .13  .13  .13  .13

 13- 20     -.33 -.08 -.05  .01 -.06  .16 -.03  .04
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13
```

```
 21- 25     -.13 -.10  .05  .16  .09
  ST.E        .13  .13  .13  .13  .13


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1 -0.329               XX+XXXXXI     +
 2 -0.062                 +   XXI     +
 3  0.005                 +     I     +
 4 -0.105                 +  XXXI     +
 5 -0.185                 +XXXXXI     +
 6 -0.266                X+XXXXXI     +
 7 -0.266                X+XXXXXI     +
 8 -0.126                 +  XXXI     +
 9 -0.274                X+XXXXXI     +
10 -0.088                 +   XXI     +
11 -0.151                 + XXXXI     +
12 -0.042                 +    XI     +
13 -0.332               XX+XXXXXI     +
14 -0.077                 +   XXI     +
15 -0.051                 +    XI     +
16  0.012                 +     I     +
17 -0.056                 +    XI     +
18  0.156                 +     IXXXX +
19 -0.027                 +    XI     +
20  0.045                 +     IX    +
21 -0.128                 +  XXXI     +
22 -0.096                 +   XXI     +
23  0.053                 +     IX    +
24  0.155                 +     IXXXX +
25  0.088                 +     IXX   +
PAGE   7      TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS


  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               ARORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE   8      TIME SERIES ANALYSIS OF TOTAL AD
```

ADMISSIONS BY GROUPS

```
ESTIMATION  RESIDUAL IS RGROUP1.
            TIME=1,63./
```

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN EACH ESTIMATE LESS THAN
0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

```
VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                           1
GROUP1     RANDOM             1-  84   (1-B  )
```

```
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP1        AR      1       1    -0.3343

                                  ST  ERR   T-RATIO
                                   0.1229     -2.72
```

```
RESIDUAL SUM OF SQUARES  =      3974.542969
DEGREES OF FREEDOM       =               60
RESIDUAL MEAN SQUARE     =        66.242371
PAGE   9      TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS
```

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE

```
VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                           1
GROUP1     RANDOM             1-  84   (1-B  )
```

```
PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
     1  GROUP1        AR      1       1    -0.3346

                                   ST  ERR   T-RATIO
                                    0.1228     -2.72

RESIDUAL SUM OF SQUARES  =      3974.544189
                                (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               60
RESIDUAL MEAN SQUARE     =        66.242401
PAGE  10      TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS


  ACF          VARIABLE IS RGROUP1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS            =           63
MEAN OF THE (DIFFERENCED) SERIES =        0.2829
STANDARD ERROR OF THE MEAN        =        1.0085
T-VALUE OF MEAN (AGAINST ZERO)    =        0.2806


AUTOCORRELATIONS

  1-  8     -.02 -.05  0.0 -.16 -.20 -.22 -.11  .01
  ST.E       .13  .13  .13  .13  .13  .13  .14  .14

  9- 12     -.06  .20  .11  .10
  ST.E       .14  .14  .15  .15

 13- 20     -.07  .19  .03 -.06 -.04  .03 -.20 -.08
  ST.E       .15  .15  .15  .15  .15  .15  .15  .16

 21- 25     -.16  .05  .11  .16  .06
  ST.E       .16  .16  .16  .16  .16

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.022               +    XI     +
 2 -0.054               +    XI     +
 3 -0.004               +     I     +
 4 -0.161               + XXXXI     +
 5 -0.198               +XXXXXI     +
```

```
 6 -0.221           +XXXXXXI      +
 7 -0.112           +   XXXI      +
 8  0.012           +      I      +
 9 -0.061           +    XXI      +
10  0.203           +      IXXXXX +
11  0.106           +      IXXX   +
12  0.099           +      IXX    +
13 -0.066           +    XXI      +
14  0.187           +      IXXXXX +
15  0.028           +      IX     +
16 -0.060           +     XI      +
17 -0.045          +      XI       +
18  0.035          +       IX      +
19 -0.198          +  XXXXXI       +
20 -0.083          +     XXI       +
21 -0.156          +   XXXXI       +
22  0.052          +       IX      +
23  0.113          +       IXXX    +
24  0.155          +       IXXXX   +
25  0.056          +       IX      +
PAGE   11     TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE   12     TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS


  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               ARORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE   13     TIME SERIES ANALYSIS OF TOTAL AD
              ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
```

```
THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE   14      TIME SERIES ANALYSIS OF TOTAL AD
               ADMISSIONS  BY GROUPS


  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1        I2
PAGE   15      TIME SERIES ANALYSIS OF TOTAL AD
               ADMISSIONS  BY GROUPS


  ESTIMATION  RESIDUAL IS IGROUP1./


ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
THAN 0.1000E-04


SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                              1
GROUP1      RANDOM            1-  84   (1-B   )
                                              1
I1          BINARY            1-  84   (1-B   )
                                              1
I2          BINARY            1-  84   (1-B   )


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP1        AR      1       1     -0.3827
      2  I1            UP      1       0     -5.3395
```

3	I2	UP	1	0	2.9976

ST ERR	T-RATIO
0.1046	-3.66
7.3394	-0.73
7.3132	0.41

RESIDUAL SUM OF SQUARES = 4833.988281
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 61.189713

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	AR	1	1	-0.3830
2	I1	UP	1	0	-5.3236
3	I2	UP	1	0	2.9997

ST ERR	T-RATIO
0.1045	-3.67
7.3324	-0.73
7.3066	0.41

RESIDUAL SUM OF SQUARES = 4833.980469
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 61.189621

```
  ACF          VARIABLE IS IGROUP1.
               MAXLAG IS 25./

NUMBER OF OBSERVATIONS             =           84
MEAN OF THE (DIFFERENCED) SERIES =         0.0394
STANDARD ERROR OF THE MEAN         =       0.8329
T-VALUE OF MEAN (AGAINST ZERO)     =       0.0473


AUTOCORRELATIONS

  1-  8     -.05 -.09  .03 -.17 -.13 -.22 -.11  .07
  ST.E       .11  .11  .11  .11  .11  .12  .12  .12

  9- 12     -.12  .27  .08  .02
  ST.E       .12  .12  .13  .13

 13- 20      0.0  .10  .05 -.03 -.10  .11 -.16 -.10
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14

