OCS Study
MMS 87-0042

Analysis of Indicators for Socioeconomic Impacts Due to OCS Oil and Gas Activities in the Gulf of Mexico Year II

Appendix to Volume II

MMS U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Regional Office

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APPENDIX A

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Technical Documentation
For the Socioeconomic Impact Assessment Model (SAM)

There are two classes of subroutines along with the main program listed in this Appendix. The first class is the program option subroutines. The function of these subroutines is discussed as options in the manual. Only the essential technical information is mentioned here. The second class of subroutines is the support subroutines. These subroutines can be called by a variety of program option subroutines or other support subroutines. The syntax and function of these programs are discussed in detail. The main program calls a series of subprograms. The main program is relatively short.

There are two direct access files required by SAM. The first file is SAM.MSG which contains all the messages that are displayed on the screen. The second file is SAM.HLP which displays all the help menus when help is requested. Both of these file formats are discussed in the MSG and HELP subroutines.

SAM.FTN

Purpose : This is the main program to perform socioeconomic impact assessments. A series of sub-programs are called to execute each command in SAM.

Syntax : SAM

Subprograms called: CHANGE, COLLAP, DELETE, GETMAT, HELP, INFO, INSERT, LINV, MACRO, MACIF, MACEXT, MACINC, MACASN, MATH, MCGOTO, MOVE, MULPLY, NORMAL, PAGE, PRINT, PRINT, PUTMAT, PUTMAT, READFN, REGION, RESPND, SHIFT, SUM.

Commons :/ONE/,/TWO/,/SIX/,/A/,/PRTFMT/.

Comments: The maximum matrix size is set to 00550. The leading zeros permit easy global change to any size matrix.

ADJUST.FTN

Purpose : The ADJUST subroutine is a SAM option that checks a transactions table for negative values in the final demand column.

Syntax : CALL ADJUST

Files : none

Called by: ECONIO

Subroutines called: READD, READN2.

Commons : /ONE/,/TWO/.

ANSW.FTN

Purpose : The ANSW subroutine prompts the user for a response from a list of choices. A prompt message is given as dictated by the calling program. If an exact answer or an abbreviation which the user enters corresponds to the list of choices then the program returns the position number of the match.

Syntax : CALL ANSW(NUMANS,ANSWR,IWHICH,IN,I1,I2,HLPMSG)

Where :
- NUMANS - The number of answers to choose from.
- ANSWR - A character*32 array that holds the answers from which to choose.
- IWHICH - The position in ANSWR that corresponds to the users entry.
- IN - Message number. Used by MSG.FTN.
- I1 - First numeric value for prompt message.
- I2 - Second numeric value for prompt message.
- HLPMSG - Name of calling program. This is used when the HELP response is given.

Called by: APPEND, APPROX, BUILD, COLLAP, DELETE, GETMAT, INSERT, MATH, MOVE, MULPLY, NORMAL, PRINT, READD, REGION, RESPND, SUM.

Subroutines called : GETTOK, HELP.

Commons : /ONE/,/TWO/.

Comments: This program calls MSG.FTN which issues a prompt message for the calling program. ANSW reads a response from the terminal and compares it to a list of words in ANSWR. When an exact match is found the position of the exact match in ANSWR is returned in variable IWHICH. If an exact match is not found then the program searches for abbreviations. If an abbreviation is found the position in ANSWR is returned in variable IWHICH. If 'HELP' is entered as a response then the HELP.FTN program is called.

APPEND.FTN

Purpose : To augment on to the current matrix either a vector or a matrix either on the right side or on the bottom. The APPEND subroutine is a program option.

Syntax : CALL APPEND

Called by: SAM.

Subroutines called : ANSW, GETMAT, MSG, READD.

Commons : /ONE/,/TWO/.

APPPRT.FTN

Purpose : This support subroutine exclusively is called by the APPROX subroutine. Total sector impacts are printed with respect to the number of successive approximations in the APPROX routine.

Syntax : CALL APPPRT(A,NR,NC,NRU,ISC,IFC,ITOT,NAME,UNIT)

Where :
- A - is the matrix to be printed.
- NR - the maximum number of rows in matrix A.
- NC - the maximum number of columns in matrix A.
- NRU - the current number of rows in matrix A.
- ISC - starting column to print.
- IFC - final column to print.
- ITOT - column where the totals are stored.
- NAME - name of the matrix, e.g., test.dat.
- UNIT - unit=6 for terminal and unit=8 for printer.

Called by: APPROX.

Subroutines called : none.

Commons : none.

BALANCE.FTN

Purpose : This program option subroutine uses a biproportional matrix balancing technique to assure that the row sums are equal to the column sums. Convergence is set to .01.

Syntax : CALL BALANCE

Called by : SAM.

Subroutines called : READD, RESPND

Commons : /ONE/,/TWO/,/SIX/

BUILD.FTN

Purpose : This program option subroutine constructs a new current matrix. The type of table can be specified. The matrix is constructed one column at a time.

Syntax : CALL BUILD

Called by: SAM

Subroutines called : ANSW, MSG, READD, READFN, READN2.

Commons : /ONE/,/TWO/.

CHANGE.FTN

Purpose : This program option subroutine permits individual cell values in the current matrix to be changed.

Syntax : CALL CHANGE

Called by: SAM.

Subroutines called : INFO, MSG, READD.

Commons : /ONE/,/TWO/.

COLLAP.FTN

Purpose : This program option subroutine collapses either a contiguous set of rows or a contiguous set of columns. The number of rows and columns are reduced, respectively.

Syntax : CALL COLLAP

Called by : SAM.

Subroutines called : ANSW, MSG, READD.

Commons : /ONE/,/TWO/.

DELETE.FTN

Purpose : This program option subroutine deletes an entire row, an entire column, a single cell from a row, or a single cell from a column.

Syntax : CALL DELETE

Called by : SAM.

Subroutines called : ANSW, INFO, READN2.

Commons : /ONE/,/TWO/,/A/.

Comments : When a single cell is removed from a row, all elements to the right of the deleted cell are shifted left. The furthest right cell is filled with a zero. Similarly, when a single cell is removed from a column, all elements below the deleted cell are shifted up. The bottom cell is filled with a zero.

GETMAT.FTN

Purpose : This support subroutine retrieves a standard SAM data file, an ANSII text data file, or a .DIF data file (information data format). The data may be retrieved from any volume.

Syntax : GETMAT (A,NR,NC,ITYPE,ISAVE,IMSG,HLPMSG)

where : A - is the matrix to receive the data from disk.
NR - is the number of rows in the new matrix.
NC - is the number of columns in the new matrix.
ITYPE- is the type of matrix retrieved.
The acceptable values are:
1 - Transactions table,
2 - Direct requirements table,
3 - Total requirements table,
4 - Data table, and
5 - Data table.
IMSG - is the prompt message number used.
If IMSG is zero then no message is displayed.
HLPMSG- is the name of calling program. If 'HELP" is requested then help will be for the calling program.

Called by : APPEND, MATH, REGION, SAM.

Subroutines called : ANSW, MACEXT, PUTMAT, READFN, RESPND.

Commons : /ONE/,/TWO/,/A/.

Standard Sam file format

The data is stored in an unformatted index sequential form.
Record 1: The first record contains three integer*4 values;
NR - number of rows,
NC - number of columns, and
ITYPE - value of the type of matrix retrieved.
Record 2: The second record contains all the values of the matrix. The data is stored in column sequence.

ASCII file format

The ASCII data files, sometimes called flat files, can be edited or created using the SAM text editor. Data is read from the ASCII data files by row. These files are indexed sequentially with a record length of 80 characters.

DIF file format

The DIF file format is supplied for easy data transfer to a variety of programs on an IBM (or, 100% compatible) personal computer. The standard DIF format is followed except that only numeric values can be used. These files have a record length of 80 characters.

GETTOK.FTN

Purpose : This support subroutine retrieves the next token placed in the TOKARR buffer. If the buffer is empty GETTOK issues a prompt message to the user and accepts a response. The entered responses are not tested to match particular value or character string.

Syntax : CALL GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)

Where : TOKVAL - is the response entered by the user,
IN - is the message number for the prompt,
I1 - is the first numeric value in the prompt,
I2 - is the second numeric value in the prompt,
ERR - if = 1 then an error occurred on the previous command. The TOKARR buffer is then cleared. If ERR equals zero then no error occurred, and processing continues as normal.
IFLAG - If IFLAG=1 then the prompt message is not displayed on the terminal. If IFLAG=0 the prompt message is displayed on the terminal.

Called by: ANSW, MACRO, PRINT, READD, READFN, READN2.

Subroutines called : READST.

Commons : /A/.

Comments: This program substitutes the %n symbols entered with the contents of the %n variables. The %n variables are %0, %1, ..., %9. These variables can be set to values or character strings using the ASSIGN or PROMPT commands. TSLIST stores the contents of the %n variables with TSLIST(1) containing the value of %0.

Special Commands

There are a variety of commands that are executed in the GETTOK subroutine. These commands are specifically designed for use while executing a macro.

PROMPT - When the PROMPT command is issued the program does not check the TOKARR buffer for contents. Whatever the user enters, whether it is one or more words or numbers, these tokens are placed at the top of the stack. If the PROMPT is followed by an %n variable the user responses are placed in the %n variables instead of the stack.

MESSAGE - The line following the command MESSAGE is displayed on the terminal. Any %n variables included in the list are substituted with the corresponding contents. This option is often used in macros when the ECHO OFF command is issued. Customs options can be designed in using the MESSAGE command in macros.

ECHO - When ECHO ON is issued the program displays all the command questions and responses on the monitor while executing a macro. IF ECHO OFF is issued then the messages are not displayed on the monitor.

" - The " command is similar to the MESSAGE command except that the input line is not parsed and the output goes to the printer instead of the monitor. Since the input line is not parsed output can be formatted using spaces. Using the " option permits the use of the %M variables. See READST.

HELP.FTN

Purpose : This support subroutine displays help screens to assist the user with any particular command. The HELP command can be issued from nearly any subprogram that requires user response.

Syntax : CALL HELP(NEED)

Where : Need - is a character*16 variable that contains the name of any of the SAM options.

Called by: ANSW, READD, READFN, READN2, READST, SAM.

Subroutines called : none

Commons : none.

File format

One file is used by SAM which contains all the information to be displayed for help.

Format : Direct Access.
Length : Logical record length is 80.
Header : Records 1 through 10.
The header records contain the first four letters of each command and the record number in the SAM.HLP file for which a help screen is available. The names are stored in a CHARACTER*4 array called LCODE, and the location is stored in an INTEGER*2 array called IPOINT. Ten name and location pairs are stored on each line of the header.

INFO.FTN

Purpose : To display information on the current matrix, A.

Syntax : CALL INFO

Called by : CHANGE, DELETE, MULPLY, NORMAL, PRINT, SAM.

Subroutines called : none.

Commons : /ONE/,/TWO/,/SIX/

INSERT.FTN

Purpose : This program option subroutine inserts an element into a row or a column.

Syntax : CALL INSERT

Called by : SAM.

Subroutines called : ANSW, READD.

Commons : /ONE/,/TWO/.

LIFO.FTN

Purpose : This support subroutine places a set of tokens on the top of the TOKARR stack. LIFO is useful when one subprogram chains to another subprogram. After the first subprogram ends execution the main program checks the stack for another command. It then finds the option name placed there by the first subprogram.

Syntax : CALL LIFO (ALPHA,J1,N)

Where : ALPHA - a character*32 array that holds a list of tokens.
J1 - the location in ALPHA of the first token to place on the TOKARR stack.
N - the number of tokens to place on the stack.

Called by : MATH.

Subroutines called : none.

Commons : /A/

LINV.FTN

Purpose : This program option subroutine prepares the current matrix, A, to form (I-A). The standard inverse routine is then called. Upon completion or the inverse the table type is changed to 3, reflecting that it is a total requirements table.

Syntax : CALL LINV

Called by : SAM.

Subroutines called : MINV.

Commons : /ONE/,/TWO/.

MACRO.FTN

Purpose : This command program switches control from the keyboard of the monitor to a macro file. The macro, upon completion, will return control to the keyboard. Any command that can be entered on the keyboard may be entered in a macro. All macro files are ASCII text files. An automatic ECHO OFF is issued when a macro is stated.

Syntax : CALL MACRO

Called by : SAM.

Subroutines called : READFN.

Commons : /A/.

File format

The macro files are indexed sequentially with a record length of 80 characters.

MACEXT.FTN

Purpose : This support subroutine closes the macro file and returns control to the terminal keyboard. The command EXIT may also be used in a macro to end the macro and return control to the terminal.

Syntax : CALL MACEXT

Called by : GETMAT, MCGOTO, MACINC, SAM.

Subroutines called : none.

Commons : /A/.

Comments: The macro file is closed and unit 5, the monitor, is used to read information.

MACASN.FTN

Purpose : This command subroutine assigns any number or character string to a %n variable.

Syntax : CALL MACASN

Called by : SAM.

Subroutines called : GETTOK.

Commons : /ONE/,/TWO/,/A/.

Comments : The %n variables are stored as CHARACTER*32.

MACINC.FTN

~Purpose : This command subroutine increments the value of a %n variable. The command INCREMENT invokes this subroutine.

Syntax : CALL MACINC

Called by : SAM.

Subroutines called : READN2.

Commons : /ONE/,/TWO/,/SIX/

Comments: If an error occurs in an assignment statement the macro is aborted using the MACEXT subprogram.

MACIF.FTN

Purpose : This command subroutine permits the user to test or compare numbers from the current table, %n variables, or character strings. If the comparison is true then the program continues executing commands from the TOKARR buffer. If the comparison is false the TOKARR buffer is cleared.

Syntax : CALL MACIF

Called by : SAM.

Subroutines called : GETTOK, READN2.

Commons : /ONE/,/TWO/,/SIX/.

Comments: If an error occurs in comparing two numbers the subprogram will keep prompting for a valid number.

MCGOTO.FTN

Purpose : This command subroutine branches to a designated line in a macro.

Syntax : CALL MCGOTO

Called by : SAM.

Subroutines called : MACEXT.

Commons : none.

Comments: The subroutine performs a rewind on logical unit 5. The corresponding address is search in column 1 of each record until a match if found. If there is no match then the macro is aborted with a MACEXT call.

SHIFT .FTN

Purpose : This command subroutine shifts the %n variables so that %0 = %1, %1 = %2,... %8=%9, %9=blank.

Syntax : CALL SHIFT

Called by : SAM.

Subprograms called : none.

Commons : /A/.

MATH.FTN

Purpose : This command subroutine performs scalar, vector, and matrix algebra.

Syntax : CALL MATH

Called by : SAM.

Subprograms called : ANSW, GETMAT, INVERT, LIFO, READFN, READN2.

Commons : /ONE/,/TWO/,/SIX/.

INVERT.FTN

Purpose : This support subroutine calculates an in place inverse in double precision on the current matrix, A.

Syntax : CALL INVERT

Called by : LINV, MATH, MULPLY.

Subroutines called : none.

Comments: The A matrix and R matrix are contiguous data sets. The matrix Z is a double precision matrix which overlays the A and R matrices. The values in A are copied to Z in such a was so as not to destroy any of the values. The inverse is performed on the double precision numbers. The values are then moved from Z back to A.

MOVE.FTN

Purpose : This program option subroutine moves a single row or column to a new location.

Syntax : CALL MOVE

Called by : SAM.

Subroutines called : ANSW, READN2.

Commons : /ONE/,/TWO/.

MSG.FTN

Purpose : This support subroutine displays a message on the terminal monitor.

Syntax : CALL MSG (N1,N2,N3)

Where : N1 - message number,
N2 - first numeric value to be displayed, and
N3 - second numeric value to be displayed.

Called by : APPEND, BUILD, CHANGE, COLLAP, GETMAT, LINV, MULPLY, PRINT, READST, REGION, SUM, SAM.

Subroutines called : none.

Commons : none.

Comments: MSG retrieves message stored on a direct access file. The message number is converted into a starting record pointer and number of records pointer. The messages are stored as FORTRAN variable format statements. The number of numeric values to be printed in the format is given by the first character of the message record.

File Format

The SAM.HLP direct access file is 80 characters in length. All values in the headers are INTEGER*4 values. The header is the first 17 records of the SAM.HLP file.

Record 1	: The number of messages and the number of records permitted in the file.
Records 2-9	: A list of pointers for starting position for each of the possible messages. If a message number has no corresponding message then the message number is set to 0.
Records 10-17:	A list of the number of records per message number. This corresponds to the list of starting positions on a one to one basis.
Records 18-	: The messages. The first character is either a 0, 1, or 2, specifying the number of numeric values to be printed with each message. The remaining characters are stored in a FORTRAN variable format form.

MULPLY.FTN

Purpose : This program option subroutine calculates a variety of input-output multipliers.

Syntax : CALL MULPLY

Called by : SAM.

Subroutines called :ANSW, GETMAT, INFO, INVERT, MSG, READD, READN2, RESPND.

Commons : /ONE/,/TWO/,/SIX/.

NORMAL.FTN

Purpose : This program option subroutine normalizes either columns or rows of the current matrix, A. The totals at the bottom or far right column can be used for normalization if present or totals can be generated.

Syntax : CALL NORMAL

Called by : SAM.

Subroutines called : ANSW, INFO, READN2, RESPND.

Commons : /ONE/,/TWO/.

PAGE.FTN

Purpose : This program option subroutine advances the printer to the top of the form.

Syntax : CALL PAGE

Called by : SAM.

Subroutines called : none.

Commons : none.

PRINT.FTN

Purpose : This program option subroutine defines the number of rows and columns to print along with the page format.

Syntax : CALL PRINT(IUNIT)

Where : IUNIT - is the unit number to output the information.
If IUNIT=5 the output will go to the monitor,
if IUNIT=8 the output will go to the printer.

Called by : SAM.

Subroutines used : ANSW, GETTOK, INFO, MSG,
PRTMAT, READD, READST, RESPND.

Comments: If an output file is created for output then the allocation is set to the system default length. Generally, this length would be 80 characters.

PRTMAT.FTN

Purpose : This support subroutine prints a matrix in accordance to the parameters specified by PRINT.

Syntax : CALL PRTMAT(A,NR,NC,NRS,NRF,NCS,NCF,NRFM,IUNIT)

Where : A - is the matrix to be printed,
NR - the number of rows in the matrix,
NC - the number of columns in the matrix,
NRS- the starting row number to print,
NRF- the final row number to print,
NCS- the starting column number to print,
NCF- the final column number to print,
NRFM-the row number where the multipliers are, and
IUNIT - the logical unit which will receive the output.

Called by : APPROX, PRINT.

Subroutines called : none.

Commons : /PRTFMT/.

PUTMAT.FTN

Purpose : This support subroutine saves a standard SAM data file, an ANSII text data file, or a .DIF data file (information data format). The data may be retrieved from any volume.

Syntax : PUTMAT (A,NR,NC,ITYPE,ISAVE)

where : A - is the matrix to receive the data from disk.
NR - is the number of rows in the new matrix.
NC - is the number of columns in the new matrix.
ITYPE- is the type of matrix retrieved.
The acceptable values are:
1 - Transactions table,
2 - Direct requirements table,
3 - Total requirements table,
4 - Data table, and
5 - Data table.
ISAVE- if the file has been modified ISAVE=1,
otherwise ISAVE=0.

Called by : APPROX, GETMAT, SAM.

Subroutines called : READFN, RESPND.

Commons : /TWO/,/A/.

Standard Sam file format

The data is stored in an unformatted index sequential form.

Record 1: The first record contains three integer*4 values;
NR - number of rows,
NC - number of columns, and
ITYPE - value of the type of matrix retrieved.

Record 2: The second record contains all the values of the matrix. The data is stored in column sequence.

ASCII file format

The ASCII data files, sometimes called flat files, can be edited or created using the SAM text editor. Data is read from the ASCII data files by row. These files are indexed sequentially with a record length of 80 characters.

DIF file format

The DIF file format is supplied for easy data transfer to a variety of programs on an IBM personal computer. The standard DIF format is followed except that only numeric values can be used. These files have a record length of 80 characters.

READD.FTN

Purpose : This support subroutine reads in a vector of numbers after issuing a prompt. The numbers are bound by an upper and lower bound determined by the calling program.

Syntax : CALL READD(NUMVAL,NUMTOT,XLOWER,XVALUE,XUPPER,KKCODE, IN,I1,I2,HLPMSG)

Where :
- NUMVAL - reserved for later use,
- NUMTOT - total count of number to read,
- XLOWER - lower bound for all numbers,
- XVALUE - the vector of entered values,
- XUPPER - upper bound for all numbers,
- KKCODE - KKCODE=1, Everything is alright, KKCODE=4, Stop command was entered,
- IN - message number,
- I1 - first numeric value for the message,
- I2 - second numeric value for the message, and
- HLPMSG - the name of the calling program to use if the HELP command was requested.

Called by : ADJUST, APPROX, BALANC, BUILD, CHANGE, GETMAT, INSERT, MATH, MULPLY, REGION.

Subroutines called: ANSW, GETTOK, HELP, READN2.

Commons : /ONE/,/TWO/.

Comments: Normally, only numeric values may be entered without invoking an error message, but, there are certain non-numeric inputs that are valid. These are : STOP, GET, NR, and NC.

STOP returns with no value in XVALUE but the KKCODE flag receives the value 4, which the calling program must handle.

NR refers to the number of rows in the table. The NR is substituted for the actual value of the number of rows in the XVALUE vector.

NC refers to the number of columns in the table. The NC is substituted for the actual value of the number of columns in the XVALUE vector.

GET permits the user to extract any column or any row from a file saved under the standard SAM format. Instead of entering the vector of values from the terminal the values are retrieved from the file. The number of values in the row or column of the disk data file is not required to match the number of data points required.

READN2.FTN

Purpose : This support subroutine reads in a vector of numbers after issuing a prompt. The numbers are bound by an upper and lower bound determined by the calling program.

Syntax : CALL READN2(NUMVAL,NUMTOT,XLOWER,XVALUE,XUPPER,KKCODE, IN,I1,I2,HLPMSG)

Where :
- NUMVAL - reserved for later use,
- NUMTOT - total count of number to read,
- XLOWER - lower bound for all numbers,
- XVALUE - the vector of entered values,
- XUPPER - upper bound for all numbers,
- KKCODE - KKCODE=1, Everything is alright, KKCODE=4, Stop command was entered,
- IN - message number,
- I1 - first numeric value for the message,
- I2 - second numeric value for the message, and
- HLPMSG - the name of the calling program to use if the HELP command was requested.

Called by : ADJUST, BALANC, COLLAP, DELETE, MACRO, MOVE, NORMAL, PRINT, READD, READN2, REGION, SUM.

Subroutines called: GETTOK, HELP.

Commons : /ONE/,/TWO/.

Comments: Normally, only numeric values may be entered without invoking an error message, but, there are certain non-numeric inputs that are valid. These are : STOP, NR, and NC.

STOP returns with no value in XVALUE but the KKCODE flag receives the value 4, which the calling program must handle.

NR refers to the number of rows in the table. The NR is substituted for the actual value of the number of rows in the XVALUE vector.

NC refers to the number of columns in the table. The NC is substituted for the actual value of the number of columns in the XVALUE vector.

READFN.FTN

Purpose : This support subroutine prompts for a single token, generally, a file name.

Syntax : CALL READFN(FN,FT,IN,I1,I2,HLPMSG)

Where :
- FN - is the returning token (file name),
- FT - is reserved for later use,
- IN - is the message number,
- I1 - is the first numeric value in the message,
- I2 - is the second numeric value in the message,
- HLPMSG - the name of the calling program to use if the HELP command was requested.

Called by : BUILD, GETMAT, INSERT, MACRO, MATH, PUTMAT, REGION, SAM.

Subroutines called : GETTOK.

Commons : none.

READST.FTN

Purpose : This support subroutine reads a line from either the terminal or macro file without parsing the line into tokens. The %n and %M variables are substituted in the input line.

Syntax : CALL READST(LINE,IN,I1,I2,HLPMSG)

Where : LINE - is the line to return to the calling program. The line is scanned and all %n and %M variables are substituted. If the resultant line is longer than 80 characters the remainder is truncated.
IN - is the message number,
I1 - is the first numeric value in the message,
I2 - is the second numeric value in the message,
HLPMSG - the name of the calling program to use if the HELP command was requested.

Called by : GETTOK, PRINT.

Subroutines called : MSG, HELP

Commons : /ONE/,/TWO/,/A/.

Comments: The %M variables are used to place a formatted number from the current matrix in the token line. The syntax is %M,r,c,l,d:

where
%M - denotes that a matrix value will be substituted,
r - the row number of the matrix,
c - the column number of the matrix,
l - the number of characters that the number will occupy, (this includes the decimal point),
d - the number of digits after the decimal point.

REGION .FTN

Purpose : This program option subroutine permits the calculation of a new regional table under a variety of regionalization schemes.

Syntax : CALL REGION

Called by : SAM.

Subroutines called : ANSW, GETMAT, READD, READFN, READN2, RESPND.

Commons : /ONE/,/TWO/,/A/.

RESPND.FTN

Purpose : This support subroutine tests for a YES, NO, or STOP entry from the user. The value is read from the TOKARR stack.

Syntax : CALL RESPND(JWHICH,JMAX,IN,I1,I2,HLPMSG)

Where : JWHICH - the value returned to the calling program. JWHICH=1 if the response was "YES", JWHICH=2 if the response was "NO", and JWHICH=3 if the response was "STOP".
JMAX - is always 3. Future use is reserved.
IN - is the message number,
I1 - is the first numeric value in the message,
I2 - is the second numeric value in the message,
HLPMSG - the name of the calling program to use if the HELP command was requested.

Called by : BALANC, GETMAT, LINV, MULPLY, NORMAL, PUTMAT, REGION, SAM.

Subroutines called: ANSW.

Commons : none.

SUM.FTN

Purpose : This program option subroutine calculates either row or column sums and augments the result as a column or row respective.

Syntax : CALL SUM

Called by : SAM

Subroutines called : ANSW, MSG, READN2

Commons : /ONE/,/TWO/.

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C     ***********************************************************************
C     *            SOCIOECONOMIC ASSESSMENT MODEL   (SAM)                   *
C     *   THIS PROGRAM PERFORMS INPUT-OUTPUT ANALYSIS IN ACCORDANCE         *
C     *   TO THE STANDARD ECONOMIC LEONTIEF MODEL.                          *
C     ***********************************************************************
C
C
      PROGRAM SAM
C     ***********************************************************************
C     *       MAIN PROGRAM                                                  *
C     *                                                                     *
C     * THE MAIN PROGRAM CALLS A SERIES OF SUBRPROGRAMS. THERE IS ONE       *
C     * SUBPROGRAM FOR EACH OPTION.                                         *
C     ***********************************************************************
C
C      GENERAL GLOBAL VARIABLES
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C
      REAL Q(00550,00550)
      COMMON /SIX/ Q
C ***********************************************************************
C *               GLOBAL VARIABLES USED FOR THE "FORMATS"               *
C *                                                                     *
C *   IWIDE  : THE NUMBER OF DIGITS PER COLUMN          (DEFAULT 15)*
C *   ICOL   : THE NUMBER OF COLUMNS PER PAGE OF OUTPUT (DEFAULT 5) *
C *   IDEC   : THE NUMBER OF DECIMAL POINTS             (DEFAULT 5) *
C *   LPP    : THE NUMBER OF LINES PER PAGE OF OUTPUT   (DEFAULT 66)*
C *   HEADER : UPTO 3 HEADINGS CAN BE USED ON THE TOP OF EACH PAGE  *
C *   FOOTER : ONLY 1 FOOTER CAN BE USED ON THE BOTTOM OF EACH PAGE *
C *   FMT1   : THE FORTRAN FORMAT TO DISPLAY THE COLUMN NUMBERS     *
C *   FMT2   : THE FORTRAN FORMAT TO DISPLAY THE DATA               *
C ***********************************************************************
      CHARACTER*80 FMT1,FMT2,HEADER(3),FOOTER
      COMMON /PRTFMT/ IWIDE,ICOL,IDEC,LPP,HEADER,FOOTER,FMT1,FMT2
C
C     GLOBAL VARIABLES TO HANDLE THE INPUT STACK
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      CHARACTER*1  TOK1(32)
      CHARACTER*16 HLPMSG,GETX
      CHARACTER*32 ICODE(45),FNAME
      EQUIVALENCE (FNAME,TOK1)
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C
      DATA ICODE/'ADJUST    ','APPEND    ','APPROX    ','BALANCE   ',
     *           'BUILD     ','CHANGE    ',             'COLLAPSE  ',
     *           'DELETE    ','GET       ',
     *           'HELP      ','INFO      ','INSERT    ',
     *           'L-INVERSE ','MACRO     ','MATH      ','MOVE      ',
     *           'MULTIPLIER','NORMALIZE ','PAGE      ','PRINT     ',
     *           'REGIONAL  ','SAVE      ','STOP      ',
     *           'SUM       ','TYPE      ','SHIFT     ','GOTO      ',
     *           'IF        ','EXIT      ','INCREMENT ','ASSIGN    ',
     *           'YES       ','NO        ','SLQ       ','CIQ       ',
     *           'PLQ       ','SDP       ','RAS       ','FINAL     ',
     *           'EMPLOYMENT','INCOME    ','INDUSTRY  ','OUTPUT    ',
     *           'SUPPLY    ','SPECIAL   '/
      DATA ERASEX/'ERASE '/,GETX/'GET '/
C
      CALL OPENER
C     DISPLAY THE WELCOME SCREEN
      HLPMSG='WELCOME'
      CALL HELP(HLPMSG)
C     WRITE(6,'(24(/))')
C
C     INITIALIZE THE CONSTANTS
      NC = 0
      NR = 0
C     MAXIMUM MATRIX SIZE IS 00550
      MAXR = 00550
      RL = -1.0E9
      RU = 1.0E9
C     LOWER BOUNDS ARE STORED IN XL
      XL(1) = 0.
      XL(2) = 0.
C     UPPER BOUNDS ARE STORED IN XU
      XU(1) = MAXR
      XU(2) = MAXR
      YL(1) = 0.
      YL(2) = 0.
      YL(3) = -1.0E9
      YU(1) = MAXR
      YU(2) = MAXR
      YU(3) = 1.0E9
      ITYPE = 0
      ISAVE = 0
      IFLAG = 0
      NEXT=1
C     INPUT IS PARSED INTO THE TOKARR STACK
      TOKARR(1)='END'
      ERR=1
C     FORMATTING INITIALIZATION
      IWIDE=15
      ICOL=5
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

      IDEC=4
      LPP=66
      HEADER(1)='DEFAULT'
      HEADER(2)='DEFAULT'
      HEADER(3)='DEFAULT'
      FOOTER=' '
C     SET MESSAGE FLAGS
      MSGON=.TRUE.
      MACON=.FALSE.
      WORKON=.TRUE.
C
C     ** MAIN PROGRAM LOOP
100   PROMPT='SAM'
C     REQUEST FROM THE USER AN OPTION COMMAND
      CALL ANSW(36,ICODE,J1,1,0,0,'NOHELP          ')
      PROMPT=ICODE(J1)
      GOTO  (2010,2020,2030,2040,2050,2060,     2080,2090,
     *       2110,     2130,     2150,2160,2170,2180,2190,2200,
     *       2210,2220,2230,2240,2250,2260,2270,     2290,2300,
     *       2310,2320,2330,2340,2350,2360,2370,100,100,100),J1
      CALL MSG(2,0,0)
      GO TO 100
2010  CALL ADJUST
      GO TO 100
2020  CALL APPEND
      GO TO 100
2030  CALL APPROX
      GO TO 100
2040  CALL BALANC
      GO TO 100
2050  CALL BUILD
      GO TO 100
2060  CALL CHANGE
      GO TO 100
2080  CALL COLLAP
      GO TO 100
2090  CALL DELETE
      GO TO 100
2130  CALL GETMAT(A,NR,NC,ITYPE,ISAVE,0,GETX)
      IF (MSGON) CALL INFO
      GO TO 100
2140  HLPMSG='HELP'
      CALL ANSW(47,ICODE,J1,2,0,0,HLPMSG)
      IF (J1.GE.1 .AND. J1.LE.47) HLPMSG=ICODE(J1)
      IF (J1.GE.28.AND. J1.LE.33) HLPMSG='MACRO '
      CALL HELP(HLPMSG)
      GO TO 100
2160  CALL INFO
      GO TO 100
2170  CALL INSERT
      GO TO 100
2180  CALL LINV
```

```
      GOTO 100
2190  CALL MACRO
      GOTO 100
2200  CALL MATH
      GO TO 100
2210  CALL MOVE
      GO TO 100
2220  CALL MULPLY
      GO TO 100
C     NORMALIZE THE MATRIX
2230  CALL NORMAL
      GO TO 100
2240  CALL PAGE
      GOTO 100
C     PRINT A MATRIX ON THE PRINTER
2250  CALL PRINT(8)
      GO TO 100
2260  CALL REGION
      GO TO 100
2270  CALL PUTMAT(A,NR,NC,ITYPE,ISAVE)
      GO TO 100
2300  CALL SUM
      GO TO 100
C     DISPLAY A MATRIX ON THE TERMINAL
2310  CALL PRINT(6)
      GOTO 100
2320  CALL SHIFT
      GOTO 100
2330  CALL MCGOTO
      GOTO 100
2340  CALL MACIF
      GOTO 100
2350  CALL MACEXT
      GOTO 100
2360  CALL MACINC
      GOTO 100
2370  CALL MACASN
      GOTO 100
C
2290  IF (ISAVE.EQ.0) STOP
      CALL RESPND(JA,3,4,0,0,'STOP            ')
      GO TO (3010,3020,100,2240),JA
3010  CALL PUTMAT(A,NR,NC,ITYPE,ISAVE)
3020  STOP
      END
*     ***********************************************************************
C     *       SUBROUTINE ADJUST                                             *
C     ***********************************************************************
      SUBROUTINE ADJUST
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*16 ADJX
      DATA ADJX/'ADJUST '/
      NEXPT=NC-1
      NCT2=NC-2
5     ADJTOT=0.
      DO 20 I=1,NR
      IF (A(I,NEXPT).GE.0.0) GOTO 20
      ADJTOT=1.
      WRITE (6,10) I,A(I,NEXPT)
10    FORMAT(' ROW ',I3,' NEEDS ADJUSTMENT. EXPORT VALUE IS ',F12.4)
20    CONTINUE
      IF (ADJTOT.EQ.0.) WRITE (6,30)
30    FORMAT(' NO DATA ADJUSTMENT IS NEEDED. ENTER STOP AT THE NEXT ',
     *       'QUESTION.')
C
40    ADJTOT = 0.
      CALL READN2(1,1,1.,X,FLOAT(MAXR),KK,7,0,0,ADJX)
      GO TO(60,40,40,120,5,40,40),KK
60    NRA = X(1)
70    CALL READD(1,1,RL,B,RU,KK,8,0,0,ADJX)
      GO TO(90,70,70,40,5,70,70),KK
90    ISAVE=1
      A(NRA,NEXPT)=B(1)
      DO 100 J=1,NCT2
100   ADJTOT = ADJTOT + A(NRA,J)
      ADJTOT = (A(NRA,NC)-A(NRA,NEXPT))/ADJTOT
      DO 110 J=1,NCT2
110   A(NRA,J)=A(NRA,J)*ADJTOT
      GOTO 5
120   RETURN
      END
C$DEBUG
C     ****************************************************************
C     *   SUBROUTINE ANSW                                            *
C     ****************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE ANSW(NUMANS,ANSWR,IWHICH,IN,I1,I2,HLPMSG)
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      INTEGER NUMANS,IWHICH,IN,I1,I2,ERR,NEXT,IFLAG
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

      CHARACTER*32 TOKVAL
      CHARACTER*32  ANSWR(NUMANS),CODE,TOK
      CHARACTER*16 HLPMSG
      CHARACTER*1   CODE1(16),TOK1(16)
      EQUIVALENCE   (CODE,CODE1), (TOK,TOK1)
      IFLAG=0
      ERR=0
100   CALL GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)
      DO 110 IWHICH = 1,NUMANS
          IF  (TOKVAL.EQ.ANSWR(IWHICH)) GO TO 500
110   CONTINUE
C     SYNONYMN CHECK SECTION
      TOK=TOKVAL
      DO 200 LENGTH=2,16
        IF (TOK1(LENGTH).EQ.' ') GOTO 210
200   CONTINUE
      GOTO 400
210   IWHICH=0
      LENGTH=LENGTH-1
      DO 220 J=1,NUMANS
        CODE=ANSWR(J)
        DO 230 K=1,LENGTH
          IF (CODE1(K).NE.TOK1(K)) GOTO 220
230     CONTINUE
        IF(IWHICH.NE.0) THEN
          WRITE (6,250) TOKVAL,ANSWR(IWHICH),ANSWR(J)
250       FORMAT(1X,A10,' IS AN AMBIGUOUS SYNONYM, IT COULD BE ',A11,
     *         ' OR ',A11)
          ERR=1
          ENDIF
        IWHICH=J
220   CONTINUE
      IF (IWHICH.EQ.0) ERR=1
      IF (ERR.EQ.0) GOTO 500
      IWHICH=NUMANS+1
400   IF (TOKVAL.EQ.'HELP ') THEN
         CALL HELP(HLPMSG)
         GOTO 100
         ENDIF
      WRITE (6,410) TOKVAL,(ANSWR(I),I=1,NUMANS)
410   FORMAT (/,' INVALID INPUT.',A8,' THE FOLLOWING OPTIONS ARE ',
     *       'AVAILABLE:',//8(1X,5(A15)/))
      GO TO 100
500   RETURN
      END