 21- 25     -.15  .05  .13  .13  .02
  ST.E       .14  .14  .14  .14  .14

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.045                 +   XI    +
 2 -0.086                 +  XXI    +
 3  0.031                 +    IX   +
 4 -0.170                 +XXXXI    +
 5 -0.135              +  XXXI     +
 6 -0.224              XXXXXXI     +
 7 -0.113              +  XXXI     +
 8  0.072              +     IXX   +
 9 -0.118              +  XXXI     +
10  0.266              +     IXXXXX+X
11  0.081              +     IXX   +
12  0.019              +     I     +
13 -0.003              +     I     +
14  0.102              +     IXXX  +
15  0.050              +     IX    +
16 -0.031              +    XI     +
17 -0.098              +   XXI     +
18  0.107             +      IXXX    +
19 -0.159             +  XXXXI      +
20 -0.102             +   XXXI      +
```

```
21 -0.150            +  XXXXI      +
22  0.050            +      IX     +
23  0.127            +      IXXX   +
24  0.134            +      IXXX   +
25  0.024            +      IX     +
PAGE  18     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  19     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  ARIMA        VARIABLE IS GROUP1.
               DFORDER IS 1.
               ARORDER IS '(1)'./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE
PAGE  20     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1
PAGE  21     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./
```

```
THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2
PAGE   22      TIME SERIES ANALYSIS OF TOTAL AD
               ADMISSIONS  BY GROUPS


  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL .

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP1
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE   23      TIME SERIES ANALYSIS OF TOTAL AD
               ADMISSIONS  BY GROUPS


  ESTIMATION  RESIDUAL IS IGROUP1./



ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
THAN 0.1000E-04



SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                              1
GROUP1     RANDOM             1-  84   (1-B   )
                                              1
I1         BINARY             1-  84   (1-B   )
                                              1
I2         BINARY             1-  84   (1-B   )
                                              1
CLOSE      BINARY             1-  84   (1-B   )
```

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	AR	1	1	-0.3785
2	I1	UP	1	0	-5.3729
3	I2	UP	1	0	2.9999
4	CLOSE	UP	1	0	-7.3518

ST ERR	T-RATIO
0.1057	-3.58
7.3435	-0.73
7.3166	0.41
7.3305	-1.00

RESIDUAL SUM OF SQUARES = 4772.292969
DEGREES OF FREEDOM = 78
RESIDUAL MEAN SQUARE = 61.183243
PAGE 24 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS
THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP1
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP1	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP1	AR	1	1	-0.3787
2	I1	UP	1	0	-5.3707
3	I2	UP	1	0	2.9997
4	CLOSE	UP	1	0	-7.3505

ST ERR T-RATIO

```
                                   0.1056     -3.59
                                   7.3432     -0.73
                                   7.3163      0.41
                                   7.3302     -1.00

RESIDUAL SUM OF SQUARES  =      4772.296875
                                (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =              78
RESIDUAL MEAN SQUARE     =        61.183289
PAGE  25     TIME SERIES ANALYSIS OF TOTAL AD
             ADMISSIONS  BY GROUPS


  ACF         VARIABLE IS IGROUP1.
              MAXLAG IS 25./


NUMBER OF OBSERVATIONS              =          84
MEAN OF THE (DIFFERENCED) SERIES =        0.1604
STANDARD ERROR OF THE MEAN          =      0.8274
T-VALUE OF MEAN (AGAINST ZERO)      =      0.1939


AUTOCORRELATIONS

  1-  8    -.04 -.09  .02 -.17 -.15 -.19 -.12  .05
  ST.E      .11  .11  .11  .11  .11  .12  .12  .12

  9- 12    -.10  .27  .07  .03
  ST.E      .12  .12  .13  .13

 13- 20     0.0  .10  .04 -.02 -.10  .09 -.19 -.08
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25    -.15  .05  .13  .18 .03
  ST.E      .13  .14  .14  .14  .14


PLOT OF SERIAL CORRELATION

LAG CORR
 -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
   +----+----+----+----+----+----+----+----+----+----+
                                I
 1 -0.043                  +   XI    +
 2 -0.089                  +  XXI    +
 3  0.016                  +    I    +
 4 -0.167                  +XXXXI    +
 5 -0.152                 + XXXXI     +
 6 -0.189                 +XXXXXI     +
```

```
 7 -0.115             +  XXXI     +
 8  0.051             +     IX    +
 9 -0.102             +  XXXI     +
10  0.266             +     IXXXXX+X
11  0.070             +     IXX   +
12  0.034             +     IX    +
13  0.002             +     I     +
14  0.096             +     IXX   +
15  0.036             +     IX    +
16 -0.021             +    XI     +
17 -0.100             +   XXI     +
18  0.086             +     IXX   +
19 -0.190             +XXXXXI     +
20 -0.084            +    XXI      +
21 -0.153            +  XXXXI      +
22  0.048            +      IX     +
23  0.131            +      IXXX   +
24  0.178            +      IXXXX  +
25  0.029            +      IX     +
PAGE  26     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  27     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ACF          VARIABLE  IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS               =            63
MEAN OF THE (DIFFERENCED) SERIES =           43.4762
STANDARD ERROR OF THE MEAN           =         1.8405
T-VALUE OF MEAN (AGAINST ZERO)       =        23.6217