C     ***************************************************************
C     *       SUBROUTINE APPEND (ROW,COLUMN,OR MATRIX)              *
C     ***************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE APPEND
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      CHARACTER*32 ICODE(4)
      DATA ICODE/'ROWS','COLUMNS','STOP','MATRIX'/
      CALL ANSW(4,ICODE,J1,78,0,0,'APPEND')
      GOTO (300,400,60,130),J1
C
C     ***********************************************************************
C     *       APPEND A MATRIX                                               *
C     ***********************************************************************
C     APPEND A MATRIX, DETERMINE BY ROWS (UNDER) OR COLUMNS (RIGHT)
130   CALL ANSW(3,ICODE,J1,79,0,0,'APPEND')
      GOTO (140,140,60),J1
C     GET THE DATA FILE
140   I=0
      IR=0
      CALL GETMAT(R,IR,IC,IT,I,I,'APPEND')
      IF  (IR.EQ.0) GOTO 60
      IF ((J1.EQ.1.AND.IR+NR.GT.MAXR)  .OR.
     C    (J1.EQ.2.AND.IC+NC.GT.MAXR)) THEN
         CALL MSG(80,MAXR,0)
         GOTO 60
         ENDIF
      GOTO (150,220),J1
      ISAVE=1
C     APPEND BY ROWS (BOTTOM SIDE)
150   DO 160 I=NR+1,NR+IR
         DO 160 J=1,IC
160      A(I,J)=R(I-NR,J)
C     SET TO ZERO ALL OTHER PARTIAL COLUMNS
      IF (NC-IC) 170,210,190
C     CLEAN THE TOP PORTION OF THE EXTRA COLUMNS
170   DO 180 I=1,NR
         DO 180 J=NC+1,IC
180      A(I,J)=0.0
      NC=IC
      GOTO 210
C     CLEAN THE BOTTOM PORTION OF THE EXTRA COLUMNS
190   DO 200 I=NR+1,NR+IR
        DO 200 J=IC+1,NC
200     A(I,J)=0.0
210   NR=IR+NR
      GOTO 60
C
C     APPEND BY COLUMNS (RIGHT SIDE)
220   DO 230 I=1,IR
```

```
         DO 230 J=NC+1,NC+IC
230      A(I,J)=R(I,J-NC)
      IF (NR-IR) 260,280,240
C     CLEAN RIGHT BOTTOM PORTION OF THE  EXTRA ROWS
240   DO 250 I=IR+1,NR
         DO 250 J=NC+1,NC+IC
250      A(I,J)=0.0
      GOTO 280
C     CLEAN THE LEFT BOTTOM PORTION OF THE EXTRA ROWS
260   DO 270 I=NR+1,IR
         DO 270 J=1,NC
270      A(I,J)=0.0
      NR=IR
280   NC=NC+IC
      GOTO 60
C
C     ***********************************************************************
C     *                    ADDROW                                           *
C     ***********************************************************************
300   NRR = NR + 1
      CALL READD(NC,NC,RL,B,RU,KK,6,NC,NRR,'ADDROW          ')
      GOTO (320,300,300,60,300,300,300),KK
320   IF (NR.EQ.MAXR) THEN
         CALL MSG(80,MAXR,0)
         GOTO 60
         ENDIF
      NR = NR + 1
      DO 330 J = 1,NC
330   A(NR,J) = B(J)
      ISAVE=1
      GOTO 300
C
C     ***********************************************************************
C     *       SUBROUTINE ADDCOL                                             *
C     ***********************************************************************
400   NCC=NC+1
      CALL READD(NR,NR,RL,B,RU,KK,5,NR,NCC,'ADDCOL          ')
      GOTO (420,400,400,60,400,400,400),KK
420   IF (NC.EQ.MAXR) THEN
         CALL MSG(80,MAXR,0)
         GOTO 60
         ENDIF
      NC=NC+1
      DO 430 I=1,NR
430   A(I,NC)=B(I)
      ISAVE=1
      GOTO 400
C
60    RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE APPPRT                                             *
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE APPPRT(A,NR,NC,NRU,ISC,IFC,ITOT,NAME,UNIT)
      INTEGER ICT(00550),UNIT
      CHARACTER*4 IFMT(9),NCT(5)
      CHARACTER*36 IFMT2
      LOGICAL FLAG
      CHARACTER*32 NAME
      REAL A(00550,00550)
      EQUIVALENCE (IFMT2,IFMT)
      DATA NCT/'1   ','2   ','3   ','4   ','5   '/
      DATA IFMT/'(/,6','X,  ','****','(6X,','I3,6','X),5','X,''T',
     *          'OTAL',''',/)'/
      NCS=ISC+1
      NCF=IFC+1
      FLAG=.FALSE.
720   NCFF=NCS+5-1
      IF(NCFF.LE.NCF) GOTO 725
      NCFF=NCF
      FLAG=.TRUE.
725   NCU=NCFF-NCS+1
      DO730 J=NCS,NCFF
730   ICT(J)=J-1
      WRITE(UNIT,734) NAME
734   FORMAT(' ',5X,A12,5X,'SUCCESSIVE APPROXIMATIONS')
      IF (FLAG) GOTO 750
      WRITE(UNIT,740) (ICT(J),J=NCS,NCFF)
740   FORMAT(/,6X,5(6X,I3,6X),/)
      GOTO 760
750   IFMT(3)=NCT(NCU)
      WRITE(UNIT,IFMT2) (ICT(J),J=NCS,NCFF)
760   DO 780 I=1,NRU
      IF (.NOT.FLAG) WRITE(UNIT,770) I,(A(I,J),J=NCS,NCFF)
      IF (FLAG) WRITE(UNIT,770) I,(A(I,J),J=NCS,NCFF),A(I,ITOT)
770   FORMAT(I4,1X,5F15.4)
780   CONTINUE
      NCS=NCS+5
      IF (NCS.LE.NCF) GOTO 720
      IF (FLAG) GOTO 60
      WRITE(UNIT,734) NAME
      WRITE(UNIT,790)
790   FORMAT(/,11X,'TOTAL',/)
      DO 800 I=1,NRU
800   WRITE(UNIT,770) I,A(I,ITOT)
60    RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE APPROX                                             *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE APPROX
C *** VARS FORTRAN
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** VAR2 FORTRAN
      REAL Q(00550,00550)
      COMMON /SIX/ Q
C *** PRTFMT FORTRAN
C     THIS SECTION IS USED TO SHARE THE "FORMATS" USED IN THE
C     PRINT, APPROX, AND PRTMAT SUBROUTINES.
C
C     IWIDE  : THE NUMBER OF DIGITS PER COLUMN          (DEFAULT 15)
C     ICOL   : THE NUMBER OF COLUMNS PER PAGE OF OUTPUT (DEFAULT 5)
C     IDEC   : THE NUMBER OF DECIMAL POINTS             (DEFAULT 5)
C     LPP    : THE NUMBER OF LINES PER PAGE OF OUTPUT   (DEFAULT 66)
C     HEADER : UPTO 3 HEADINGS CAN BE USED ON THE TOP OF EACH PAGE
C     FOOTER : ONLY 1 FOOTER CAN BE USED ON THE BOTTOM OF EACH PAGE
C     FMT1   : THE FORTRAN FORMAT TO DISPLAY THE COLUMN NUMBERS
C     FMT2   : THE FORTRAN FORMAT TO DISPLAY THE DATA
C
      CHARACTER*80 FMT1,FMT2,HEADER(3),FOOTER
      COMMON /PRTFMT/ IWIDE,ICOL,IDEC,LPP,HEADER,FOOTER,FMT1,FMT2
      CHARACTER*16 APPX
      CHARACTER*32 ICODE(4),JCODE(3),KCODE(4),LCODE(5)
      INTEGER UNIT,DETAIL
      DATA APPX/'APPROX '/
      DATA ICODE/'STEP    ','RUN     ','OPTIONS','STOP '/
      DATA JCODE/'TERMINAL','PRINTER ','STOP    '/
      DATA KCODE/'DIRECT  ','WORKING','TOTALS','STOP  '/
      DATA LCODE/'DETAIL','NODETAIL','CHANGE','SAVE','STOP'/
C
C     INITIALIZE CONSTANTS
      LIMIT=20
      DETAIL=2
      NRFM=NR+1
      DO 100 I=1,NR
         Q(I,1)=0.0
         Q(I,120)=0.0
100   CONTINUE
C
C     ***************************************************************
C     *  ENTER THE IMPACT AMOUNTS INTO ANY SECTOR                   *
C     ***************************************************************
150   CALL READD(1,1,YL(1),Y(1),YU(1),KK,11,0,0,APPX)
      GOTO (160,150,150,180),KK
160   CALL READD(1,1,YL(3),Y(2),YU(3),KK,106,0,0,APPX)
      GOTO (170,150,150,180),KK
170   IS=Y(1)
      Q(IS,1 )=Y(2)
```

```
      Q(IS,120)=Y(2)
      GOTO 150
180   ICS=0
C
C     DETERMINE THE OUTPUT DEVICE. THE PRINTER OR CONSOLE.
      UNIT = 6
      CALL ANSW(3,JCODE,K1,58,0,0,APPX)
      GOTO (200,190,60,200), K1
190   UNIT = 8
C
C     ****************************************************************
C     *  MAIN LOOP OF APPROX.                                        *
C     ****************************************************************
C     DISPLAY THE STEP, RUN, OPTIONS OR STOP MESSAGE
200   CALL ANSW(4,ICODE,J1,93,ICS,0,APPX)
      GOTO (210,240,220,60),J1
210   ISTP=1
      GOTO 250
C     DISPLAY THE OPTIONS MENU
220   CALL ANSW(5,LCODE,L1,85,0,0,APPX)
      GOTO (230,230,410,300,60),L1
230   DETAIL=L1
      GOTO 200
240   ISTP=LIMIT-ICS
250   IF (ICS.GE.100) GOTO 430
      ICOL=ICS
      DO 290 N=1,ISTP
         ICOL=ICOL+1
         DO 260 I=1,NR
         Q(I,ICOL+1)=0.0
260      CONTINUE
         DO 280 J=1,NR
            DO 270 I=1,NR
               R(I,J)=Q(J,ICOL)*A(I,J)
               Q(I,ICOL+1)=Q(I,ICOL+1)+R(I,J)
               Q(I,120)=Q(I,120)+R(I,J)
270         CONTINUE
280      CONTINUE
290   CONTINUE
C     DISPLAY WORKING MATRIX OF MARGINAL IMPACTS
      IF (DETAIL.EQ.1) THEN
         NRFM=0
         HEADER(1)='MARGINAL IMPACTS MATRIX'
         HEADER(2)='DEFAULT'
         CALL PRTMAT(R,MAXR,MAXR,1,NR,1,NR,NRFM,UNIT)
         WRITE (UNIT,*)
         ENDIF
C     DISPLAY TOTAL SECTOR IMPACTS.
      CALL APPPRT(Q,MAXR,MAXR,NR,ICS,ICOL,170,NAME,UNIT)
      WRITE (UNIT,*)
      ICS=ICOL
      IF (J1.EQ.1) LIMIT=MIN(100,LIMIT+1)
```

```
      IF (J1.EQ.2) LIMIT=MIN(100,LIMIT+20)
      GOTO 200
C     ****************************************************************
C     *  SAVE THE DIRECT REQUIREMENTS, WORKING, OR TOTALS MATRIX     *
C     ****************************************************************
C     *                                                              *
300   CALL ANSW(4,KCODE,J1,64,0,0,APPX)
      I=0
      GOTO (310,320,330,60,200),J1
C     SAVE THE DIRECT REQUIREMENTS MATRIX
310   CALL PUTMAT (Q,NR,NC,5,I)
      GOTO 200
C     SAVE THE WORKING MATRIX
320   CALL PUTMAT (R,NR,NC,5,I)
      GOTO 200
C     SAVE THE TOTALS MATRIX
330   J=ICOL+2
      DO 340 I=1,NR
340   Q(I,J)=Q(I,120)
      CALL PUTMAT (Q,NR,J,5,I)
      GOTO 200
C     ****************************************************************
C     *  CHANGE A CELL IN THE DIRECT REQUIREMENTS TABLE              *
C     ****************************************************************
C     *                                                              *
410   CALL READD(3,3,YL,Y,YU,KK,94,0,0,APPX)
      GOTO (420,410,410,200),KK
420   IR=Y(1)
      IC=Y(2)
      A(IR,IC)=Y(3)
      GOTO 410
C     ****************************************************************
C     *  ITERATION EXCEEDED. INCREASE FOR 30 MORE                    *
C     ****************************************************************
430   WRITE(*,440)
440   FORMAT(/,' ITERATION LIMIT OF 100 EXCEEDED.',/)
      GOTO 200
C     ****************************************************************
60    UNIT = 6
      HEADER(1)='DEFAULT'
      RETURN
      END
C     ****************************************************************
C     *       SUBROUTINE BALANC                                      *
C     ****************************************************************
      SUBROUTINE BALANC
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
```

```
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     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*16 BALX,BALOX
      COMMON /SIX/GOC(00550),GOR(00550),CTC(00550),CTR(00550),
     *            CDIV(00550),RDIV(00550)
      DATA BALX,BALOX/'BALANCE ','BALANCEO'/
10    NITER=0
      ISAVE=1
20    CALL READD (NR,NR,RL,CTC,RU,KK,19,NR,0,BALX)
      GOTO(30,20,20,900,10,20,20),KK
30    CALL READD (NC,NC,RL,CTR,RU,KK,20,NC,0,BALX)
      GOTO(40,30,30,900,10,30,30),KK
40    DIFFER=0.0
      SUM=0.0
      DO 50 I=1,NR
50    SUM=SUM+CTC(I)
      DO 60 J=1,NC
60    DIFFER=DIFFER+CTR(J)
      IF (SUM.NE.DIFFER) THEN
        WRITE (6,*) ' THE ROW    CONTROL TOTAL SUM =',SUM
        WRITE (6,*) ' THE COLUMN CONTROL TOTAL SUM =',DIFFER
        WRITE (6,*) ' RE-ENTER THE CONTROL TOTALS'
        ERR=1
        GOTO 20
        ENDIF
100   DIFFER=0.0
C     FIND THE SUM OF THE COLUMNS ACROSS ROWS
      DO 330 I = 1,NR
      GOC(I)=0.0
      DO 330 J = 1,NC
330   GOC(I) = GOC(I) + A(I,J)
      DO 340 I = 1,NR
      IF(GOC(I).EQ.0.) THEN
        CDIV(I) = 0.
        ELSE
        CDIV(I) = CTC(I)/GOC(I)
        DIFFER=MAX(DIFFER,ABS(CTC(I)-GOC(I)))
        DO 350 J=1,NC
350     A(I,J)=A(I,J)*CDIV(I)
        ENDIF
340   CONTINUE
C     FIND THE SUM OF THE ROWS
      DO 360 J = 1,NC
      GOR(J)=0.0
      DO 360 I = 1,NR
360   GOR(J) = GOR(J) + A(I,J)
      DO 380 J = 1,NC
      IF(GOR(J).EQ.0.) THEN
        RDIV(J) = 0.
        ELSE
        RDIV(J) = CTR(J)/GOR(J)
```

```
        DIFFER=MAX(DIFFER,ABS(CTR(J)-GOR(J)))
        DO 370 I=1,NR
370     A(I,J)=A(I,J)*RDIV(J)
        ENDIF
380   CONTINUE
      NITER = NITER + 1
580   IF (NITER.GT.20) GOTO780
      IF (DIFFER.GT. .01) GOTO 100
610   WRITE (6,620)
620   FORMAT(/,' THE MATRIX IS NOW BALANCED.',/)
630   CALL RESPND(KK,3,21,0,0,BALOX)
      GOTO (650,690,630,630),KK
650   NR=NR+1
      NC=NC+1
      DO 660 J = 1,NC-1
660   A(NR,J) = GOR(J)
      SUM=0.0
      DO 670 I = 1,NR-1
      SUM=SUM+GOC(I)
670   A(I,NC) = GOC(I)
      A(NR,NC) = SUM
690   CALL RESPND(KK,4,22,0,0,BALOX)
      GOTO (710,750,690,690),KK
710   NC = NC + 1
      NR = NR + 1
      SUM=0.0
      DO 730 I = 1,NC-1
730   A(NR,I) = CTR(I)
      DO 740 I = 1,NR-1
      SUM  = SUM + CTC(J)
740   A(I,NC) = CTC(I)
      A(NR,NC) = SUM
750   GOTO 800
780   WRITE(6,790)
790   FORMAT(/,' THE BALANCING ROUTINE HAS GONE THROUGH THE MAXIMUM NUMB
     *ER',/,' OF ITERATIONS AND IS NOT BALANCED WITHIN THE ESTABLISHED',
     */,' LIMITS.',/)
      GOTO630
800   CALL RESPND(KK,4,23,0,0,BALX)
      GOTO (820,900,800,800),KK
820   WRITE(6,860) 'ROW'
      DO 850 I=1,NR
      TDIF=CTC(I)-GOC(I)
      WRITE(6,840) I,CTC(I),GOC(I),TDIF
840   FORMAT(I3,3F15.6)
850   CONTINUE
      WRITE(6,860) 'COL'
860   FORMAT(/,1X,A3,'  CONTROL TOTAL   GROSS OUTLAY     DIFFERENCE',/)
      DO 880 J = 1,NC
      TDIF = CTR(J) - GOR(J)
      WRITE(6,840) J,CTR(J),GOR(J),TDIF
880   CONTINUE
```

```
900   RETURN
      END
C     ***************************************************************
C     *       SUBROUTINE BUILD                                      *
C     ***************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE BUILD
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      CHARACTER*16 BLDX
      CHARACTER*32 FN,JCODE(5)
      DATA BLDX/'BUILD '/
      DATA JCODE/'TRANSACTION','DIRECT ','TOTAL ','DATA '
     *          ,'STOP '/
801   CALL READFN(FN,IT,24,0,0,BLDX)
      IF (FN.EQ.'STOP') GOTO 60
      NAME=FN
802   CALL ANSW(5,JCODE,IT,25,0,0,BLDX)
805   ITYPE=IT
      IF (ITYPE.EQ.4) ITYPE=5
800   CALL READN2(1,1,0.,Z,FLOAT(MAXR),KK,26,0,0,BLDX)
      GOTO(820,800,800,60,800,800,800),KK
820   NR=Z
      NC=0
      ISAVE=1
100   NCC=NC+1
      CALL READD(NR,NR,RL,B,RU,KK,5,NR,NCC,'ADDCOL          ')
      GOTO(120,100,100,60,100,100,100),KK
120   IF (NC.EQ.MAXR) THEN
         CALL MSG(80,MAXR,0)
         GOTO 60
         ENDIF
      NC=NC+1
      DO 130 I=1,NR
130   A(I,NC)=B(I)
      ISAVE=1
      GOTO100
60    RETURN
      END



C     ***************************************************************
C     *       SUBROUTINE CHANGE                                     *
```

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C     ***********************************************************************
      SUBROUTINE CHANGE
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*16 CHANX
      DATA CHANX/'CHANGE '/
420   CALL READD(2,2,YL(1),Y(1),YU(1),KK,27,0,0,CHANX)
      GOTO(430,450,420,60,420,420,420),KK
430   CALL READD(1,1,YL(3),Y(3),YU(3),KK,106,0,0,CHANX)
      GOTO(440,450,430,60,430,430,430),KK
440   I=Y(1)
      J=Y(2)
      IF(I.GT.NR)GOTO450
      IF(J.GT.NC)GOTO450
      A(I,J)=Y(3)
      ISAVE=1
      GOTO420
450   CALL MSG(28,0,0)
      CALL INFO
      GOTO420
60    RETURN
      END

C     ***********************************************************************
C     *       SUBROUTINE COLLAP                                             *
C     ***********************************************************************
      SUBROUTINE COLLAP
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*32 ICODE(3)
      CHARACTER*16 COLX
      DATA COLX/'COLLAPSE '/
      DATA ICODE/'ROWS    ','COLUMNS ','STOP    '/
30    CALL ANSW(3,ICODE,JA,29,0,0,COLX)
      GOTO (50,140,210,30),JA
C     ***********************************************************************
C     *       COLLAPSE ROWS                                                 *
C     ***********************************************************************
```

```
50    UPPER=NR
      CALL READN2(2,2,1.0,X,UPPER,KK,30,0,0,COLX)
      GOTO(70,50,50,210),KK
70    NRS = X(1)
      NRF = X(2)
      IF (NRS.GE.NRF) GOTO 900
C     COLLAPSE THE ROWS ONE COLUMN AT A TIME
80    DO 110 J=1,NC
C     SUM THE COLUMN
      DO 90 I=NRS+1,NRF
90    A(NRS,J)=A(NRS,J)+A(I,J)
C     MOVE THE REMAINING ROWS UP
      DO 100 I=1,NR-NRF
100   A(I+NRS,J)=A(I+NRF,J)
110   CONTINUE
      NR=NR-NRF+NRS
      GOTO 50
C     ***********************************************************************
C     *       COLLAPSE COLUMNS                                              *
C     ***********************************************************************
140   UPPER=NC
      CALL READN2(2,2,1.0,X,UPPER,KK,32,0,0,COLX)
      GOTO(160,140,140,210),KK
160   NCS = X(1)
      NCF = X(2)
      IF (NCS.GE.NCF) GOTO 900
C     OPERATE ON THE COLUMNS ONE ROW AT A TIME
170   DO 200 I=1,NR
C     SUM THE COLUMNS
      DO 180 J=NCS+1,NCF
180   A(I,NCS)=A(I,NCS)+A(I,J)
C     SHIFT THE OTHER DATA TO THE LEFT
      DO 190 J=1,NC-NCF
190   A(I,NCS+J)=A(I,NCF+J)
200   CONTINUE
      NC=NC-NCF+NCS
      GOTO140
900   CALL MSG (16,0,0)
210   ISAVE=1
      RETURN
      END
C$DEBUG
C     ***********************************************************************
C     *       SUBROUTINE DELETE                                             *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE DELETE
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
```

```
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       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      CHARACTER*16 DELX
      CHARACTER*32 ICODE(4),JCODE(3)
      DATA DELX/'DELETE '/
      DATA ICODE/'ROWS ','COLUMNS ','ELEMENT ','STOP '/
      DATA JCODE/'ROW     ','COLUMN  ','STOP    '/
10    IF (MSGON) CALL INFO
      CALL ANSW(4,ICODE,JA,33,0,0,DELX)
      GOTO (400,440,100,60,10 ),JA
C     ************************************************************************
C     *  DELETE AN ELEMENT                                                   *
C     ************************************************************************
100   CALL ANSW(3,JCODE,JA,36,0,0,DELX)
      GOTO (110,110,60,100,100),JA
110   CALL READN2(2,2,XL,X,XU,KK,37,0,0,DELX)
      GOTO (120,110,110,60,110,110,110),KK
120   ISAVE=1
      IF (JA.EQ.2) GOTO 150
      NRT=X(1)
      NCT=X(2)
      NM=NC-NCT
      IF (NM.EQ.0) GOTO 140
      DO 130 I=1,NM
130   A(NRT,NCT+I-1)=A(NRT,NCT+I)
140   A(NRT,NC)=0.0D0
      GOTO 10
150   NCT=X(2)
      NRT=X(1)
      NM=NR-NRT
      IF (NM.EQ.0) GOTO 270
      DO 160 I=1,NM
160   A(NRT+I-1,NCT)=A(NRT+I,NCT)
270   A(NR,NCT)=0.0D0
      GOTO 10
C     ************************************************************************
C     *  DELETE A SERIES OF ROWS OR COLUMNS                                  *
C     ************************************************************************
400   CALL READN2(2,2,XL,X,XU,KK,34,0,0,DELX)
      GOTO (410,400,400,10 ,60,400,400),KK
410   NRS = X(1)
      NRF = X(2)
      NR1=NRS
      NR2=NRF-NRS+1
```

```
      NR3=NRF+1
      ISAVE=1
420   DO 430 J=1,NC
430   A(NR1,J)=A(NR3,J)
      NR1=NR1+1
      NR3=NR3+1
      IF(NR1.LE.NR)GOTO 420
      NR=NR-NR2
      GOTO 10
440   CALL READN2(2,2,XL,X,XU,KK,35,0,0,DELX)
      GOTO (450,440,440,10 ,10 ,440,440),KK
450   NCS = X(1)
      NCF = X(2)
      NC1=NCS
      NC2=NCF-NCS+1
      NC3=NCF+1
      ISAVE=1
460   DO 470 I=1,NR
470   A(I,NC1)=A(I,NC3)
      NC1=NC1+1
      NC3=NC3+1
      IF(NC1.LE.NC)GOTO 460
      NC=NC-NC2
      GOTO 10
60    RETURN
      END
      SUBROUTINE ERAINX
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      CHARACTER*1  INDFN1(12),INDNM1(10),INDX1(42)
      CHARACTER*10 INDNAM
      CHARACTER*12 INDFN,NAMTST
      CHARACTER*32 FNAME
      CHARACTER*42 INDX
      CHARACTER*68 DESCR
      LOGICAL      LEXIST
      EQUIVALENCE (INDNAM,INDNM1),(INDFN1,INDFN),(INDX,INDX1)
      DATA INDNAM/'SAM.INX'/
C
      FNAME=TOKARR(1)
      TOKARR(1)='END '
C     SEARCH FNAME FOR A PATH NAME LOOKING FOR ':' OR '\'
      DO 10 I=32,1,-1
      IF (INDFN1(I).EQ.':' .OR. INDFN1(I).EQ.'\') GOTO 20
10    CONTINUE
      INDX=INDNAM
      INDFN=FNAME
```

```
      GOTO 55
C
C     SEPARATE THE FILE NAME FROM THE PATH
20    INDX=FNAME
      DO 30 J=1,12
30    INDFN1(J)=INDX1(J+I)
C
      DO 40 J=I+1,I+10
40    INDX1(J)=INDNM1(J-I)
C
      DO 50 J=I+11,42
50    INDX1(J)=' '
C
C     CHECK IF THE SAM.INX FILE EXISTS
55    INQUIRE(FILE=INDX,EXIST=LEXIST)
      I=0
C *** FOR IBM MAIN FRAME ONLY *** NEXT STATEMENT
C     LEXIST=.TRUE.
      IF (LEXIST) THEN
C        LOOK FOR THE THE MATCH OF THE FILE NAME IN SAM.INX
         OPEN(10,FILE=INDX,FORM='FORMATTED',ACCESS='DIRECT',RECL=80)
         DO 70 I=1,999
            READ(10,60,REC=I,ERR=80) NAMTST,DESCR
60          FORMAT(A12,A68)
            IF(NAMTST.EQ.INDFN) THEN
            NAMTST=' '
            WRITE(10,60,REC=I,ERR=80) NAMTST,DESCR
              GOTO 80
              ENDIF
70       CONTINUE
         ELSE
            GOTO 80
         ENDIF
C
80    RETURN
      END
C$DEBUG
C$DEBUG
      SUBROUTINE HELP(NEED)
      CHARACTER*16 NEED4*4,NEED,LINE*80,LCODE(40)*4
      INTEGER*2 IPOINT(40),COUNT
C     ****************************************************************
C
C     CHECK IF THE SCREEN IS ALREADY DEFINED
      IF (COUNT.GT.0) GOTO 100
      READ (10,30,REC=1) (LCODE(I),IPOINT(I),I=1,10)
      READ (10,30,REC=2) (LCODE(I),IPOINT(I),I=11,20)
      READ (10,30,REC=3) (LCODE(I),IPOINT(I),I=21,30)
      READ (10,30,REC=4) (LCODE(I),IPOINT(I),I=31,40)
30    FORMAT(10(A4,I4))
      DO 40 COUNT=1,40
      IF (LCODE(COUNT).EQ.' ') GOTO 50
```

```
40    CONTINUE
50    COUNT=COUNT-1
C
C     ****************************************************************
C
C     DETERMINE THE HELP SCREEN TO DISPLAY
100   NEED4=NEED
      DO 110 K=1,COUNT
      IF (NEED4.EQ.LCODE(K)) GOTO 150
110   CONTINUE
C     IF THE MATCH IS NOT FOUND DISPLAY THE HELP MENU
      K=1
C     ENDIF
150   DO 200 L=IPOINT(K),IPOINT(K+1)-1
      READ (10,205,REC=L,ERR=220) LINE
205   FORMAT (A80)
      WRITE(6,210) LINE
210   FORMAT(1X,A79)
200   CONTINUE
      WRITE (6,*) ' '
220   RETURN
      END
      SUBROUTINE INDEX
      CHARACTER*42 FNAME,INDX*16,NAME*10,LINE*70,LIST*10
      CHARACTER*1  FN1(42),NAME1(10)
      LOGICAL      LEXIST,SLASH
      EQUIVALENCE (FNAME,FN1),(NAME,NAME1)
      DATA INDX/'INDEX '/,NAME/'SAM.INX'/
C
      FNAME=' '
      SLASH=.FALSE.
C     FIND THE PATH NAME
      CALL READFN(FNAME,I,42,0,0,INDX)
      IF (FNAME.EQ.'STOP') GOTO 110
C     WRITE (6,*) 'ENTER THE PATH NAME'
C
C     PRECEDE THE INDEX FILE NAME WITH THE PATH. (LOOK FOR BLANKS)
      DO 10 I=1,32
      IF (FN1(I).EQ.' ') GOTO 20
      IF (FN1(I).EQ.'\') SLASH=.TRUE.
10    CONTINUE
      I=33
C
C     MOVE THE FILE NAME TO FNAME
20    IF (SLASH) THEN
         IF (FN1(I-1).NE.'\') THEN
            FN1(I)='\'
            ELSE
            I=I-1
            ENDIF
         ELSE
         I=I-1
```

```
         ENDIF
      DO 30 J=1,10
30    FN1(I+J)=NAME1(J)
C
C     CHECK IF THE FILE EXISTS
      WRITE (6,*) ' '
      INQUIRE(FILE=FNAME,EXIST=LEXIST)
C *** FOR IBM MAIN FRAME ONLY *** NEXT 2 LINES
C     LEXIST=.TRUE.
C     FNAME='INDEX'
      IF (.NOT.LEXIST) THEN
         WRITE (6,*) 'THERE IS NO DESCRIPTION INDEX FOR FILES ON ',
     *               'DRIVE ',(FN1(J),J=1,I)
         GOTO 110
         ENDIF
C
C     READ AND DISPLAY FILE INFORMATION
      OPEN (1,FILE=FNAME,ACCESS='DIRECT',FORM='FORMATTED',RECL=80)
40    READ(1,50,ERR=100,END=100) LIST,LINE
50    FORMAT(A10,A70)
      IF (LIST.EQ.' ') GOTO 40
      WRITE (6,60) LIST,LINE
60    FORMAT (1X,A10,A69)
      GOTO 40
C
100   CLOSE (1)
110   WRITE (6,*) ' '
      RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE INSERT                                             *
C     ***********************************************************************
      SUBROUTINE INSERT
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*16 INSX
      CHARACTER*32 ICODE(3)
      DATA INSX/'INSERT '/
      DATA ICODE/'ROW     ','COLUMN  ','STOP    '/
100   CALL ANSW(3,ICODE,JA,39,0,0,INSX)
      IF (JA.EQ.4) GOTO 100
      IF (JA.EQ.3) GOTO 60
110   CALL READD(2,2,YL(1),Y(1),YU(1),KK,40,0,0,INSX)
      GOTO (115,110,110,60,110,110,110),KK
115   CALL READD(1,1,YL(3),Y(3),YU(3),KK,106,0,0,INSX)
```

```
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      GOTO (120,110,110,60,110,110,110),KK
120   ISAVE=1
      IF (JA.EQ.2) GOTO 220
      NRT=Y(1)
      NCT=Y(2)
      NM=NC-NCT
      IF (NM.EQ.0) GOTO 122
      DO 121 I=1,NM
121   A(NRT,NC-I+1)=A(NRT,NC-I)
122   A(NRT,NCT)=Y(3)
      GOTO 100
220   NCT=Y(2)
      NRT=Y(1)
      NM=NR-NRT
      IF (NM.EQ.0) GOTO 222
      DO 221 I=1,NM
221   A(NR-I+1,NCT)=A(NR-I,NCT)
222   A(NRT,NCT)=Y(3)
      GOTO 100
60    RETURN
      END
      SUBROUTINE LIFO (ALPHA,J1,N)
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      CHARACTER*1 ALPHA(32)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      LOGICAL LEXIST
C
C     CHECK IF THERE IS ROOM TO PLACE THE ARRAY IN TOKARR FRONT END
      IF (N.GE.NEXT) THEN
         LENGTH=N-NEXT+1
         LAST=LAST+LENGTH
         DO 10 I=NEXT+LENGTH,LAST
10       TOKARR(I)=TOKARR(I-LENGTH)
         NEXT=1
         ELSE
         NEXT=NEXT-N
         ENDIF
      DO 20 I=NEXT,NEXT+N-1
20    TOKARR(I)=ALPHA(I-NEXT+J1)
C     WRITE (*,12) NEXT,LAST,N
      RETURN
      END
C     ****************************************************************
C     *  LINV   SUBROUTINE  (LEONTIEF INVERSE TOTAL REQUIREMENTS)    *
C     ****************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE LINV
```

```
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C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      CALL RESPND(JA,3,3,0,0,'L-INVERSE           ')
40    GOTO (100,50,60),JA
100   DO 210 I=1,NR
      DO 200 J=1,NC
      A(I,J)=-A(I,J)
200   CONTINUE
      A(I,I)=1+A(I,I)
210   CONTINUE
      CALL INVERT
      ITYPE=3
      GOTO 60
50    CALL MSG(43,0,0)
60    RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE MOVE                                               *
C     ***********************************************************************
      SUBROUTINE MOVE
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*32 ICODE(3)
      CHARACTER*16 MOVEX
      DATA MOVEX/'MOVE '/
      DATA ICODE/'ROW     ','COLUMN  ','STOP    '/
1040  CALL ANSW(3,ICODE,JA,44,0,0,MOVEX)
      GOTO(1060,1220,60,1040),JA
1060  CALL READN2(1,1,0.,RO,FLOAT(MAXR),KK,45,0,0,MOVEX)
      GOTO (1080,1060,1060,60),KK
1080  NRO = RO
1090  CALL READN2(1,1,0.,RN,FLOAT(MAXR),KK,46,0,0,MOVEX)
      GOTO(1110,1090,1090,60),KK
1110  NRN = RN
      ISAVE=1
      DO1120 J = 1,NC
1120  B(J) = A(NRO,J)
      IF(NRO.LT.NRN)GOTO1160
      NR1=NRO
```

```
      NR2=NRO-1
1130  DO1140 J=1,NC
1140  A(NR1,J)=A(NR2,J)
      NR1=NR1-1
      NR2=NR2-1
      IF(NR2.GE.NRN) GOTO1130
      DO1150 J=1,NC
1150  A(NRN,J)=B(J)
      GOTO1060
1160  NR1=NRO
      NR2=NRO+1
1170  DO1180 J=1,NC
1180  A(NR1,J)=A(NR2,J)
      NR1=NR1+1
      NR2=NR2+1
      IF(NR2.LE.NRN)GOTO1170
      DO1190 J=1,NC
1190  A(NRN,J)=B(J)
      GOTO1060
1220  CALL READN2(1,1,0.,CO,FLOAT(MAXR),KK,48,0,0,MOVEX)
      GOTO(1240,1220,1220,60),KK
1240  NCO = CO
1250  CALL READN2(1,1,0.,CN,FLOAT(MAXR),KK,49,0,0,MOVEX)
      GOTO(1270,1250,1250,60),KK
1270  NCN = CN
      ISAVE=1
      DO1280 I = 1,NR
1280  B(I) = A(I,NCO)
      IF(NCO.LT.NCN)GOTO1320
      NC1 = NCO
      NC2 = NCO - 1
1290  DO1300 I = 1,NR
1300  A(I,NC1) = A(I,NC2)
      NC1 = NC1 - 1
      NC2 = NC2 - 1
      IF(NC2.GE.NCN) GOTO1290
      DO1310 I=1,NR
1310  A(I,NCN)=B(I)
      GOTO1220
1320  NC1=NCO
      NC2=NCO+1
1330  DO1340 I=1,NR
1340  A(I,NC1)=A(I,NC2)
      NC1=NC1+1
      NC2=NC2+1
      IF(NC2.LE.NCN)GOTO1330
      DO1350 I=1,NR
1350  A(I,NRN)=B(I)
      GOTO1220
60    RETURN
      END
C     ****************************************************************
```

```
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C     *       SUBROUTINE MSG (N1,N2                                          *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE MSG(N1,N2,N3)
      INTEGER MSGTAB(160,2),FLAG,NMSGS,LAST,N(2),N1,N2,N3
      CHARACTER*1   MSGFMT(84)
      CHARACTER*84  REALMS
      EQUIVALENCE (MSGFMT,REALMS)
      DATA REALMS/'(1X,'/,MSGFMT(84)/')'/
      IF (FLAG.NE.0) GOTO 1
      READ(3,101,REC=1) NMSGS,LAST,MSGTAB
101   FORMAT(2I4,/,15(20I4,/),20I4)
      FLAG=1
1     IF (N1.LT.1.OR.N1.GE.NMSGS) RETURN
      WRITE(*,102)
102   FORMAT(1X)
      KK=MSGTAB(N1,1)
      LL=MSGTAB(N1,2)
      DO 100 I=1,LL
         READ(3,103,REC=KK) K,(MSGFMT(L),L=5,83)
103      FORMAT(I1,79A1)
25       FORMAT (1X,I5,85A1)
      MSGFMT(84)=')'
         IF (K.EQ.0) WRITE(*,REALMS)
         IF (K.EQ.1) WRITE(*,REALMS) N2
         IF (K.EQ.2) WRITE(*,REALMS) N2,N3
         J=J+K
         KK=KK+1
100   CONTINUE
      WRITE(*,102)
60    RETURN
      END
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE MULPLY
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** VAR2 FORTRAN
      REAL Q(00550,00550)
      COMMON /SIX/ Q
      CHARACTER*32 ICODE(6),JCODE(3),KCODE(3),LCODE(3)
      CHARACTER*16 MULTX
      DATA MULTX/'MULTIPLIER'/
      DATA ICODE/'EMPLOYMENT','OUTPUT','INCOME','INDUSTRY','SUPPLY',
     *           'STOP '/
      DATA JCODE/'SIMPLE','FULL','STOP '/
      DATA KCODE/'CALCULATE','GET','STOP '/
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

      DATA LCODE/'1','2','STOP '/
C     TEST FOR DIRECT REQUIREMENTS TABLE
      IF (ITYPE.NE.2 .AND. ITYPE.NE.5) CALL MSG(110,0,0)
C     DETERMINE WHICH TYPE OF MULTIPLIER TO USE
10    CALL ANSW(6,ICODE,K1,113,0,0,MULTX)
      IF (K1.EQ.6) GOTO 60
C     CHECK IF THE INVERSE ALREADY EXISTS
14    CALL ANSW(3,KCODE,K3,120,0,0,ICODE(K1))
      IF (K3.EQ.2 .AND. K1.NE.3) GOTO 36
      IF (K3.EQ.3) GOTO 60
C
C     CHECK FOR SIMPLE OR FULL MULTIPLIER
      IF (K1.EQ.3 .OR. K1.EQ.1) THEN
         CALL ANSW(3,LCODE,K2,108,0,0,ICODE(K1))
         ELSE
         CALL ANSW(3,JCODE,K2,114,0,0,ICODE(K1))
         ENDIF
      IF (K2.EQ.3) GOTO 60
C
C     IS THE HOUSEHOLD ROW INCLUDED?
15    CALL RESPND(K4,3,115,0,0,ICODE(K1))
      IF (K4.EQ.3) GOTO 60
      IF (K2.EQ.2 .AND. K4.EQ.2) GOTO 900
      IF (K1.EQ.3 .AND. K4.EQ.2) GOTO 900
      IF (K4.EQ.2) GOTO 18
C
C     GET THE HOUSEHOLD ROW NUMBER AND SET THE NUMBER OF ROWS
      CALL READN2(1,1,0.,Z,FLOAT(MAXR),KK,112,0,0,ICODE(K1))
      NR=Z
      NR1=NR
      IF (K2.EQ.1) NR=NR-1
C
C     ENTER THE PHYSICAL LABOR INPUT COEFFICIENTS
18    IF (K1.EQ.1) THEN
         CALL READD(NR,NR,RL,B,RU,KK,117,NR,0,ICODE(K1))
         ENDIF
C
C     COPY THE HOUSEHOLD SECTOR INTO VECTOR B FOR THE INCOME MULTIPLIERS
      IF (K1.EQ.3) THEN
         DO 20 J=1,NC
20       B(J)=A(NR1,J)
         ENDIF
C
30    IF (NC.LT.NR) THEN
         CALL MSG(111,0,0)
         CALL INFO
         ERR=1
         RETURN
         ENDIF
      NC=NR
36    GOTO (31,35,60),K3
C     PREPARE FOR LEONTIEF INVERSE
```

```
31    DO 34 I=1,NR
      DO 32 J=1,NC
32    A(I,J)=-A(I,J)
34    A(I,I)=A(I,I)+1.0
      CALL INVERT
      GOTO 39
35    CALL GETMAT(A,NR,NC,ITYPE,ISAVE,0,ICODE(K1))
C
C     BRANCH TO THE MULTIPLIER OPTIONS
39    ITYPE=3
      GOTO (410,210,410,110,310),K1
C
C     EMPLOYMENT AND INCOME MULTIPLIERS
C     FINAL DEMAND MULTIPLIERS
410   NR=NR+1
      DO 430 J=1,NC
      A(NR,J)=0
      IF (B(J) .EQ. 0.0) GOTO 430
      DO 420 I=1,NC
      A(I,J)=A(I,J)*B(I)/B(J)
      A(NR,J)=A(NR,J)+A(I,J)
420   CONTINUE
430   CONTINUE
      GOTO 60
C
C     OUTPUT MULTIPLIERS
C     DIVIDE THE COLUMNS BY THE DIAGONAL ELEMENTS
110   NR=NR+1
      DO 120 J=1,NC
      Z=A(J,J)
      A(NR,J)=0
      DO 120 I=1,NC
      A(I,J)=A(I,J)/Z
      A(NR,J)=A(NR,J)+A(I,J)
120   CONTINUE
      GOTO 60
C
C     FINAL DEMAND MULTIPLIERS
210   NR=NR+1
      DO 220 J=1,NC
      A(NR,J)=0
      DO 220 I=1,NC
      A(NR,J)=A(NR,J)+A(I,J)
220   CONTINUE
      GOTO 60
C
C     SUPPLY MULTIPLIERS
310   NR=NR+1
      DO 320 J=1,NC
      A(NR,J)=0
      DO 320 I=1,NC
      A(NR,J)=A(NR,J)+A(J,I)
```

```
320   CONTINUE
      GOTO 60
C     ERRORS
900   WRITE(*,910)
910   FORMAT(' ** ERROR **  THE HOUSEHOLD SECTOR MUST BE INCLUDED FOR',
     *       ' THIS OPERATION.')
60    RETURN
      END

C$DEBUG
C     ************************************************************************
C     *       SUBROUTINE NORMAL    (NORMALIZE A MATRIX)                      *
C     ************************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE NORMAL
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      INTEGER KK,I,JA,JB,NRT,NCT
      CHARACTER*32 JCODE(3)
      CHARACTER*16 NORMX
      DATA JCODE/'ROW     ','COLUMN  ','STOP '/
      DATA NORMX/'NORMAL '/
      NRT=0
      NCT=0
C     ASK IF ROW OR COLUMN TOTALS WILL BE USED
10    CALL ANSW(3,JCODE,JB,95,0,0,NORMX)
      GOTO (200,100,60,10),JB
C
C     ASK ABOUT COLUMN TOTALS - DIRECT REQUIREMENTS
100   CALL RESPND(KK,3,97,0,0,NORMX)
      GOTO (130,110,60,60),KK
C     CREATE THE COLUMN TOTALS AND PLACE IN NR+1 ROW
110   NRT=NR+1
      DO 120 J=1,NC
         A(NRT,J)=0.0
         DO 115 I=1,NR
115      A(NRT,J)=A(NRT,J)+A(I,J)
120   CONTINUE
      GOTO 150
C     SINCE THE COLUMN TOTALS EXIST. ASK WHAT ROW THEY ARE IN.
130   CALL READN2(1,1,XL,X,FLOAT(NR),KK,99,0,0,NORMX)
      GOTO (140,130,130,60),KK
140   NRT=X(1)
C
C     CREATE THE DIRECT REQUIREMENTS
150   DO 160 J=1,NC
```

```
         IF (A(NRT,J).EQ.0.0) THEN
            VALUE=0.0
            ELSE
            VALUE=1.0/A(NRT,J)
            ENDIF
         DO 160 I=1,NRT-1
160      A(I,J)=A(I,J)*VALUE
      NR=NRT-1
      GOTO 300
C
C     ASK ABOUT ROW TOTALS - SUPPLY SIDE
200   CALL RESPND(KK,3,96,0,0,NORMX)
      GOTO (230,210,60,60),KK
C     CREATE THE ROW TOTALS AND PLACE IN NC+1 COLUMN
210   NCT=NC+1
      DO 220 I=1,NR
         A(I,NCT)=0.0
         DO 215 J=1,NC
215      A(I,NCT)=A(I,NCT)+A(I,J)
220   CONTINUE
      GOTO 250
C     SINCE THE ROW TOTALS EXIST. ASK WHAT COLUMN THEY ARE IN.
230   CALL READN2(1,1,XL,X,FLOAT(NC),KK,98,0,0,NORMX)
      GOTO (240,230,230,60),KK
240   NCT=X(1)
C
C     CREATE THE DIRECT OUTPUT COEFFICIENTS
250   DO 260 I=1,NR
         IF (A(I,NCT).EQ.0.0) THEN
            VALUE=0.0
            ELSE
            VALUE=1.0/A(I,NCT)
            ENDIF
         DO 260 J=1,NCT-1
260      A(I,J)=A(I,J)*VALUE
      NC=NCT-1
C
300   ITYPE=2
      ISAVE=1
      CALL INFO
60    RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE PRINT                                              *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE PRINT(IUNIT)
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
```