AUTOCORRELATIONS

  1- 8       .71  .54  .45  .31  .23  .18  .11  .08
  ST.E       .13  .18  .20  .22  .23  .23  .23  .23

  9- 12      .20  .28  .34  .36
  ST.E       .23  .24  .24  .25

 13- 20      .35  .30  .28  .19  .04 -.06 -.12 -.14
  ST.E       .26  .26  .27  .27  .28  .28  .28  .28
```

```
 21- 25     -.11 -.07 -.06 -.09 -.03
  ST.E       .28  .28  .28  .28  .28


PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.714              +     IXXXXX+XXXXXXXXXXXX
 2  0.540           +        IXXXXXXXX+XXXXX
 3  0.445          +         IXXXXXXXXX+X
 4  0.311         +          IXXXXXXXX  +
 5  0.228         +          IXXXXXX    +
 6  0.180         +          IXXXX      +
 7  0.114         +          IXXX       +
 8  0.081         +          IXX        +
 9  0.202         +          IXXXXX     +
10  0.277        +           IXXXXXXX    +
11  0.338        +           IXXXXXXXX   +
12  0.362        +           IXXXXXXXXX  +
13  0.345       +            IXXXXXXXXX   +
14  0.296       +            IXXXXXXX     +
15  0.283       +            IXXXXXXX     +
16  0.190       +            IXXXXX       +
17  0.038       +            IX           +
18 -0.064       +          XXI            +
19 -0.117      +          XXXI             +
20 -0.139      +          XXXI             +
21 -0.106      +          XXXI             +
22 -0.074      +           XXI             +
23 -0.063      +           XXI             +
24 -0.093      +           XXI             +
25 -0.025      +            XI             +
PAGE  28      TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  PACF         VARIABLE  IS GROUP2.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =            63
MEAN OF THE (DIFFERENCED) SERIES =          43.4762
STANDARD ERROR OF THE MEAN          =         1.8405
T-VALUE OF MEAN (AGAINST ZERO)    =          23.6217


PARTIAL AUTOCORRELATIONS
```

```
  1-  8     .71  .06  .08 -.10  .01  .02 -.04  .01
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     .30  .11  .12 -.01
  ST.E      .13  .13  .13  .13

 13- 20     0.0 -.06  .05 -.13 -.14 -.11 -.01 -.04
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     .03 -.04 -.01 -.22  .09
  ST.E      .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.714             +     IXXXXX+XXXXXXXXXXXX
 2  0.062             +     IXX   +
 3  0.080             +     IXX   +
 4 -0.096             +   XXI     +
 5  0.012             +     I     +
 6  0.015             +     I     +
 7 -0.038             +    XI     +
 8  0.011             +     I     +
 9  0.296             +     IXXXXX+X
10  0.110             +     IXXX  +
11  0.119             +     IXXX  +
12 -0.014             +     I     +
13 -0.003             +     I     +
14 -0.058             +    XI     +
15  0.050             +     IX    +
16 -0.131             +  XXXI     +
17 -0.142             + XXXXI     +
18 -0.112             +  XXXI     +
19 -0.010             +     I     +
20 -0.044             +    XI     +
21  0.030             +     IX    +
22 -0.036             +    XI     +
23 -0.013             +     I     +
24 -0.222             XXXXXXI     +
25  0.087             +     IXX   +
PAGE  29     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  ACF         VARIABLE  IS GROUP2.
              DFORDER IS 1.
              MAXLAG IS 25.
              TIME=1,63./
```

```
NUMBER OF OBSERVATIONS              =          62
MEAN OF THE (DIFFERENCED) SERIES =         0.4032
STANDARD ERROR OF THE MEAN          =      1.3806
T-VALUE OF MEAN (AGAINST ZERO)      =      0.2921
```

AUTOCORRELATIONS

```
  1-  8     -.18 -.13  .03 -.09 -.05  0.0 -.07 -.25
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14

  9- 12      .05  0.0  .11  .06
  ST.E       .14  .14  .14  .14

 13- 20      .09 -.04  .12  .12 -.10 -.14 -.07 -.10
  ST.E       .14  .15  .15  .15  .15  .15  .15  .15

 21- 25      .01  .04  .08 -.13  .08
  ST.E       .15  .15  .15  .15  .16
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1 -0.183               +XXXXXI      +
 2 -0.126                +  XXXI      +
 3  0.033              +      IX      +
 4 -0.092              +    XXI      +
 5 -0.049              +     XI      +
 6 -0.002              +      I      +
 7 -0.070              +    XXI      +
 8 -0.250              +XXXXXXI      +
 9  0.046              +      IX      +
10  0.002              +      I      +
11  0.107              +      IXXX    +
12  0.058              +      IX      +
13  0.095              +      IXX     +
14 -0.040              +     XI      +
15  0.117              +      IXXX    +
16  0.125              +      IXXX    +
17 -0.099              +    XXI      +
18 -0.137              +   XXXI      +
19 -0.065              +    XXI      +
20 -0.100              +    XXI      +
21  0.010             +       I        +
22  0.038             +       IX       +
23  0.077             +       IXX      +
24 -0.133             +    XXXI        +
```

```
25  0.081            +        IXX     +
PAGE  30     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  PACF         VARIABLE  IS GROUP2.
               DFORDER IS 1.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =             62
MEAN OF THE (DIFFERENCED) SERIES =            0.4032
STANDARD ERROR OF THE MEAN          =            1.3806
T-VALUE OF MEAN (AGAINST ZERO)      =            0.2921


PARTIAL AUTOCORRELATIONS

  1- 8      -.18 -.16 -.03 -.12 -.10 -.07 -.12 -.35
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

  9- 12     -.20 -.23 -.08 -.12
  ST.E       .13  .13  .13  .13

 13- 20      0.0 -.12  .04  .11  .05 -.10 -.05 -.13
  ST.E       .13  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.02 -.05  .16 -.10  .01
  ST.E       .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.183              +XXXXXI     +
 2 -0.164              + XXXXI     +
 3 -0.025              +    XI     +
 4 -0.118              +  XXXI     +
 5 -0.098              +   XXI     +
 6 -0.070              +   XXI     +
 7 -0.119              +  XXXI     +
 8 -0.352           XXX+XXXXXI     +
 9 -0.196              +XXXXXI     +
10 -0.232              XXXXXXI     +
11 -0.079              +   XXI     +
12 -0.117              +  XXXI     +
13 -0.004              +     I     +
14 -0.123              +  XXXI     +
```