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       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** PRTFMT FORTRAN
C     THIS SECTION IS USED TO SHARE THE "FORMATS" USED IN THE
C     PRINT, APPROX, AND PRTMAT SUBROUTINES.
C
C     IWIDE  : THE NUMBER OF DIGITS PER COLUMN          (DEFAULT 15)
C     ICOL   : THE NUMBER OF COLUMNS PER PAGE OF OUTPUT (DEFAULT 5)
C     IDEC   : THE NUMBER OF DECIMAL POINTS             (DEFAULT 5)
C     LPP    : THE NUMBER OF LINES PER PAGE OF OUTPUT   (DEFAULT 66)
C     HEADER : UPTO 3 HEADINGS CAN BE USED ON THE TOP OF EACH PAGE
C     FOOTER : ONLY 1 FOOTER CAN BE USED ON THE BOTTOM OF EACH PAGE
C     FMT1   : THE FORTRAN FORMAT TO DISPLAY THE COLUMN NUMBERS
C     FMT2   : THE FORTRAN FORMAT TO DISPLAY THE DATA
C
      CHARACTER*80 FMT1,FMT2,HEADER(3),FOOTER
      COMMON /PRTFMT/ IWIDE,ICOL,IDEC,LPP,HEADER,FOOTER,FMT1,FMT2
      CHARACTER*1  SETUP(30),LINE(80),FN32(32)
      CHARACTER*16 PRINTX
      CHARACTER*32 ICODE(4),JCODE(12),XTYPE(5),FN
      CHARACTER*80 LINE80
      LOGICAL      LOPEN,DEFLT,LEXIST
      EQUIVALENCE  (LINE80,LINE),(FN,FN32)
      DATA ICODE/  'YES','NO','FORMAT','STOP'/
      DATA JCODE/  'COLUMNS', 'DECIMAL', 'LENGTH', 'WIDTH', 'SETUP',
     *             'HEADER',  'FOOTER',  'DEFAULT','CLEAR', 'FILE',
     *             'STATUS',  'STOP'/
      DATA XTYPE/  'TRANSACTIONS MATRIX','DIRECT REQUIREMENTS TABLE',
     *             'TOTAL REQUIREMENTS TABLE',' ',
     *             'DATA MATRIX'/
      DATA PRINTX/ 'PRINT'/
      JUNIT=IUNIT
      NRS=1
      NRF=NR
      NCS=1
      NCF=NC
      NRFM=0
      DEFLT=.FALSE.
C     SET 'MULTIPLIERS' FLAG ON IF THE DATA TYPE IS "TOTAL"
      IF (ITYPE.EQ.3.AND.NR.GT.NC) NRFM=NC+1
      IF (ITYPE.GE.6 .AND. NR.LE.NC) ITYPE=3
C     'DO YOU WANT TO PRINT THE ENTIRE MATRIX? (OR OPTIONS)'
100   CALL ANSW(4,ICODE,JA,55,0,0,PRINTX)
      GOTO (500,130,200,60),JA
C     'ENTER THE BEGINNING AND ENDING ROWS YOU WANT PRINTED'
130   CALL READN2(2,2,XL,X,XU,KK,56,0,0,PRINTX)
      GOTO(140,100,100,60),KK
140   NRS=X(1)
      NRF=X(2)
      IF (NRF.LE.NR) GOTO 150
C     'THE COL OR ROW NUMBER IS > THAN THE NUMBER OF ROWS OR COLS'
```

```
      CALL MSG(28,0,0)
      CALL INFO
      GOTO 130
C     'ENTER THE BEGINNING AND ENDING COLUMNS YOU WANT PRINTED'
150   CALL READN2(2,2,XL,X,XU,KK,57,0,0,PRINTX)
      GOTO(160,150,150,60),KK
160   NCS=X(1)
      NCF=X(2)
      IF (NCT.LE.NC) GOTO 500
C     'THE COL OR ROW NUMBER IS > THAN THE NUMBER OF ROWS OR COLS'
      CALL MSG(28,0,0)
      CALL INFO
      GOTO 150
C
C     FORMAT THE OUTPUT
200   CALL ANSW(12,JCODE,J1,141,0,0,PRINTX)
      GOTO (210,220,230,240,250,290,310,320,330,340,350,100),J1
C
C     'FIND THE NUMBER OF COLUMNS PER PAGE (NO LIMIT)'
210   CALL READN2(1,1,XL,B,XU,KK,142,ICOL,0,PRINTX)
      GOTO(215,200,200,200),KK
215   ICOL=B(1)
      GOTO 200
C
C     'FIND THE NUMBER OF DECIMAL POINTS IN THE NUMBERS.'
220   X1=MIN(9,IWIDE-1)
      CALL READN2(1,1,0.,B,X1,KK,143,IDEC,0,PRINTX)
      GOTO(225,200,200,200),KK
225   IDEC=B(1)
      GOTO 200
C
C     'FIND THE NUMBER OF LINES PER PAGE.'
230   CALL READN2(1,1,6.,B,XU,KK,144,LPP,0,PRINTX)
      GOTO(235,200,200,200),KK
235   LPP=B(1)
      GOTO 200
C
C     'FIND THE NUMBER OF DIGITS PER COLUMN.'
240   X1=MIN(3,IDEC+1)
      CALL READN2(1,1,X1,B,XU,KK,145,IWIDE,0,PRINTX)
      GOTO(245,200,200,200),KK
245   IWIDE=B(1)
      GOTO 200
C
C     'FIND THE PRINTER CONTROL CODES.'
250   I=0
255   CALL READN2(1,1,0.,B,255.,KK,146,0,0,PRINTX)
      GOTO(260,200,200,270),KK
260   I=I+1
      SETUP(I)=CHAR(INT(B(1)))
      IF (I.EQ.30) GOTO 270
      GOTO 255
```

```
270   IF (I.EQ.0) GOTO 200
C     BLANK OUT THE REST OF THE SETUP STRING
      WRITE (8,280) (SETUP(J),J=1,I),CHAR(13)
C     WRITE (6,280) (SETUP(J),J=1,I),CHAR(13)
C     WRITE (6,*) (ICHAR(SETUP(J)),J=1,I)
280   FORMAT(1X,31A1)
      GOTO 200
C
C     'ENTER THE HEADERS (1,2 OR 3)
290   CALL READN2(1,1,1.0,X,3.0,KK,148,0,0,PRINTX)
      GOTO(295,200,200,200),KK
295   I=X(1)
      CALL READST(LINE80,147,0,PRINTX)
C     CALL MSG(147,I,0)
      GOTO 300
C     'ENTER THE FOOTER'
310   CALL READST(LINE80,149,I,0,PRINTX)
C310   CALL MSG(149,0,0)
C
C300   READ (5,301,END=200) LINE80
C301   FORMAT(A80)
300   IF (LINE80.EQ.'STOP') GOTO 200
C     TEST IF THE TEXT SHOULD BE CENTERED "¦" SYMBOL DENOTES CENTERING
      IF (LINE(1).EQ.'¦') THEN
C        LOCATE LAST CHARACTER
         LINE(1)=' '
         DO 302 K=80,1,-1
            IF (LINE(K).NE.' ') GOTO 303
302      CONTINUE
         GOTO 308
303      IMOVE=(IWIDE*MIN(ICOL,NC)+6-K)/2
         IF (IMOVE.LE.1) GOTO 308
         DO 304 J=K+IMOVE,2+IMOVE,-1
304      LINE(J)=LINE(J-IMOVE)
         DO 305 J=1,IMOVE+1
305      LINE(J)=' '
         ENDIF
C     PLACE THE CENTERED TEXT IN THE HEADER OR FOOTER.
308   IF (J1.EQ.6) THEN
         HEADER(I)=LINE80
         ELSE
         FOOTER=LINE80
         ENDIF
      GOTO 200
C
C     'PLACE ALL THE DEFAULT VALUES IN THE ARGUMENTS'
320   ICOL=5
      IWIDE=15
      IDEC=4
C     'SET THE DEFAULT HEADERS & FOOTERS
330   FOOTER=' '
      HEADER(1)='DEFAULT'
```

```
      HEADER(2)='DEFAULT'
      HEADER(3)='DEFAULT'
      GOTO 200
C
C     'PLACE THE OUTPUT IN A DOS FILE
340   I=0
      CALL GETTOK(FN,150,0,0,I,I)
      IF (FN.EQ.'STOP') GOTO 200
      INQUIRE (UNIT=1,OPENED=LOPEN)
      IF (LOPEN) CLOSE(1)
C     INQUIRE (FILE=FN,EXIST=LEXIST)
C     IF (LEXIST) THEN
C        FN32(32)=CHAR(0)
C        CALL ERASE(FN)
C        FN32(32)=' '
C        ENDIF
      INQUIRE (FILE=FN,EXIST=LEXIST)
      OPEN(1,STATUS='NEW')
      JUNIT=1
      GOTO 200
C
C     DISPLAY THE STATISTICS
350   WRITE (6,360) ICOL,IDEC,IWIDE,LPP,HEADER,FOOTER
360   FORMAT(/ ,' COLUMNS  =',I20,/,
     *          ' DECIMAL  =',I20,/,
     *          ' WIDTH    =',I20,/,
     *          ' LENGTH   =',I20,/,
     *          ' HEADER(1)=',A70,/,
     *          ' HEADER(2)=',A70,/,
     *          ' HEADER(3)=',A70,/,
     *          ' FOOTER   =',A70)
      GOTO 200
C
C     'CREATE THE OUTPUT FORMAT
500   WRITE  (FMT1,510) ICOL,IWIDE
510   FORMAT ('(/,5X,',I3,'I',I2,',/)')
      WRITE  (FMT2,520) ICOL,IWIDE,IDEC
520   FORMAT ('(I4,1X,',I3,'F',I2,'.',I1,')')
C
C     'TEST FOR THE DEFAULT HEADING (WHEN HEADER(1)='DEFAULT')
      IF (HEADER(1).EQ.'DEFAULT') THEN
         WRITE(HEADER(1),'(A32,1X,A30)') NAME,XTYPE(ITYPE)
         DEFLT=.TRUE.
         ENDIF
C     'CALL THE ROUTINE TO PRINT THE MATRIX'
      CALL PRTMAT(A,MAXR,MAXR,NRS,NRF,NCS,NCF,NRFM,JUNIT)
      IF (DEFLT) THEN
         DEFLT=.FALSE.
         HEADER(1)='DEFAULT'
         ENDIF
C
60    IF (JUNIT.EQ.1) CLOSE(1)
```

```
      RETURN
      END
C$DEBUG
C     ***********************************************************************
C     *       SUBROUTINE PRTMAT (A,                                         *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE PRTMAT(A,NR,NC,NRS,NRF,NCS,NCF,NRFM,IUNIT)
C *** PRTFMT FORTRAN
C     THIS SECTION IS USED TO SHARE THE "FORMATS" USED IN THE
C     PRINT, APPROX, AND PRTMAT SUBROUTINES.
C
C     IWIDE  : THE NUMBER OF DIGITS PER COLUMN          (DEFAULT 15)
C     ICOL   : THE NUMBER OF COLUMNS PER PAGE OF OUTPUT (DEFAULT 5)
C     IDEC   : THE NUMBER OF DECIMAL POINTS             (DEFAULT 5)
C     LPP    : THE NUMBER OF LINES PER PAGE OF OUTPUT   (DEFAULT 66)
C     HEADER : UPTO 3 HEADINGS CAN BE USED ON THE TOP OF EACH PAGE
C     FOOTER : ONLY 1 FOOTER CAN BE USED ON THE BOTTOM OF EACH PAGE
C     FMT1   : THE FORTRAN FORMAT TO DISPLAY THE COLUMN NUMBERS
C     FMT2   : THE FORTRAN FORMAT TO DISPLAY THE DATA
C
      CHARACTER*80 FMT1,FMT2,HEADER(3),FOOTER
      COMMON /PRTFMT/ IWIDE,ICOL,IDEC,LPP,HEADER,FOOTER,FMT1,FMT2
      REAL A(NR,NC)
C
C     DETERMINE THE TOP (HEADER) AND BOTTOM (FOOTER) MARGIN
C     SET TOP MARGIN TO BE 1"
      MARGIN=5
      IHEAD=1
      LINES=0
      IF (HEADER(2).NE.'DEFAULT') THEN
         IHEAD=2
         IF (HEADER(3).NE.'DEFAULT') THEN
            IHEAD=3
            ENDIF
         ENDIF
      IF (FOOTER.NE.' ')MARGIN=MARGIN+1
C     INCREASE MARGIN LENGTH FOR BOTTOLM MARGIN BY 1"
      MARGIN=MARGIN+6+IHEAD
      IF (MARGIN+2.GT.LPP) LPP=10000
C
C     MAJOR COLUMN LOOP (K)
      DO 50 K=NCS,NCF,ICOL
         K2=MIN(K+ICOL-1,NCF)
C
C        MAJOR ROW LOOP (II)
         DO 50 II=NRS,NRF,LPP-MARGIN
            I2=MIN(II+LPP-MARGIN-1,NRF)
C
C           DISPLAY THE HEADER (IF ANY EXISTS)
            DO 10 I=1,IHEAD
10          WRITE (IUNIT,20) HEADER(I)
```

```
20          FORMAT(1X,A79)
C
C           DISPLAY THE COLUMN HEADING NUMBERS
            WRITE (IUNIT,FMT1) (J,J=K,K2)
C           MINOR ROW DIVISION
C           DISPLAY THE DATA
            DO 40 I=II,I2
               IF (I.EQ.NRFM) WRITE (IUNIT,30)
30                FORMAT(' MULTIPLIERS:')
40             WRITE(IUNIT,FMT2) I,(A(I,J),J=K,K2)
C
C           DISPLAY THE FOOTER IF IT IS PRESENT
            WRITE (IUNIT,20) FOOTER
C           ADVANCE TO THE TOP OF THE PAGE IF THE NEXT GROUP OF
C           DATA WILL NOT FIT ON THE CURRENT PAGE.
            LINES=LINES+MARGIN
            IF (LINES+MARGIN.GT.LPP .AND. IUNIT.EQ.8) THEN
               LINES=0
               WRITE (IUNIT,'(1H1)')
               ENDIF
50     CONTINUE
C
60     IF (IUNIT.EQ.8) WRITE(IUNIT,'(1X)')
       RETURN
       END
C$DEBUG
       SUBROUTINE PUTINX
C *** TOKS FORTRAN
       INTEGER TLIST
       CHARACTER*8  PROMPT
       CHARACTER*32 TOKARR(50),TSLIST(10),FNAME
       LOGICAL MACON,MSGON,WORKON
       COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
      *           WORKON
       CHARACTER*1  INDFN1(12),INDNM1(10),INDX1(42)
       CHARACTER*10 INDNAM
       CHARACTER*12 INDFN,NAMTST
       CHARACTER*42 INDX
       CHARACTER*68 DESCR,DESC80*80
       LOGICAL      LEXIST
       EQUIVALENCE (INDNAM,INDNM1),(INDFN1,INDFN),(INDX,INDX1),
      *            (DESC80,DESCR)
       DATA INDNAM/'INDEX'/
C
       FNAME=TOKARR(1)
       TOKARR(1)='END '
       INDFN=FNAME
C      SEARCH FNAME FOR A PATH NAME LOOKING FOR ':' OR '\'
       DO 10 I=12,1,-1
C      WRITE (6,*) 'LOOKING FOR : OR \ WITH ',INDFN1(I),' AT ',I
       IF (INDFN1(I).EQ.':' .OR. INDFN1(I).EQ.'\') GOTO 20
10     CONTINUE
```

```
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      INDX=INDNAM
      INDFN=FNAME
      GOTO 55
C
C     SEPARATE THE FILE NAME FROM THE PATH
20    INDX=FNAME
      DO 30 J=1,12
30    INDFN1(J)=INDX1(J+I)
C
      DO 40 J=I+1,I+10
40    INDX1(J)=INDNM1(J-I)
C
      DO 50 J=I+11,42
50    INDX1(J)=' '
C
C     CHECK IF THE SAM.INX FILE EXISTS
55    INQUIRE(FILE=INDX,EXIST=LEXIST)
C     WRITE (6,*) 'FILE ',INDX,' EXIST=',LEXIST
C     *** NEXT STATEMENT FOR IBM ONLY ***
C     LEXIST=.TRUE.
      I=0
      IF (LEXIST) THEN
C        LOOK FOR THE THE MATCH OF THE FILE NAME IN SAM.INX
         OPEN(1,FILE=INDX,FORM='FORMATTED',ACCESS='DIRECT',RECL=80)
         IBLANK=1000
         DO 70 I=1,999
            READ(1,60,REC=I,ERR=80) NAMTST,DESCR
60          FORMAT(A12,A68)
            IF(NAMTST.EQ.INDFN) THEN
              WRITE (6,*) DESCR
              GOTO 80
              ENDIF
            IF (NAMTST.EQ.' '.AND.IBLANK.EQ.1000) IBLANK=I
70       CONTINUE
         ELSE
         OPEN(1,FILE=INDX,FORM='FORMATTED',ACCESS='DIRECT',RECL=80,
     *        STATUS='NEW')
         I=1
         ENDIF
C
C     GET THE DESCRIPTION
80    CALL READST(DESC80,31,0,0,'SAVE ')
C80    WRITE (6,*) 'ENTER THE DESCRIPTION'
C      READ  (*,90) DESCR
C90    FORMAT(A68)
      I=MIN(IBLANK,I)
      IF (I.EQ.0) I=1
      WRITE(1,60,REC=I,ERR=160) INDFN,DESCR
      RETURN
160   WRITE(6,*) 'ERROR IN WRITING THE FILE'
      CALL MACEXT
      RETURN
```