```
15  0.041               +     IX    +
16  0.108               +     IXXX  +
17  0.048               +     IX    +
18 -0.096               +   XXI     +
19 -0.047               +    XI     +
20 -0.129               +  XXXI     +
21 -0.021               +    XI     +
22 -0.050               +    XI     +
23  0.161               +     IXXXX +
24 -0.101               +  XXXI     +
25  0.013               +     I     +
PAGE  31     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  ARIMA       VARIABLE IS GROUP2.
              DFORDER IS 1.
              CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  32     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  ESTIMATION  RESIDUAL IS RGROUP2.
              TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES
                                              1
GROUP2     RANDOM             1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2      TRND    1       0     0.4055

                                 ST  ERR   T-RATIO
                                  1.3802      0.29
```

```
RESIDUAL SUM OF SQUARES  =      7208.886719
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =       118.178467
PAGE  33     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                                1
GROUP2     RANDOM             1-  84  (1-B  )


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP2      TRND     1       0     0.4040

                                   ST  ERR   T-RATIO
                                    1.3805      0.29

RESIDUAL SUM OF SQUARES  =      7208.886719
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               61
RESIDUAL MEAN SQUARE     =       118.178467
PAGE  34     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ACF          VARIABLE IS RGROUP2.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =            62
MEAN OF THE (DIFFERENCED) SERIES =         -0.0007
STANDARD ERROR OF THE MEAN          =        1.3806
T-VALUE OF MEAN (AGAINST ZERO)      =       -0.0005


AUTOCORRELATIONS

  1-  8     -.18 -.13  .03 -.09 -.05  0.0 -.07 -.25
  ST.E       .13  .13  .13  .13  .13  .13  .13  .14
```

```
  9- 12      .05  0.0  .11  .06
  ST.E       .14  .14  .14  .14

 13- 20      .09 -.04  .12  .12 -.10 -.14 -.07 -.10
  ST.E       .14  .15  .15  .15  .15  .15  .15  .15

 21- 25      .01  .04  .08 -.13  .08
  ST.E       .15  .15  .15  .15  .16

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.183              +XXXXXI     +
 2 -0.126              +  XXXI     +
 3  0.033             +      IX     +
 4 -0.092             +    XXI      +
 5 -0.049             +     XI      +
 6 -0.002             +      I      +
 7 -0.070             +    XXI      +
 8 -0.250             +XXXXXXI      +
 9  0.046             +      IX     +
10  0.002             +      I      +
11  0.107             +      IXXX   +
12  0.058             +      IX     +
13  0.095             +      IXX    +
14 -0.040             +     XI      +
15  0.117             +      IXXX   +
16  0.125             +      IXXX   +
17 -0.099             +    XXI      +
18 -0.137             +   XXXI      +
19 -0.065             +    XXI      +
20 -0.100             +    XXI      +
21  0.010            +       I       +
22  0.038            +       IX      +
23  0.077            +       IXX     +
24 -0.133            +    XXXI       +
25  0.081            +       IXX     +
PAGE  35     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  ERASE        MODEL./

UNIVARIATE TIME SERIES MODEL ERASED
PAGE  36     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ARIMA        VARIABLE IS GROUP2.
```

```
              DFORDER IS 1.
              CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  37     TIME SERIES ANALYSIS OF
TOTAL AD ADMISSIONS  BY GROUPS

  INDEP       VARIABLE IS I1.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1
PAGE  38     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  INDEP       VARIABLE IS I2.
              DFORDER IS 1.
              UPORDER IS '(0)'.
              TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2
PAGE  39     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
```

INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	TRND	1	0	0.1780	1.2510	0.14
2	I1	UP	1	0	-0.1780	11.3385	-0.02
3	I2	UP	1	0	-8.1779	11.3384	-0.72

RESIDUAL SUM OF SQUARES = 10159.503906
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 126.993790

PAGE 40 TIME SERIES ANALYSIS OF TOTAL AD ADMISSIONS BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	TRND	1	0	0.1676
2	I1	UP	1	0	-0.1677
3	I2	UP	1	0	-8.1677

ST ERR	T-RATIO
1.2532	0.13
11.3389	-0.01
11.3387	-0.72

```
RESIDUAL SUM OF SQUARES  =     10159.503906
                             (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               80
RESIDUAL MEAN SQUARE     =       126.993790
PAGE  41     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./


NUMBER OF OBSERVATIONS               =            83
MEAN OF THE (DIFFERENCED) SERIES =             0.0051
STANDARD ERROR OF THE MEAN           =        1.2218
T-VALUE OF MEAN (AGAINST ZERO)       =        0.0042


AUTOCORRELATIONS

  1-  8     -.25 -.13  .08 -.08 -.03 -.05 -.02 -.16
  ST.E       .11  .12  .12  .12  .12  .12  .12  .12

  9- 12      .04 -.02  .09 -.02
  ST.E       .12  .12  .12  .12

 13- 20      .14 -.08  .06  .20 -.13 -.18 -.02  .03
  ST.E       .12  .13  .13  .13  .13  .13  .13  .13

 21- 25     -.16  .17  .08 -.15  .08
  ST.E       .13  .14  .14  .14  .14

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                                 I
 1 -0.247                  X+XXXXI    +
 2 -0.127                  +  XXXI     +
 3  0.085                  +     IXX   +
 4 -0.078                  +   XXI     +
 5 -0.031                  +    XI     +
 6 -0.053                  +    XI     +
 7 -0.022                  +    XI     +
 8 -0.165                  + XXXXI     +
```

```
 9  0.036              +     IX    +
10 -0.021              +    XI     +
11  0.093              +     IXX   +
12 -0.016              +     I     +
13  0.140              +     IXXXX +
14 -0.077              +   XXI     +
15  0.059              +     IX    +
16  0.195              +     IXXXXX+
17 -0.127              +  XXXI     +
18 -0.180              +XXXXXI     +
19 -0.017             +      I      +
20  0.030             +      IX     +
21 -0.158             +  XXXXI      +
22  0.165             +      IXXXX  +
23  0.084             +      IXX    +
24 -0.148             +  XXXXI      +
25  0.080             +      IXX    +
PAGE  42     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  43     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ARIMA        VARIABLE IS GROUP2.
               DFORDER IS 1.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE
PAGE  44     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I1.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
```