```
      END
C     ****************************************************************
C     *       SUBROUTINE PUTMAT                                      *
C     ****************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE PUTMAT(A,NR,NC,ITYPE,ISAVE)
C *** PRTFMT FORTRAN
C     THIS SECTION IS USED TO SHARE THE "FORMATS" USED IN THE
C     PRINT, APPROX, AND PRTMAT SUBROUTINES.
C
C     IWIDE  : THE NUMBER OF DIGITS PER COLUMN          (DEFAULT 15)
C     ICOL   : THE NUMBER OF COLUMNS PER PAGE OF OUTPUT (DEFAULT 5)
C VB35ESJRYM : THE NUMBER OF DECIMAL POINTS             (DEFAULT 5)
C     LPP    : THE NUMBER OF LINES PER PAGE OF OUTPUT   (DEFAULT 66)
C     HEADER : UPTO 3 HEADINGS CAN BE USED ON THE TOP OF EACH PAGE
C     FOOTER : ONLY 1 FOOTER CAN BE USED ON THE BOTTOM OF EACH PAGE
C     FMT1   : THE FORTRAN FORMAT TO DISPLAY THE COLUMN NUMBERS
C     FMT2   : THE FORTRAN FORMAT TO DISPLAY THE DATA
C
      CHARACTER*80 FMT1,FMT2,HEADER(3),FOOTER
      COMMON /PRTFMT/ IWIDE,ICOL,IDEC,LPP,HEADER,FOOTER,FMT1,FMT2
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      REAL*4 A(00550,00550)
      CHARACTER*32 FN,FMT3
      CHARACTER*16 PUTX
      CHARACTER*1  FN1(33)
      EQUIVALENCE  (FN,FN1)
      INTEGER ERR,IT
      LOGICAL LEXIST
      DATA PUTX/'PUT '/
      JMAX=3
100   CALL READFN(FN,IT,75,0,0,PUTX)
      IF (FN.EQ.'STOP') GOTO 60
      IF (IT.NE.0) ITYPE=IT
C     INQUIRE (FILE=FN,EXIST=LEXIST)
C     IF (LEXIST) THEN
C         WRITE (*,110) FN
C110       FORMAT (1X,A14,' ALREADY EXISTS')
C        CALL RESPND(KK,JMAX,109,0,0,PUTX)
C        GOTO(120,100,60,60),KK
C120      FN1(33)=CHAR(00)
C        CALL ERASE(FN)
C        ENDIF
C     ****************************************************************
C     * DETERMINE THE TYPE OF FILE TO GET '.DAT' OR '.DIF' OR '.PRN'  *
C     ****************************************************************
```

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C     LOCATE THE '.' IN THE FILE NAME
      DO 150 I=2,13
         IF (FN1(I).NE.'.') GOTO 150
         IF (FN1(I+1).EQ.'D' .AND. FN1(I+2).EQ.'I'
     *       .AND. FN1(I+3).EQ.'F') GOTO 200
         IF (FN1(I+1).EQ.'P' .AND. FN1(I+2).EQ.'R'
     *       .AND. FN1(I+3).EQ.'N') GOTO 300
         GOTO 160
150   CONTINUE
C     ***************************************************************
C     *  WRITING A .DAT FILE   (STANDARD SAM OUTPUT FILE )         *
C     ***************************************************************
160   WRITE(1,ERR=900) NR,NC,ITYPE
      WRITE(1,ERR=900) ((A(I,J),I=1,NR),J=1,NC)
      GOTO 800
C     ***************************************************************
C     *  WRITING A .DIF FILE                                        *
C     ***************************************************************
200   IF (LEXIST) THEN
         OPEN (1,FILE=FN,STATUS='OLD',FORM='FORMATTED')
         ELSE
         OPEN (1,FILE=FN,STATUS='NEW',FORM='FORMATTED')
         ENDIF
      WRITE (1,210,ERR=900) NC,NR
210   FORMAT('TABLE',/,
     *       '0,1',/,
     *       '""',/,
     *       'VECTORS',/,
     *       '0,',I2,/,
     *       '""',/,
     *       'TUPLES',/,
     *       '0,',I2,/,
     *       '""',/,
     *       'DATA',/,
     *       '0,0',/,
     *       '""')
      DO 230 I=1,NR
      WRITE (1,220,ERR=900)
220   FORMAT('-1,0',/,
     *       'BOT')
      DO 230 K=1,NC
230   WRITE(1,240,ERR=900) A(I,K)
240   FORMAT ('0,',F15.5,/,'V')
      WRITE (1,250,ERR=900)
250   FORMAT('-1,0',/,
     *       'EOD')
      GOTO 800
C     ***************************************************************
C     *  WRITING A .PRN FILE                                        *
C     ***************************************************************
300   OPEN (1,FORM='FORMATTED')
      WRITE(FMT3,310) IWIDE,IDEC
```

```
310   FORMAT('(170F',I2,'.',I1,')')
      DO 320 I=1,NR
320   WRITE (1,FMT3,ERR=900) (A(I,J),J=1,NC)
C320   FORMAT (100F15.5)
C     ************************************************************************
C     *  CLOSING THE OUTPUT FILE                                             *
C     ************************************************************************
800   ISAVE=0
      CLOSE (1,STATUS='KEEP')
      WRITE (6,810) FN
810   FORMAT(/,' DATA MATRIX ',A12,' HAS BEEN SAVED ON DISK.',/)
      GOTO 70
900   WRITE (6,910)
910   FORMAT (' DISK IS FULL.')
      CLOSE (1,STATUS='DELETE')
70    CONTINUE
C70    CALL RESPND(I,3,41,0,0,PUTX)
C     IF (I.NE.1) GOTO 60
C     TOKARR(1)=FN
C     CALL PUTINX
60    RETURN
      END
C     ************************************************************************
C     *       SUBROUTINE READD (NUM                                          *
C     ************************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE READD(NUMVAL,NUMTOT,XLOWER,XVALUE,XUPPER,KKCODE,
     *                 IN,I1,I2,HLPMSG)
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      INTEGER NUMVAL,NUMTOT,KKCODE,ERR,IFLAG,I,I1,I2,IC,ICN,IN,IR,IT
      DIMENSION  XVALUE(NUMTOT)
      REAL NUMTOK
      CHARACTER*32 GET,FN,NRKEY,NCKEY,ICODE(3)
      CHARACTER*32 TOKVAL
      CHARACTER*16 HLPMSG,GETNUM
      CHARACTER*1 TOK2(16)
      LOGICAL LEXIST
      EQUIVALENCE (TOK2,TOKVAL)
      DATA NRKEY,NCKEY,GET/'NR      ','NC      ','GET'/
      DATA ICODE/'COLUMN ','ROW ','STOP '/
      DATA GETNUM/'GETNUMBER '/
      NCNT=1
      IFLAG=0
C
C     KKCODE=1 ; EVERYTHING IS ALRIGHT
```

```
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C     KKCODE=4 ; STOP COMMAND WAS ENTERED
C
100   CALL GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)
C
      IF (TOKVAL.EQ.'END') GO TO 280
      IFLAG=1
C     READ (TOKVAL,130,ERR=170) NUMTOK
      DO 110 I=1,16
      IF (TOK2(I).GE.'A' .AND. TOK2(I).LE.'Z') GOTO 170
          IF  (TOK2(I).EQ.' ') THEN
              TOK2(I)='.'
              GO TO 120
          ELSE
              IF (TOK2(I).EQ.'.') GO TO 120
          ENDIF
110   CONTINUE
120   READ (TOKVAL,130,ERR=170) NUMTOK
130   FORMAT (BN,F16.8)
      IF((NUMTOK.GE.XLOWER).AND.(NUMTOK.LE.XUPPER)) GOTO 150
      WRITE (6,140) NUMTOK,XLOWER,XUPPER
140   FORMAT(1X,F16.8,' IS NOT WITHIN THE REQUIRED LIMITS OF ',
     *       F16.8,' TO ',F16.8/' PLEASE REENTER A CORRECTED VALUE.')
      ERR=1
      GOTO 100
150   XVALUE(NCNT)=NUMTOK
      NCNT=NCNT+1
160   KKCODE=1
      IF (NCNT.LE.NUMTOT) GOTO 100
      RETURN
170   IF   (TOKVAL.NE.'STOP'.AND.TOKVAL.NE.'STO'.AND.TOKVAL.NE.'ST'
     * .AND.TOKVAL.NE.'ST'  .AND.TOKVAL.NE.'S') GOTO 190
C     STOP COMMAND WAS ENTERED
180   KKCODE=4
      RETURN
190   IF (TOKVAL.NE.NRKEY) GOTO 200
      NUMTOK=FLOAT(NR)
      GOTO 150
200   IF (TOKVAL.NE.NCKEY) GOTO 210
      NUMTOK=FLOAT(NC)
      GOTO 150
210   IF (TOKVAL.NE.'HELP') GOTO 230
C     HELP COMMAND WAS ENTERED
      CALL HELP(HLPMSG)
      GOTO 100
C     ***************************************************************
C     *       GET THE NUMBERS FROM A DATA FILE                      *
C     ***************************************************************
230   IF (TOKVAL.NE.GET) GOTO 320
      IFLAG=0
      CALL GETTOK (FN,74,0,0,IERR,IFLAG)
      IF   (FN.EQ.'STOP' .OR. FN.EQ.'STO'
     * .OR. FN.EQ.'ST'   .OR. FN.EQ.'S' ) GOTO 180
```

```
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      CALL ANSW(3,ICODE,K2,72,0,0,HLPMSG)
      IF (K2.EQ.3) GOTO 180
      IF (FN.EQ.'INTERNAL') THEN
         IR=NR
         IC=NC
         GOTO 235
         ENDIF
      INQUIRE(FILE=FN,EXIST=LEXIST)
C     *** FOR IBM ONLY ***
C     LEXIST=.TRUE.
      IF (.NOT.LEXIST ) THEN
         WRITE(*,970) FN
         ERR=1
         GOTO 100
         ELSE
         OPEN (1,FORM='UNFORMATTED')
         READ(1,END=900) IR,IC,IT
         ENDIF
235   IFLAG=1
      IF (K2.EQ.2) GOTO 260
C     READ A COLUMN FROM A MATRIX
240   CALL READN2(1,1,1.,X,FLOAT(IC),KK,92,0,0,HLPMSG)
      GOTO (250,240,240,180),KK
250   ICN = IFIX(X(1))
      L=MIN(IR,NUMTOT-NCNT+1)+NCNT-1
      IF (FN .EQ. 'INTERNAL') THEN
         DO 255 I=NCNT,L
255      XVALUE(I)=A(I-NCNT+1,ICN)
         ELSE
         IF (ICN.EQ.1) THEN
            READ(1) (XVALUE(I),I=NCNT,L)
            ELSE
            J=IR*(ICN-1)
            READ(1)  (ICN,I=1,J),(XVALUE(I),I=NCNT,L)
            ENDIF
         CLOSE (1)
         ENDIF
      NCNT=L+1
      GOTO 160
C     READ IN A ROW FROM A MATRIX
260   CALL READN2(1,1,1.,X,FLOAT(IR),KK,86,0,0,HLPMSG)
      GOTO (270,260,260,180),KK
270   IRN = IFIX(X(1))
      L=MIN(IC,NUMTOT-NCNT+1)+NCNT-1
      IF (FN .EQ. 'INTERNAL') THEN
         DO 275 I=1,NCNT,L
275      XVALUE(I)=A(IRN,I-NCNT+1)
         ELSE
         IF (IRN.EQ.1) THEN
            ITAIL=IR-1
            READ(1) (XVALUE(I),(J,M=1,ITAIL),I=NCNT,L)
            ELSE
```

```
            IHEAD=IRN-1
            ITAIL=IR-IRN
            READ(1) ((J,K=1,IHEAD),XVALUE(I),(J,K=1,ITAIL),I=NCNT,L)
            ENDIF
         CLOSE (1)
         ENDIF
       NCNT=L+1
       GOTO 160
C
280    IF (IFLAG.EQ.0.AND.NCNT.EQ.1) GOTO 100
       I=NUMTOT-NCNT+1
       IFLAG=1
       IF (I.EQ.1) GOTO 300
       WRITE (6,290) I
290    FORMAT (1X,I3,' MORE NUMBERS ARE NEEDED.')
       GOTO 100
300    WRITE(*,310)
310    FORMAT(1X,'ONE MORE NUMBER IS NEEDED.')
       GOTO 100
320    WRITE (6,330) TOKVAL
330    FORMAT(/,' INVALID NUMBER ''',A16,'''. PLEASE REENTER A CORRECTED
      *VALUE.',/)
       ERR=1
       GOTO 100
C
900    WRITE(*,905) FN
905    FORMAT(/,' DATA FILE ',A16,' CANNOT BE LOCATED.',/)
       GOTO 190
910    WRITE(*,915) FN,IR
915    FORMAT(/,' DATA FILE ',A16,' ONLY HAS ',I3,' ROWS.',/)
       GOTO 190
970    FORMAT(/,' DATA FILE ',A14,' CAN NOT BE LOCATED.',/)
       END
C      ***********************************************************************
C      *       SUBROUTINE READFN (FN                                         *
C      ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
       SUBROUTINE READFN(FN,FT,IN,I1,I2,HLPMSG)
       INTEGER FT,KKCODE,IFLAG
       CHARACTER*32 TOKVAL
       CHARACTER*32 TYPES(4),FILEN
       CHARACTER*32 FN
       CHARACTER*32 HLPMSG
       EQUIVALENCE (TOK2,TOK),(FNAME,FILEN)
       DATA TYPES/'TRANSACTION','DIRECT  ','TOTAL   ','DATA    '/
       KKCODE=0
       FT=0
       IFLAG=0
100    CALL GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)
       IF (TOKVAL.EQ.'HELP ') THEN
          CALL HELP(HLPMSG)
          GOTO 100
```

```
         ENDIF
        FN = TOKVAL
        RETURN
        END
C       ***********************************************************************
C       *       SUBROUTINE READN2 (NU                                         *
C       ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
        SUBROUTINE READN2(NUMVAL,NUMTOT,XLOWER,XVALUE,XUPPER,KKCODE,
       *                  IN,I1,I2,HLPMSG)
C *** VARS FORTRAN
         REAL*4 R(00550,00550),A(00550,00550),B(00550)
         REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
         INTEGER MAXR,NR,NC,ITYPE,ISAVE
         CHARACTER*32 NAME
         COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
       *              XU,ERR
         COMMON /TWO/ NAME
        INTEGER ERR,NUMVAL,NUMTOT,KKCODE,IFLAG,IN,I1,I2
        REAL NUMTOK
        DIMENSION     XVALUE(NUMTOT)
        CHARACTER*8  STOP,NRKEY,NCKEY
        CHARACTER*32 TOKVAL
        CHARACTER*16 HLPMSG
        CHARACTER*1  TOK2(16)
        EQUIVALENCE (TOK2,TOKVAL)
        DATA STOP,NRKEY,NCKEY /'STOP    ','NR   ','NC   '/
        IFLAG=0
        NCNT=1
C
C       KKODE=1 ; EVERYTHING IS ALRIGHT
C       KKODE=4 ; STOP COMMAND WAS REQUESTED
C
100     CALL GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)
220     IF (TOKVAL.NE.STOP) GOTO 221
        KKCODE=4
        RETURN
221     IF (TOKVAL.NE.NRKEY) GOTO 222
        NUMTOK=FLOAT(NR)
        GOTO 211
222     IF (TOKVAL.NE.NCKEY) GOTO 223
        NUMTOK=FLOAT(NC)
        GOTO 211
223     IF (TOKVAL.NE.'HELP') GOTO 200
        CALL HELP(HLPMSG)
        GOTO 100
200     READ (TOKVAL,12,ERR=220) NUMTOK
        DO 111 I=1,16
            IF (TOK2(I).EQ.' ') THEN
                TOK2(I)='.'
                GO TO 109
            ELSE
```

```
            IF (TOK2(I).EQ.'.') GO TO 109
          ENDIF
111     CONTINUE
109     READ (TOKVAL,12,ERR=220) NUMTOK
12      FORMAT (BN,F16.8)
210     IF((NUMTOK.GE.XLOWER).AND.(NUMTOK.LE.XUPPER)) GOTO 211
        WRITE(*,212) NUMTOK,XLOWER,XUPPER
212     FORMAT(1X,F16.8,' IS NOT WITHIN THE REQUIRED LIMITS OF ',
     +       F16.4,' TO ',F16.4/' PLEASE REENTER A CORRECTED VALUE.')
        ERR = 1
        GOTO 100
211     XVALUE(NCNT)=NUMTOK
        NCNT=NCNT+1
        KKCODE=1
        IF (NCNT.LE.NUMTOT) GOTO 100
        RETURN
C200     WRITE(*,201) TOKVAL
C201     FORMAT(/,' INVALID NUMBER ''',A16,'''. PLEASE REENTER A CORRECTED
C       *VALUE.',/)
C        ERR = 1
C        GOTO 100
250     IF (IFLAG.EQ.0.AND.NCNT.EQ.1) GOTO 100
        I=NUMTOT-NCNT+1
        IF (I.EQ.1) GOTO 252
        WRITE (6,251) I
251     FORMAT (1X,I3,' MORE NUMBERS ARE NEEDED.')
        GOTO 100
252     WRITE(*,253)
253     FORMAT(1X,'ONE MORE NUMBER IS NEEDED.')
        GOTO 100
        END
C$DEBUG
        SUBROUTINE READST(LINE,IN,I1,I2,HLPMSG)
C *** VARS FORTRAN
         REAL*4 R(00550,00550),A(00550,00550),B(00550)
         REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
         INTEGER MAXR,NR,NC,ITYPE,ISAVE
         CHARACTER*32 NAME
         COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
       *              XU,ERR
         COMMON /TWO/ NAME
C *** TOKS FORTRAN
        INTEGER TLIST
        CHARACTER*8  PROMPT
        CHARACTER*32 TOKARR(50),TSLIST(10)
        LOGICAL MACON,MSGON,WORKON
        COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
       *           WORKON
        CHARACTER*127 LINE,LINEX,LINEY,LINEZ*32
        CHARACTER*1  LINEA(127),LINEB(127),LINEC(32),DIGIT
        CHARACTER*16 FMT2
        LOGICAL      LOPEN
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      INTEGER      IRC(4)
      EQUIVALENCE  (LINEX,LINEA),(LINEY,LINEB),(LINEZ,LINEC)
C
5     IF (MSGON) CALL MSG(IN,I1,I2)
      IF (MACON) THEN
         READ (7,10,END=200,ERR=200) LINEX
         ELSE
         READ (5,10,END=210,ERR=210) LINEX
         ENDIF
10    FORMAT(A80)
      IF (LINEX.EQ.'HELP ') THEN
         CALL HELP(HLPMSG)
         GOTO 5
         ENDIF
C
      J=0
      I=0
20    J=J+1
30    I=I+1
C     WRITE (6,*) 'TOP OF PROG LOOK AT I,J',I,J,LINEA(I)
      IF (I.GT.80  .OR. J.GT.80 ) GOTO 60
      IF (LINEA(I).NE.'%') THEN
C        NO SPECIAL TOKEN ASSIGNMENT GIVEN. JUST MOVE A CHARACTER
         LINEB(J)=LINEA(I)
         GOTO 20
         ELSE
C
C        PROCESS A % TOKEN ASSIGNMENT
C        TEST FOR A %MROW,COL,LEN,DEC TOKEN
         IF (LINEA(I+1).EQ.'M') THEN
            DO 100 I1=1,4
100         IRC(I1)=0
            K=1
            IRC(1)=0
            DO 110 I1=I+2,80
C              WRITE (6,*) 'EXAMINE ',LINEA(I1),' AT ',I1,' K=',K
               IF (LINEA(I1).EQ.',') THEN
                  K=K+1
                  IF (K.EQ.5) GOTO 120
                  IRC(K)=0
                  GOTO 110
                  ENDIF
               DIGIT=LINEA(I1)
               IF (DIGIT.EQ.' ') GOTO 120
               IF (DIGIT.LT.'0' .OR. DIGIT.GT.'9') THEN
                  LINEB(J)='?'
                  I=I1
                  GOTO 20
                  ENDIF
               READ (DIGIT,'(I1)') L
               IRC(K)=IRC(K)*10+L
C              WRITE (6,*) 'K,IRC',K,IRC(K)
```

```
110         CONTINUE
C           CHECK TO SEE IF ALL THE VALUES ARE VALID
C120         WRITE (6,*) 'AT 120 I1=',I1
120         I=I1-1
            IF (IRC(1).EQ.0 .OR. IRC(2).EQ.0 .OR. IRC(3).EQ.0) THEN
                LINEB(J)='?'
                GOTO 20
                ENDIF
            WRITE (FMT2,130) IRC(3),IRC(4)
130         FORMAT('(F',I2,'.',I2,',1X)')
            WRITE (LINEZ,FMT2) A(IRC(1),IRC(2))
C           MOVE THE FORMATTED VALUE INTO LINEB
            DO 140 I2=1,IRC(3)+1
C           WRITE (6,*) 'J,I2,LINEC=',J+I2-1,I2,LINEC(I2)
140         LINEB(J+I2-1)=LINEC(I2)
C           WRITE (6,*) 'AT END I,I1',I,I1
            J=J+IRC(3)-1
            GOTO 20
            ENDIF
C
C        CHECK IF THERE IS A NUMBERIC TOKEN ASSIGNMENT
         DIGIT=LINEA(I+1)
         IF (DIGIT.LT.'0' .OR. DIGIT.GT.'9') THEN
C           NO - JUST MOVE CHARACTER.
            LINEB(J)=LINEA(I)
            GOTO 20
            ELSE
C           SUBSTITUTION OF A %N VARIABLE
            READ(DIGIT,'(I1)') L
            LINEZ=TSLIST(L+1)
            I=I+1
            DO 40 K=1,32
               IF (LINEC(K).EQ.' ') GOTO 30
               LINEB(J)=LINEC(K)
               J=J+1
               IF (J.GT.80) GOTO 60
40          CONTINUE
            ENDIF
         ENDIF
60    LINE=LINEY
      GOTO 210
C
200   CALL MACEXT
210   RETURN
      END
C     IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C     :        SUBROUTINE REGION                                        :
C     HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
      SUBROUTINE REGION
C$INCLUDE:'OPTIONS.FOR'
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
```

```
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       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** VAR2 FORTRAN
      REAL Q(00550,00550)
      COMMON /SIX/ Q
      CHARACTER*32 ICODE(3),JCODE(6)
      CHARACTER*32 FN
      CHARACTER*16 REGX,FINX
      REAL MAD
      DATA REGX/'REGION      '/,FINX/'FINAL '/
      DATA ICODE  /'TRANSACTIONS','DIRECT  ','STOP    '/
      DATA JCODE /'CIQ','PLQ','SLQ','SDP','RAS','STOP'/
C     IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C     :   DETERMINE THE TYPE OF REGIONALIZATION                       :
C     HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
      CALL ANSW(6,JCODE,JC1,121,0,0,REGX)
      GOTO (100,100,100,100,100,60),JC1
C     IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C     :   READ IN THE NATIONAL AIJ TABLE                              :
C     HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
100   CALL GETMAT(A,NR,NC,IT,ISAVE,122,JCODE(JC1))
      IF (ISAVE.EQ.1) GOTO 60
      GOTO (105,105,105,250,300,60),JC1
C     COPY TO "R" MATRIX FOR "FINAL DEMAND" ADJUSTMENT. (IF NEEDED)
105   DO 102 I=1,NR
         DO 102 J=1,NC
102      R(I,J)=A(I,J)
C
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   FIND THE MAXIMUM VALUE THE LQ'S CAN HAVE                    3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
      CALL READD(1,1,0.0,XMAX,1.0,KK,123,0,0,JCODE(JC1))
C     IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C     :   SLQ, CIQ AND PLQ                                            :
C     HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   READ IN THE REFERENCE ACTIVITY DATA BY SECTOR               3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
110   CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,124,NR,0,JCODE(JC1))
      GOTO (120,110,110,60),KK
120   JR=NR+1
      DO 130 I=1,NR
130   Q(I,1)=B(I)
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   READ IN THE REGIONAL ACTIVITY DATA BY SECTOR                3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
140   CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,125,NR,0,JCODE(JC1))
      GOTO (150,140,140,60),KK
```

```
150   DO 160  I=1,NR
160   Q(I,2)=B(I)
C
      GOTO (210,171,170),JC1
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3  GET TOTALS FOR SLQ                                            3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
170   CALL READD(1,1,-1.0E9,B,1.0E9,KK,126,0,0,JCODE(JC1))
      IF (KK.EQ.4) GOTO 60
      Q(JR,2)=B(1)
      CALL READD(1,1,-1.0E9,B,1.0E9,KK,127,0,0,JCODE(JC1))
      IF (KK.EQ.4) GOTO 60
      Q(JR,1)=B(1)
      GOTO 190
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3  CALCULATE THE TOTALS FOR PLQ                                  3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
C     Q(*,1) : REFERENCE ECONOMY SECTOR OUTPUT ACTIVITY
C     Q(*,2) : REGIONAL  ECONOMY SECTOR OUTPUT ACTIVITY
C     Q(*,3) : REFERENCE ECONOMY PURCHASE-ONLY ACTIVITY (TOTALS)
C     Q(*,4) : REGIONAL  ECONOMY PURCHASE-ONLY ACTIVITY (TOTALS)
C
171   DO 175 I=1,NR
         Q(I,3)=0.0
         Q(I,4)=0.0
         DO 175 J=1,NC
            IF (A(I,J).EQ.0.0) GOTO 175
            Q(I,3)=Q(I,3)+Q(J,1)
            Q(I,4)=Q(I,4)+Q(J,2)
175   CONTINUE
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3    CALCULATE THE LOCATION QUOTIENTS AND AIJ FOR PLQ            3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
180   DO 182 I=1,NR
      IF (Q(I,3).EQ.0.0 .OR. Q(I,4).EQ.0.0) THEN
         QUOT=0.0
         GOTO 182
         ENDIF
      QUOT=MIN(XMAX,Q(I,2)*Q(I,3)/(Q(I,1)*Q(I,4)))
      DO 181 J=1,NC
181   A(I,J)=QUOT*A(I,J)
182   CONTINUE
      GOTO 220
C
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   CALCULATE THE LOCATION QUOTIENTS AND AIJ FOR SLQ             3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
C     Q(*,1)  : THE REFERENCE ECONOMY ACTIVITY COLUMN
C     Q(*,2)  : THE REGIONAL ECONOMY ACTIVITY COLUMN
C     Q(JR,*) : THE TOTAL ECONOMIC ACTIVITY
190   DO 200 I=1,NR
C     WRITE (6,*) I,Q(I,1),Q(I,2),JR,Q(JR,1),Q(JR,2)
```

```
      IF (Q(I,2).EQ.0.0 .OR. Q(I,1).EQ.0.00) THEN
         QUOT=0.0
         ELSE
         QUOT= MIN(XMAX,(Q(I,2)/Q(JR,2)) / (Q(I,1)/Q(JR,1)))
         ENDIF
      DO 209 J=1,NC
C     WRITE (6,*) 'I,J,QUOT,R',I,J,QUOT,A(I,J)
209   A(I,J)=A(I,J)*QUOT
200   CONTINUE
      GOTO 220
C
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   CALCULATE THE LOCATION QUOTIENTS AND AIJ FOR CIQ              3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
C     Q(*,1) IS THE REFERENCE ECONOMY ACTIVITY COLUMN
C     Q(*,2) IS THE REGIONAL ECONOMY ACTIVITY COLUMN
C     NATIONAL ECONOMY MUST NOT HAVE A 0.0 VALUE. SET TO A LARGE NUMBER
210   DO 212 I=1,NR
      IF (Q(I,1).EQ.0.0) Q(I,2)=1.0E9
212   CONTINUE
      DO 214 I=1,NR
      QUOT=Q(I,2)/Q(I,1)
      DO 214 J=1,NR
C     WRITE (6,*) I,J,Q(I,1),Q(I,2),Q(J,1),Q(J,2),QUOT
214   A(I,J)=A(I,J)*MIN(XMAX,Q(J,1)/Q(J,2)*QUOT)
      GOTO 220
C
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   TRANSPORTATION ADJUSTMENT USING FINAL DEMANDS & OUTPUTS       3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
220   CALL RESPND(J1,3,151,0,0,FINX)
      GOTO (221,350,350,60),J1
C     FIND THE BEGINNING AND ENDING SECTORS (ROWS)
221   CALL READN2(2,2,XL,X,FLOAT(NC),KK,70,0,0,FINX)
      GOTO (222,221,221,60),KK
222   MSS=X(1)
      MSF=X(2)
      NMS=MSF-MSS+1
C     READ IN OUTPUT VALUES
223   CALL READD(NMS,NMS,RL,B,RU,KK,131,NMS,0,FINX)
      GOTO (224,223,223,60),KK
C     MOVE TOTALS INTO THE LAST COLUMN
224   DO 225 I=MSS,MSF
225   A(I,NC+1)=B(I-MSS+1)
C
C     READ IN THE FINAL DEMANDS
226   CALL READD(NMS,NMS,RL,B,RU,KK,132,NMS,0,FINX)
      GOTO (227,226,226,60),KK
C     MOVE EXPORTS INTO FINAL DEMAND COLUMN
227   DO 228 I=MSS,MSF
      IF (A(I,NC+1).NE.0.0) A(I,NC+1)=1.0-B(I-MSS+1)/A(I,NC+1)
228   CONTINUE
```

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C     CALCULATE THE PROPORTIONS
      DO 239 I=MSS,MSF
C        DETERMINAL THE SUM OF THE NATIONAL AIJ BY ROW.
         Z=0.0D0
         DO 229 J=1,NC
            Z=Z+R(I,J)
229      CONTINUE
         IF (Z.GT.0.0) THEN
            Z=A(I,NC+1)/Z
            ELSE
            Z=0.0
            ENDIF
         DO 230 J=1,NC
230      A(I,J)=R(I,J)*Z
239   CONTINUE
      GOTO 350
C
C     IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C     :       SUPPLY - DEMAND POOL  SDP                            :
C     HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
C     THERE MUST BE AT LEAST ONE FINAL DEMAND SECTOR.
250   XR=NC-1
C     GET THE NUMBER OF ENDOGENOUS SECTORS.
      CALL READD(1,1,1.0,B(1),XR,KK,130,0,0,JCODE(JC1))
      GOTO (255,250,60),KK
255   IENDOG=B(1)
C
C     GET THE ACTUAL ENDOGENOUS SECTOR TOTALS
260   CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,131,NR,0,JCODE(JC1))
      GOTO (265,260,260,60),KK
265   DO 267  I=1,NR
267   Q(I,1)=B(I)

C     GET THE ACTUAL FINAL DEMAND SECTOR TOTALS (FROM PRIMARY PAYMENTS)
      I=NC-IENDOG
270   CALL READD(I,I,-1.0E9,B,1.0E9,KK,132,I,0,JCODE(JC1))
      GOTO (275,270,270,60),KK
275   DO 277  I=IENDOG+1,NC
C     WRITE (6,*) 'I,VALUE=',I,B(I-IENDOG)
277   Q(I,1)=B(I-IENDOG)
C
C     ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C     3   CALCULATE THE LOCATION QUOTIENTS AND AIJ FOR SDP           3
C     @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
      DO 290 I=1,NR
         XR=0.0
         DO 280 J=1,NC
C        WRITE (6,*) 'I,J,A(I,J),Q(J,1)=',I,J,A(I,J),Q(J,1)
280      XR=XR+A(I,J)*Q(J,1)
C        WRITE (6,*) 'I,Q(I,1),XR=',I,Q(I,1),XR
         IF (XR.GT.Q(I,1)) THEN
            XR=Q(I,1)/XR
```