```
INPUT  VARIABLE = NOISE    I1
PAGE  45     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I2.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2
PAGE  46     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS CLOSE.
               DFORDER IS 1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP2
INPUT  VARIABLE = NOISE    I1       I2       CLOSE
PAGE  47     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ESTIMATION  RESIDUAL IS IGROUP2./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE    I1       I2       CLOSE

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES
                                             1
GROUP2     RANDOM             1-  84  (1-B  )
                                             1
I1         BINARY             1-  84  (1-B  )
                                             1
```

I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP2	TRND	1	0	0.6373	1.1773	0.54
2	I1	UP	1	0	-0.6373	10.5961	-0.06
3	I2	UP	1	0	-8.6373	10.5961	-0.82
4	CLOSE	UP	1	0	-37:6373	10.5965	-3.55

RESIDUAL SUM OF SQUARES = 8760.398438
DEGREES OF FREEDOM = 79
RESIDUAL MEAN SQUARE = 110.891113

PAGE 48 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP2
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP2	RANDOM		1- 84	$(1-B^{1})$
I1	BINARY		1- 84	$(1-B^{1})$
I2	BINARY		1- 84	$(1-B^{1})$
CLOSE	BINARY		1- 84	$(1-B^{1})$

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE
1	GROUP2	TRND	1	0	0.6338
2	I1	UP	1	0	-0.6338
3	I2	UP	1	0	-8.6338
4	CLOSE	UP	1	0	-37.6338

```
                                  ST  ERR   T-RATIO
                                   1.1774      0.54
                                  10.5962     -0.06
                                  10.5962     -0.81
                                  10.5965     -3.55

RESIDUAL SUM OF SQUARES  =       8760.410156
                                 (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                79
RESIDUAL MEAN SQUARE     =        110.891266
PAGE  49    TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ACF          VARIABLE IS IGROUP2.
               MAXLAG IS 25./


NUMBER OF OBSERVATIONS            =          83
MEAN OF THE (DIFFERENCED) SERIES =      0.0036
STANDARD ERROR OF THE MEAN        =      1.1345
T-VALUE OF MEAN (AGAINST ZERO)    =      0.0031


AUTOCORRELATIONS

  1-  8     -.24 -.06  .08 -.13 -.05 -.01 -.10 -.13
  ST.E       .11  .12  .12  .12  .12  .12  .12  .12

  9- 12      .02  0.0  .04  .05
  ST.E       .12  .12  .12  .12

 13- 20      .11  .03  .02  .09 -.06 -.20  .03 -.03
  ST.E       .12  .12  .12  .12  .12  .12  .13  .13

 21- 25     -.10  .08  .10 -.07  .10
  ST.E       .13  .13  .13  .13  .13

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1 -0.243              X+XXXXI    +
 2 -0.062              +   XXI     +
 3  0.084              +     IXX   +
 4 -0.129              +  XXXI     +
 5 -0.055              +    XI     +
 6 -0.013              +     I     +
 7 -0.097              +   XXI     +
```

```
 8 -0.128             +  XXXI     +
 9  0.021             +     IX    +
10 -0.004             +     I     +
11  0.045             +     IX    +
12  0.046             +     IX    +
13  0.112             +     IXXX  +
14  0.033             +     IX    +
15  0.018             +     I     +
16  0.094             +     IXX   +
17 -0.057             +    XI     +
18 -0.201             +XXXXXI     +
19  0.030             +     IX    +
20 -0.030             +    XI     +
21 -0.103             +  XXXI     +
22  0.084             +     IXX   +
23  0.104             +     IXXX  +
24 -0.075             +   XXI     +
25  0.096             +     IXX   +
PAGE  50     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  51     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ACF          VARIABLE IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS            =            63
MEAN OF THE (DIFFERENCED) SERIES =       24.0635
STANDARD ERROR OF THE MEAN        =        0.9951
T-VALUE OF MEAN (AGAINST ZERO)    =       24.1822


AUTOCORRELATIONS

  1- 8       .25  .05  .10 -.11 -.23 -.11 -.02 -.10
  ST.E       .13  .13  .13  .13  .14  .14  .14  .14

  9- 12     -.02 -.04 -.20 -.08
  ST.E       .14  .14  .14  .15

 13- 20     -.11  0.0  .05  .01  .09  .13  .20 -.04
  ST.E       .15  .15  .15  .15  .15  .15  .15  .16
```

```
 21- 25     -.11 -.06 -.18 -.11  0.0
  ST.E       .16  .16  .16  .16  .16

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1  0.246               +     IXXXXXX
 2  0.053              +      IX     +
 3  0.098              +      IXX    +
 4 -0.108              +   XXXI      +
 5 -0.230              +XXXXXXI      +
 6 -0.106              +   XXXI      +
 7 -0.023              +     XI      +
 8 -0.102              +   XXXI      +
 9 -0.025              +     XI      +
10 -0.044              +     XI      +
11 -0.201              + XXXXXI      +
12 -0.079              +    XXI      +
13 -0.108              +   XXXI      +
14  0.005              +      I      +
15  0.048              +      IX     +
16  0.006              +      I      +
17  0.089              +      IXX    +
18  0.129              +      IXXX   +
19  0.198             +       IXXXXX  +
20 -0.045             +      XI       +
21 -0.109             +    XXXI       +
22 -0.063             +     XXI       +
23 -0.181             +  XXXXXI       +
24 -0.108             +    XXXI       +
25 -0.004             +       I       +
PAGE  52     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  PACF         VARIABLE  IS GROUP3.
               MAXLAG IS 25.
               TIME=1,63./


NUMBER OF OBSERVATIONS              =             63
MEAN OF THE (DIFFERENCED) SERIES =         24.0635
STANDARD ERROR OF THE MEAN          =          0.9951
T-VALUE OF MEAN (AGAINST ZERO)      =         24.1822


PARTIAL AUTOCORRELATIONS
```

```
  1- 12     .25 -.01  .09 -.16 -.18 -.02  .04 -.08
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

  1- 12    -.02 -.10 -.20  0.0
  ST.E      .13  .13  .13  .13

 13- 24    -.13  .07 -.03 -.10  .03  .06  .17 -.17
  ST.E      .13  .13  .13  .13  .13  .13  .13  .13

 13- 24    -.17 -.07 -.09  0.0  .01
  ST.E      .13  .13  .13  .13  .13
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.246              +     IXXXXXX
 2 -0.008              +     I     +
 3  0.092              +     IXX   +
 4 -0.165              + XXXXI     +
 5 -0.181              +XXXXXI     +
 6 -0.017              +     I     +
 7  0.042              +     IX    +
 8 -0.082              +   XXI     +
 9 -0.019              +     I     +
10 -0.103              +  XXXI     +
11 -0.197              +XXXXXI     +
12 -0.004              +     I     +
13 -0.126              +  XXXI     +
14  0.075              +     IXX   +
15 -0.031              +    XI     +
16 -0.104              +  XXXI     +
17  0.034              +     IX    +
18  0.061              +     IXX   +
19  0.171              +     IXXXX +
20 -0.168              + XXXXI     +
21 -0.172              + XXXXI     +
22 -0.073              +   XXI     +
23 -0.093              +   XXI     +
24 -0.002              +     I     +
25  0.009              +     I     +
```

PAGE 53 TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS BY GROUPS

```
  ARIMA       VARIABLE IS GROUP3.
              CONSTANT./
```

THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT VARIABLE = NOISE
PAGE 54 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION RESIDUAL IS RGROUP3.
TIME=1,63./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	24.0635	0.9951	24.18

RESIDUAL SUM OF SQUARES = 3867.738037
DEGREES OF FREEDOM = 62
RESIDUAL MEAN SQUARE = 62.382858
PAGE 55 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE

VARIABLE VAR TYPE MEAN TIME DIFFERENCES

```
GROUP3     RANDOM              1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3      MEAN     1       0    24.0635

                                    ST  ERR   T-RATIO
                                     0.9951     24.18

RESIDUAL SUM OF SQUARES  =      3867.739014
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =                62
RESIDUAL MEAN SQUARE     =        62.382874
PAGE  56     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ACF          VARIABLE IS RGROUP3
               MAXLAG IS 25
               TIME=1,63 /


NUMBER OF OBSERVATIONS            =           63
MEAN OF THE (DIFFERENCED) SERIES =        0.0000
STANDARD ERROR OF THE MEAN        =        0.9951
T-VALUE OF MEAN (AGAINST ZERO)    =        0.0000


AUTOCORRELATIONS

  1-  8      .25  .05  .10 -.11 -.23 -.11 -.02 -.10
  ST.E       .13  .13  .13  .13  .14  .14  .14  .14

  9- 12     -.02 -.04 -.20 -.08
  ST.E       .14  .14  .14  .15

 13- 20     -.11  0.0  .05  .01  .09  .13  .20 -.04
  ST.E       .15  .15  .15  .15  .15  .15  .15  .16

 21- 25     -.11 -.06 -.18 -.11  0.0
  ST.E       .16  .16  .16  .16  .16

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                                 I
 1  0.246                  +     IXXXXXX
 2  0.053                 +      IX      +
 3  0.098                 +      IXX     +
```

```
 4 -0.108             +   XXXI      +
 5 -0.230             +XXXXXXI      +
 6 -0.106             +   XXXI      +
 7 -0.023             +     XI      +
 8 -0.102             +   XXXI      +
 9 -0.025             +     XI      +
10 -0.044             +     XI      +
11 -0.201             + XXXXXI      +
12 -0.079             +    XXI      +
13 -0.108             +   XXXI      +
14  0.005             +      I      +
15  0.048             +      IX     +
16  0.006             +      I      +
17  0.089             +      IXX    +
18  0.129             +      IXXX   +
19  0.198            +       IXXXXX  +
20 -0.045            +      XI       +
21 -0.109            +    XXXI       +
22 -0.063            +     XXI       +
23 -0.181            +  XXXXXI       +
24 -0.108            +    XXXI       +
25 -0.004            +       I       +
PAGE  57     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ERASE        MODEL./


UNIVARIATE TIME SERIES MODEL ERASED
PAGE  58     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ARIMA        VARIABLE IS GROUP3.
               CONSTANT./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  59     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL
```

```
THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  60     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HÀS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1        I2
PAGE  61     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS

  ESTIMATION  RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1        I2

VARIABLE  VAR  TYPE  MEAN      TIME     DIFFERENCES

GROUP3      RANDOM              1-  84

I1          BINARY              1-  84

I2          BINARY              1-  84


PARAMETER VARIABLE    TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3       MEAN     1       0    24.0635
      2  I1            UP      1       0    -7.4802
      3  I2            UP      1       0    -0.8056

                                   ST  ERR   T-RATIO
                                    0.9387     25.64
                                    2.3466     -3.19
                                    3.2871     -0.25
```

```
RESIDUAL SUM OF SQUARES  =      4496.187500
DEGREES OF FREEDOM       =               81
RESIDUAL MEAN SQUARE     =        55.508484
PAGE  62     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE    I1       I2

VARIABLE  VAR  TYPE  MEAN      TIME      DIFFERENCES

GROUP3     RANDOM            1-  84

I1         BINARY            1-  84

I2         BINARY            1-  84


PARAMETER VARIABLE   TYPE  FACTOR  ORDER ESTIMATE
      1  GROUP3      MEAN    1       0     24.0635
      2  I1           UP     1       0     -7.4802
      3  I2           UP     1       0     -0.8056

                                ST  ERR   T-RATIO
                                 0.9387     25.64
                                 2.3468     -3.19
                                 3.2849     -0.25

RESIDUAL SUM OF SQUARES  =      4496.187500
                               (BACKCASTS EXCLUDED)
DEGREES OF FREEDOM       =               81
RESIDUAL MEAN SQUARE     =        55.508484
PAGE  63     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ACF         VARIABLE IS IGROUP3.
              MAXLAG IS 25./


NUMBER OF OBSERVATIONS              =           84
MEAN OF THE (DIFFERENCED) SERIES =          0.0000
STANDARD ERROR OF THE MEAN          =       0.8031
T-VALUE OF MEAN (AGAINST ZERO)      =       0.0000
```

AUTOCORRELATIONS

```
  1- 8     .23  .07  .02 -.12 -.25 -.09 -.03 -.04
  ST.E     .11  .11  .12  .12  .12  .12  .12  .12

  9- 12    0.0 -.05 -.23 -.05
  ST.E     .12  .12  .12  .13

 13- 20   -.09  .10  .07  .09  .07  .08  .01 -.09
  ST.E     .13  .13  .13  .13  .13  .13  .13  .13

 21- 25   -.13  0.0 -.14 -.07  .03
  ST.E     .13  .14  .14  .14  .14
```

PLOT OF SERIAL CORRELATION

```
LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                             I
 1  0.234               +    IXXXX+X
 2  0.066              +     IXX    +
 3  0.025              +     IX     +
 4 -0.121              +  XXXI      +
 5 -0.255              XXXXXXI      +
 6 -0.093              +   XXI      +
 7 -0.027              +    XI      +
 8 -0.042              +    XI      +
 9 -0.004              +     I      +
10 -0.055              +    XI      +
11 -0.229              XXXXXXI      +
12 -0.053              +    XI      +
13 -0.086              +   XXI      +
14  0.097              +     IXX    +
15  0.073              +     IXX    +
16  0.086              +     IXX    +
17  0.069              +     IXX    +
18  0.083           +      IXX     +
19  0.011           +      I       +
20 -0.093           +    XXI       +
21 -0.135           +   XXXI       +
22 -0.005           +      I       +
23 -0.140           +   XXXI       +
24 -0.067           +    XXI       +
25  0.026           +      IX      +
PAGE  64     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ERASE       MODEL./
```

```
UNIVARIATE TIME SERIES MODEL ERASED
PAGE  65     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  ARIMA        VARIABLE IS GROUP3
               CONSTANT /


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE
PAGE  66     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I1.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1
PAGE  67     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS I2.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
OUTPUT VARIABLE = GROUP3
INPUT  VARIABLE = NOISE    I1       I2
PAGE  68     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  INDEP        VARIABLE IS CLOSE.
               UPORDER IS '(0)'.
               TYPE IS BINARY./


THE COMPONENT HAS BEEN ADDED TO THE MODEL

THE CURRENT MODEL HAS
```

OUTPUT VARIABLE = GROUP3
INPUT VARIABLE = NOISE I1 I2 CLOSE
PAGE 69 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION RESIDUAL IS IGROUP3./

ESTIMATION BY CONDITIONAL LEAST SQUARES METHOD

RELATIVE CHANGE IN RESIDUAL SUM OF SQUARES
LESS THAN 0.1000E-04

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	24.8000	0.8913	27.83
2	I1	UP	1	0	7.2500	4.4567	1.63
3	I2	UP	1	0	-0.8056	3.0500	-0.26
4	CLOSE	UP	1	0	-15.4666	4.0841	-3.79

RESIDUAL SUM OF SQUARES = 3812.727539
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 47.659088
PAGE 70 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ESTIMATION BY BACKCASTING METHOD

RELATIVE CHANGE IN EACH ESTIMATE
LESS THAN 0.1000E-03

SUMMARY OF THE MODEL

OUTPUT VARIABLE -- GROUP3
INPUT VARIABLES -- NOISE I1 I2 CLOSE

VARIABLE	VAR TYPE	MEAN	TIME	DIFFERENCES
GROUP3	RANDOM		1- 84	
I1	BINARY		1- 84	
I2	BINARY		1- 84	
CLOSE	BINARY		1- 84	

PARAMETER	VARIABLE	TYPE	FACTOR	ORDER	ESTIMATE	ST ERR	T-RATIO
1	GROUP3	MEAN	1	0	24.8000	0.8913	27.82
2	I1	UP	1	0	7.2500	4.4569	1.63
3	I2	UP	1	0	-0.8056	3.0438	-0.26
4	CLOSE	UP	1	0	-15.4667	4.0843	-3.79

RESIDUAL SUM OF SQUARES = 3812.727295
(BACKCASTS EXCLUDED)
DEGREES OF FREEDOM = 80
RESIDUAL MEAN SQUARE = 47.659088
PAGE 71 TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS BY GROUPS

ACF VARIABLE IS IGROUP3.
MAXLAG IS 25./

NUMBER OF OBSERVATIONS = 84
MEAN OF THE (DIFFERENCED) SERIES = 0.0000
STANDARD ERROR OF THE MEAN = 0.7395
T-VALUE OF MEAN (AGAINST ZERO) = 0.0000

AUTOCORRELATIONS

1- 8	.12	.05	.03	-.07	-.26	-.02	-.05	-.06
ST.E	.11	.11	.11	.11	.11	.12	.12	.12

```
  9- 12     -.07 -.01 -.29 -.07
  ST.E       .12  .12  .12  .13

 13- 20     -.19  .06  .01  .08  .10  .18  .16  .02
  ST.E       .13  .13  .13  .13  .13  .13  .14  .14

 21- 25     -.04  .07 -.07  .04  .05
  ST.E       .14  .14  .14  .14  .14

PLOT OF SERIAL CORRELATION

LAG CORR
  -1.0 -0.8 -0.6 -0.4 -0.2  0.0  0.2  0.4  0.6  0.8  1.0
    +----+----+----+----+----+----+----+----+----+----+
                              I
 1  0.119                +    IXXX +
 2  0.053                +    IX   +
 3  0.030                +    IX   +
 4 -0.072                +  XXI    +
 5 -0.255               X+XXXXI    +
 6 -0.023               +    XI     +
 7 -0.045               +    XI     +
 8 -0.064               +   XXI     +
 9 -0.073               +   XXI     +
10 -0.014               +     I     +
11 -0.289              X+XXXXXI     +
12 -0.067               +   XXI     +
13 -0.190               +XXXXXI     +
14  0.060               +     IXX   +
15  0.006               +     I     +
16  0.076               +     IXX   +
17  0.104               +     IXXX  +
18  0.179              +      IXXXX  +
19  0.158              +      IXXXX  +
20  0.021              +      IX     +
21 -0.045              +     XI      +
22  0.071              +      IXX    +
23 -0.075              +    XXI      +
24  0.038              +      IX     +
25  0.050              +      IX     +
PAGE  72     TIME SERIES ANALYSIS OF TOTAL AD
ADMISSIONS  BY GROUPS

  END/

NUMBER OF INTEGER WORDS OF STORAGE USED IN
PRECEDING    PROBLEM    2454
CPU TIME USED       7.103 SECONDS
PAGE  73     TIME SERIES ANALYSIS OF TOTAL
AD ADMISSIONS  BY GROUPS
```

BMDP2T - BOX-JENKINS TIME SERIES PROGRAM
OCTOBER 2, 1982 AT 13:27:47

PROGRAM CONTROL INFORMATION

NO MORE CONTROL LANGUAGE

PROGRAM TERMINATED

APPENDIX B

CORRECTION FOR TPLOT ROUTINE IN BMDP2T - 1981 VERSION

The Statistical Analysis System (SAS) program listed below was used to correct the TPLOT routine in the BMDP2T (BMDP, 1981) program. It was invoked in the programs in Appendix A in Step 2 and was named 184sal.sas.cntl(figures). The correction is only needed when two or more groups are plotted in a common frame, in other words, only when the COMMON sentence in the TPLOT paragraph is used. When data points overlapped each other, the TPLOT routine would leave a blank rather than print an asterisk or other character. This correction was written by Pete Conlin of the Loyola University Academic Computing Center. It inserts an asterisk (*) wherever there is an unprintable hexadecimal code.

```
DATA _NULL_;
 INFILE IN;
FILE OUT NOTITLES NOPRINT;
 INPUT
  (COL1-COL133) ($1.);
IF COL8 ='00'X THEN COL8 ='*';
IF COL9 ='00'X THEN COL9 ='*';
IF COL10='00'X THEN COL10='*';
IF COL11='00'X THEN COL11='*';
IF COL12='00'X THEN COL12='*';
IF COL13='00'X THEN COL13='*';
```

```
IF COL14='00'X THEN COL14='*';
IF COL15='00'X THEN COL15='*';
IF COL16='00'X THEN COL16='*';
IF COL17='00'X THEN COL17='*';
IF COL18='00'X THEN COL18='*';
IF COL19='00'X THEN COL19='*';
IF COL20='00'X THEN COL20='*';
IF COL21='00'X THEN COL21='*';
IF COL22='00'X THEN COL22='*';
IF COL23='00'X THEN COL23='*';
IF COL24='00'X THEN COL24='*';
IF COL25='00'X THEN COL25='*';
IF COL26='00'X THEN COL26='*';
IF COL27='00'X THEN COL27='*';
IF COL28='00'X THEN COL28='*';
IF COL29='00'X THEN COL29='*';
IF COL30='00'X THEN COL30='*';
IF COL31='00'X THEN COL31='*';
IF COL32='00'X THEN COL32='*';
IF COL33='00'X THEN COL33='*';
IF COL34='00'X THEN COL34='*';
IF COL35='00'X THEN COL35='*';
IF COL36='00'X THEN COL36='*';
IF COL37='00'X THEN COL37='*';
IF COL38='00'X THEN COL38='*';
```

```
IF COL39='00'X THEN COL39='*';
IF COL40='00'X THEN COL40='*';
IF COL41='00'X THEN COL41='*';
IF COL42='00'X THEN COL42='*';
IF COL43='00'X THEN COL43='*';
IF COL44='00'X THEN COL44='*';
IF COL45='00'X THEN COL45='*';
IF COL46='00'X THEN COL46='*';
IF COL47='00'X THEN COL47='*';
IF COL48='00'X THEN COL48='*';
IF COL49='00'X THEN COL49='*';
IF COL50='00'X THEN COL50='*';
IF COL51='00'X THEN COL51='*';
IF COL52='00'X THEN COL52='*';
IF COL53='00'X THEN COL53='*';
IF COL54='00'X THEN COL54='*';
IF COL55='00'X THEN COL55='*';
IF COL56='00'X THEN COL56='*';
IF COL57='00'X THEN COL57='*';
IF COL58='00'X THEN COL58='*';
IF COL59='00'X THEN COL59='*';
IF COL60='00'X THEN COL60='*';
IF COL61='00'X THEN COL61='*';
IF COL62='00'X THEN COL62='*';
IF COL63='00'X THEN COL63='*';
```

```
IF COL64='00'X THEN COL64='*';
IF COL65='00'X THEN COL65='*';
IF COL66='00'X THEN COL66='*';
IF COL67='00'X THEN COL67='*';
IF COL68='00'X THEN COL68='*';
IF COL69='00'X THEN COL69='*';
IF COL70='00'X THEN COL70='*';
IF COL71='00'X THEN COL71='*';
IF COL72='00'X THEN COL72='*';
IF COL73='00'X THEN COL73='*';

PUT _INFILE_
 8      COL8            31    COL31
 9      COL9            32    COL32
 10     COL10           33    COL33
 11     COL11           34    COL34
 12     COL12           35    COL35
 13     COL13           36    COL36
 14     COL14           37    COL37
 15     COL15           38    COL38
 16     COL16           39    COL39
 17     COL17           40    COL40
 18     COL18           41    COL41
 19     COL19           42    COL42
 20     COL20           43    COL43
 21     COL21           44    COL44
```

22	COL22	45	COL45
23	COL23	46	COL46
24	COL24	47	COL47
25	COL25	48	COL48
26	COL26	49	COL49
27	COL27	50	COL50
28	COL28	51	COL51
29	COL29	52	COL52
30	COL30	53	COL53
54	COL54	63	COL63
55	COL55	64	COL64
56	COL56	65	COL65
57	COL57	66	COL66
58	COL58	67	COL67
59	COL59	68	COL68
60	COL60	69	COL69
61	COL61	70	COL70
62	COL62	71	COL71
		72	COL72

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APPROVAL SHEET

The dissertation submitted by Susan Ann Borkowski Lueger has been read and approved by the following committee:

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 10, 1982 — Emil J. Posavac

Date — Director's Signature