```
C           WRITE (6,*) 'LQ=',XR
            DO 285 J=1,NC
285         A(I,J)=A(I,J)*XR
            ENDIF
290     CONTINUE
        GOTO 350
C       IMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM;
C       :     RAS                                                       :
C       HMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM<
C       GET THE SALES VALUES
300     CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,133,NR,0,JCODE(JC1))
        GOTO (302,300,300,60),KK
302     XR=0.0
        DO 305  I=1,NR
        XR=XR+B(I)
305     Q(I,1)=B(I)
C
C       GET THE PURCHASE VALUES
307     CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,134,NR,0,JCODE(JC1))
        GOTO (308,307,307,60),KK
308     DO 309  I=1,NR
        XR=XR-B(I)
309     Q(I,2)=B(I)
C
C       TEST TO SEE IF THE SUM OF THE SALES EQUALS PURCHASES
        IF (ABS(XR).GT. .1) THEN
           CALL MSG(135,0,0)
           GOTO 60
           ENDIF
C
C       GET THE GROSS OUTPUT VALUES
310     CALL READD(NR,NR,-1.0E9,B,1.0E9,KK,136,NR,0,JCODE(JC1))
        GOTO (312,310,310,60),KK
312     DO 315  I=1,NR
315     Q(I,3)=B(I)
C
C       ZDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD?
C       3    START THE ITERATIVE PROCESS FOR RAS                          3
C       @DDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDY
        K1=10
318     DO 340 K=1,10
C          GENERATE THE 'R'
           DO 320 I=1,NR
              XR=0.0
              DO 325 J=1,NC
325           XR=XR+A(I,J)*Q(J,3)
320        B(I)=Q(I,1)/XR
C
C          CREATE A NEW AIJ MATRIX
           DO 330 I=1,NR
              DO 330 J=1,NR
330           A(I,J)=A(I,J)*B(I)
```

```
C
C        GENERATE THE 'S'
         DO 332 J=1,NC
            XR=0.0
            DO 334 I=1,NR
334         XR=XR+A(I,J)
C           WRITE (6,*) 'I,J,VHAT=',I,J,XR*Q(J,3)
332      B(J)=Q(J,2)/(XR*Q(J,3))
C        WRITE (6,*) 'S=',(B(J),J=1,NC)
C        CREATE A NEW AIJ MATRIX
         XMAX=0.0
         XMAD=0.0
         DO 335 J=1,NC
            DO 335 I=1,NR
            XR=A(I,J)*B(J)
            XERR=ABS(A(I,J)-XR)
            XMAD=XMAD+XERR
            IF (XERR.GT.XMAX) XMAX=XERR
335         A(I,J)=XR
340   CONTINUE
      XMAD=XMAD/NR/NC
      WRITE (6,345) K1,XMAD,XMAX
345   FORMAT(' CONVERGENCE TEST AFTER ',I2,' ITERATIONS.',/,
     *       ' MEAN ABSOLUTE DEVIATION =',F12.4,/,
     *       ' MAXIMUM CELL ERROR      =',F12.4)
      K1=K1+10
      CALL RESPND(J1,3,137,0,0,JCODE(JC1))
      GOTO (318,350,60),J1
C     ********************************************************************
C     * DETERMINE IF THE TABLE IS TRANSACTION OR DIRECT  REQUIREMENTS *
C     ********************************************************************
350   ITYPE=2
      ISAVE=1
      CALL ANSW(3,ICODE,J1,138,0,0,REGX)
      GOTO (360,500,60,60),J1
C     ********************************************************************
C     *   CREATE REGIONAL TRANSATIONS  TABLE FOR PRODUCING SECTORS    *
C     ********************************************************************
360   CALL READD(1,NR,RL,B,RU,KK,139,NC,2,REGX)
      GOTO (370,360,360,60,360,360,360),KK
370   DO 390 I=1,NR
      A(I,NC+2)=B(I)
      A(NR+2,I)=B(I)
      DO 380 J=1,NC
380   A(I,J)=A(I,J)*B(J)
390   CONTINUE
C     ********************************************************************
C     *   ADD FINAL DEMAND AND PRIMARY PAYMENTS                          *
C     ********************************************************************
C     FINAL DEMAND AND TOTALS FIRST
400   JC=NC+1
      DO 470 I=1,NR
```

```
      IF (I.GE.MSS .AND. I.LE.MSF) GOTO 470
      A(I,JC) = A(I,NC+2)
      DO 460 J=1,NC
460   A(I,JC)=A(I,JC)-A(I,J)
470   CONTINUE
C     PRIMARY PAYMENT AND TOTALS
      JR=NR+1
      DO 480 J=1,NC
      A(JR,J) = A(NR+2,J)
      DO 480 I=1,NR
480   A(JR,J)=A(JR,J)-A(I,J)
C     ***********************************************************************
C     *   CLEAN UP OF ANY LEFT OVER JUNK                                    *
C     **********
      NR=NR+2   ************************************************************
      NC=NC+2
      A(NR,  NC)   =0.0
      A(NR-1,NC)   =0.0
      A(NR,  NC-1) =0.0
      A(NR-1,NC-1) =0.0
      ITYPE=1
500   CALL READFN(FN,IT,140,0,0,JCODE(JC1))
      IF (FN.EQ.'STOP') RETURN
      NAME=FN
C
60    RETURN
      END
C     ***********************************************************************
C     *       SUBROUTINE RESPND (JW                                         *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE RESPND(JWHICH,JMAX,IN,I1,I2,HLPMSG)
      INTEGER JWHICH,JMAX
      CHARACTER*16 HLPMSG
      CHARACTER*32 IANS(3)
      DATA IANS/'YES     ','NO      ','STOP    '/
      CALL ANSW(3,IANS,JWHICH,IN,I1,I2,HLPMSG)
      IF (JWHICH.GT.JMAX) JWHICH=JMAX
      RETURN
      END
C     ***********************************************************************
C     *     SUBROUTINE SUM                                                  *
C     ***********************************************************************
      SUBROUTINE SUM
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
```

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      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C$INCLUDE:'OPTIONS.FOR'
      CHARACTER*32 JCODE(4)
      DATA JCODE/'ROWS    ','COLUMNS ','BOTH ','STOP '/
C
C     ASK IF 'ROW' OR 'COLUMN' SUMS OR 'BOTH' ARE TO BE AUGMENTED.
160   CALL ANSW(4,JCODE,J2,59,0,0,SUMX)
      GOTO(165,165,165,60,160),J2
C     TEST IF THERE IS SPACE FOR THE NEW ROW OR COLUMN
165   IF((J2.LE.2 .AND. NC.EQ.MAXR).OR.(J2.GE.2 .AND. NR.EQ.MAXR))THEN
         CALL MSG(80,MAXR,0)
         GOTO 60
         ENDIF
C
C     ASK FOR THE ROW RANGE
200   CALL READN2(2,2,XL,X,FLOAT(NR),KK,60,0,0,SUMX)
      GOTO(210,200,200,60),KK
210   NRS=X(1)
      NRF=X(2)
C
C     ASK FOR THE COLUMN RANGE
230   CALL READN2(2,2,XL,X,FLOAT(NC),KK,61,0,0,SUMX)
      GOTO(270,230,230,60),KK
270   NCS=X(1)
      NCF=X(2)
      ISAVE=1
C
C     SUM THE ROWS AND CREATE A NEW COLUMN
      IF (J2.EQ.1 .OR. J2.EQ.3) THEN
         NC=NC+1
         DO 310 I=1,NR
310      A(I,NC)=0.0
         DO 300 I=NRS,NRF
            DO 300 J=NCS,NCF
300         A(I,NC)=A(I,NC)+A(I,J)
         ENDIF
C
C     SUM THE COLUMNS AND CREATE A NEW ROW
      IF (J2.EQ.2 .OR. J2.EQ.3) THEN
         NR=NR+1
         DO 320 J=1,NC
320      A(NR,J)=0.0
         DO 330 J=NCS,NCF
            DO 330 I=NRS,NRF
330         A(NR,J)=A(NR,J)+ A(I,J)
         ENDIF
C
60    RETURN
      END
C     ***************************************************************
C     *       SUBROUTINE MACRO                                      *
C     ***************************************************************
C$INCLUDE:'OPTIONS.FOR'
```

```
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      SUBROUTINE MACRO
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      LOGICAL LEXIST,LOPEN
      CHARACTER*16 MACX
      CHARACTER*32 FN
      DATA MACX/'MACRO '/
C     ****************************************************************
C     *  SEE IF THE FILE EXISTS                                      *
C     ****************************************************************
100   CALL READFN(FN,IT,38,0,0,MACX)
      IF (FN.EQ.'STOP') GOTO 60
C *** FOR IBM MAINFRAME ONLY ***
C     LEXIST=.TRUE.
C
      INQUIRE (FILE=FN,EXIST=LEXIST)
      IF (.NOT.LEXIST) THEN
         WRITE (6,110) FN
110      FORMAT (/,' THE MACRO FILE ',A16,' CAN NOT BE LOCATED.',/)
         ERR= 1
         GO TO 100
      ENDIF
C     ****************************************************************
C     * PLACE THE TOKENS FOLLOWING THE MACRO NAME INTO THE '%1'      *
C     ****************************************************************
      DO 120 I = 1,10
      IF (NEXT.LT.LAST) THEN
         IF(TOKARR(NEXT).NE.'%') TSLIST(I)=TOKARR(NEXT)
         ELSE
         TSLIST(I)=' '
         ENDIF
120   NEXT=NEXT+1
      NEXT=1
      LAST=1
      TOKARR(1)='END'
C     ****************************************************************
C     * CLOSE THE CONSOLE AND OPEN THE MACRO FILE                    *
C     ****************************************************************
130   INQUIRE (7,OPENED=LOPEN)
      IF (LOPEN) CLOSE(7)
      OPEN (7,FORM='FORMATTED')
      MACON=.TRUE.
      MSGON=.FALSE.
60    RETURN
      END
C
C     ****************************************************************
```

```
C     *       SUBROUTINE SHIFT                                        *
C     ****************************************************************
      SUBROUTINE SHIFT
C     THIS SUBROUTINE SHIFTS THE TOKENS %0,%1..%9 LEFT 1
C     JUST AS IN THE DOS MACRO LANGUAGE
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      DO 10 I=2,10
10    TSLIST(I-1)=TSLIST(I)
60    TSLIST(10)=' '
      RETURN
      END
C
C     ****************************************************************
C     *       SUBROUTINE MCGOTO   GOTO LINE                          *
C     ****************************************************************
      SUBROUTINE MCGOTO
C     THIS SUBROUTINE IS USED EXCLUSIVELY IN MACROS. THE MACRO FLAG
C     MUST BE ON. THE ROUTINE BRANCHES TO A SPECIFIC LINE AS DENOTED
C     BY ":". THE : SYMBOL IS USED AS AN ADDRESS. THE GOTO FORMAT IS
C     IDENTICAL TO THE DOS BATCH FORMAT.
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      CHARACTER*32 TOKVAL,MATCH,ADD1*1,COLON*1
      DATA COLON/':'/
C
      IF (.NOT.MACON) GOTO 60
      IF (TOKARR(NEXT).EQ.'END') GOTO 60
      TOKVAL=TOKARR(NEXT)
      NEXT=NEXT+1
C
      REWIND (7)
10    READ (7,20,END=100) ADD1,MATCH
20    FORMAT(A1,A32)
      IF (ADD1.NE.COLON) GOTO 10
      IF (MATCH.NE.TOKVAL) GOTO 10
      GOTO 60
C
C     THE LINE IS NOT FOUND
100   WRITE (6,*) 'THE ADDRESS LOCATED IN THE MACRO.  :',TOKVAL
      CALL MACEXT
60    RETURN
```

```
      END
C
C     ***************************************************************
C     *       SUBROUTINE MACEXT     EXIT FROM A MACRO                 *
C     ***************************************************************
      SUBROUTINE MACEXT
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      LOGICAL LOPEN
C
      MSGON=.TRUE.
      MACON=.FALSE.
      NEXT=1
      LAST=1
      TOKARR(1)='END'
      INQUIRE (7,OPENED=LOPEN)
      IF (LOPEN) CLOSE (7)
C     OPEN (5,FILE='CON')
      RETURN
      END
C
C     ***************************************************************
C     *       SUBROUTINE MACASN    ASSIGN A TOKEN TO A %N VARIABLE    *
C     ***************************************************************
      SUBROUTINE MACASN
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      CHARACTER*32 TOKVAR
      IF (NEXT+2.GT.LAST) GOTO 60
      TOKVAR=TOKARR(NEXT)
      READ(TOKVAR,'(1X,I1)',ERR=60) N
      NEXT=NEXT+1
      CALL GETTOK(TOKVAR,0,0,0,IERR,0)
      TSLIST(N+1)=TOKVAR
```

```
60    RETURN
      END
C
C     ****************************************************************
C     *       SUBROUTINE MACINC    INCREMENT %N BY NEXT TOKEN        *
C     ****************************************************************
      SUBROUTINE MACINC
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *          WORKON
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
      CHARACTER*1  TOK32(32)
      CHARACTER*32 TOKVAL
      EQUIVALENCE (TOKVAL,TOK32)
C     CHECK IF THE LIST OF TOKENS IS SUFFICIENT FOR THE PROCEDURE
C     WRITE (6,*) 'TEST NEXT.LE.LAST  NEXT,LAST',NEXT,LAST
      IF (NEXT.GE.LAST) GOTO 10
C     DETERMINE WHICH %N TOKEN IS TO BE INCREMENTED
      TOKVAL=TOKARR(NEXT)
C     WRITE (6,*) 'LOOK FOR %N  TOKVAL=',TOKVAL
      READ(TOKVAL,'(1X,I1)',ERR=10) N
C     WRITE (6,*) 'TSLIST(N,N+1)=',TSLIST(N),TSLIST(N+1)
C     READ THE VALUE OF THE NEXT TOKEN
      CALL READN2(1,1,RL,B,RU,KK,0,0,0,'MACRO ')
      X(1)=B(1)
      IF (TOKARR(NEXT).EQ.'AIJ') THEN
         NEXT=NEXT+1
C        GET THE ROW AND COLUMN NUMBERS
         CALL READN2(2,2,XL,B,XU,KK,0,0,0,'MACRO ')
         J=B(1)
         K=B(2)
         X(2)=A(J,K)
C        WRITE (6,*) 'SECOND AIJ I,J,X2',I,J,X(2)
      -  ELSE
         CALL READN2(1,1,RL,B,RU,KK,0,0,0,'MACRO ')
         X(2)=B(1)
         ENDIF
      X(1)=X(1)+X(2)
      WRITE (TOKVAL,'(F32.4)') X(1)
C     WRITE (6,*) 'VALUE ',TOKVAL,' SAVED IN TSLIST',N+1
C     REMOVE THE BLANKS TO THE LEFT OF THE NUMBER
```

```
      DO 20 I=1,30
      IF (TOK32(I).NE.' ') GOTO 30
20    CONTINUE
30    DO 40 J=I,32
      TOK32(J-I+1)=TOK32(J)
40    TOK32(J)=' '
      TSLIST(N+1)=TOKVAL
C     WRITE (6,*) 'TSLIST(N,N+1)=',TSLIST(N),TSLIST(N+1)
      GOTO 60
C     ERROR WAS FOUND. USE EXIT TO CLEAR ALL MACRO PARAMETERS.
10    CALL MACEXT
60    RETURN
      END
C
C     ****************************************************************
C     *       SUBROUTINE MACIF  'IF' STATEMENT FOR MACROS             *
C     ****************************************************************
      SUBROUTINE MACIF
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      LOGICAL      AIJON
      CHARACTER*2  ICODE(10),JTEST
      CHARACTER*32 TOKVAL,TOK2
      DATA ICODE /'==','=','<','>','S','<=','R','>=','<>','W'/
      AIJON=.FALSE.
C     CHECK FOR THE CORRECT NUMBER OF PARAMETERS FOR 'IF'
C      WRITE (6,*) 'TEST NEXT+2 <= LAST  ,NEXT,LAST',NEXT,LAST
      IF (NEXT+2.GE.LAST) GOTO 300
C     CHECH IF THE AIJ ARGUMENT IS GIVEN 'IF AIJ ROW COL == NUM1 ..'
C     TEST OF THE COMPARISON PARAMETER IS VALID
      IF (TOKARR(NEXT).EQ.'AIJ') THEN
         IF (NEXT+4.GE.LAST) GOTO 300
         JTEST=TOKARR(NEXT+3)
         ELSE
         JTEST=TOKARR(NEXT+1)
         ENDIF
      DO 10 I=1,10
C     WRITE (6,*) 'LOOK FOR OPERATION ',ICODE(I),JTEST
      IF (ICODE(I).EQ.JTEST) GOTO 20
```

```
10    CONTINUE
      GOTO 300
20    IF (I.EQ.1) THEN
         IF (AIJON) GOTO 60
C        WRITE (6,*) 'NEXT,TOKARR(NEXT)=',NEXT,TOKARR(NEXT)
         CALL GETTOK(TOKVAL,0,0,0,IERR,0)
         NEXT=NEXT+1
C        WRITE (6,*) 'NEXT,TOKARR(NEXT)=',NEXT,TOKARR(NEXT)
         CALL GETTOK (TOK2,0,0,0,IERR,0)
C        WRITE (6,*) 'CHARACTER EQUAL ',TOKVAL,TOK2
         IF (TOKVAL.EQ.TOK2) GOTO 60
         GOTO 300
         ENDIF
C     COMPARE THE NUMBER VALUES
C     GET THE FIRST NUMBER
      IF (TOKARR(NEXT).EQ.'AIJ') THEN
         NEXT=NEXT+1
C        GET THE ROW AND COLUMN NUMBERS
         CALL READN2(2,2,XL,B,XU,KK,0,0,0,'MACRO ')
         J=B(1)
         K=B(2)
         X(1)=A(J,K)
C        WRITE (6,*) 'FIRST AIJ I,J,X1',I,J,X(1)
         ELSE
         CALL READN2(1,1,RL,B,RU,KK,0,0,0,'MACRO ')
         X(1)=B(1)
         ENDIF
      NEXT=NEXT+1
C     GET THE SECOND NUMBER
      IF (TOKARR(NEXT).EQ.'AIJ') THEN
         NEXT=NEXT+1
C        GET THE ROW AND COLUMN NUMBERS
         CALL READN2(2,2,XL,B,XU,KK,0,0,0,'MACRO ')
         J=B(1)
         K=B(2)
         X(2)=A(J,K)
C        WRITE (6,*) 'SECOND AIJ I,J,X2',I,J,X(2)
         ELSE
         CALL READN2(1,1,RL,B,RU,KK,0,0,0,'MACRO ')
         X(2)=B(1)
         ENDIF
C     WRITE (6,*) 'NUMBER TEST X1,X2=',X(1),X(2)
      GOTO (60,110,120,130,140,140,150,150,160,170),I
110   IF (X(1) .EQ. X(2)) GOTO 60
         GOTO 300
120   IF (X(1) .LT. X(2)) GOTO 60
         GOTO 300
130   IF (X(1) .GT. X(2)) GOTO 60
         GOTO 300
140   IF (X(1) .LE. X(2)) GOTO 60
         GOTO 300
150   IF (X(1) .GE. X(2)) GOTO 60
```

```
         GOTO 300
160   IF (X(1) .NE. X(2)) GOTO 60
         GOTO 300
170   IF (ABS(X(1)-X(2)).LE. .001) GOTO 60
         GOTO 300
C     THE TEST WAS FALSE, REMOVE THE REST OF THE TOKENS
C300   WRITE (6,*) 'ARGUMENTS CLEARED',(TOKARR(I),I=1,LAST)
300   LAST=1
      NEXT=1
      TOKARR(1)='END'
60    RETURN
      END
      SUBROUTINE PAGE
      WRITE (8,10)
10    FORMAT('1')
      RETURN
      END
C$DEBUG
C     ************************************************************************
C     *       SUBROUTINE GETMAT                                              *
C     ************************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE GETMAT (A,NR,NC,ITYPE,ISAVE,IMSG,HLPMSG)
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
      REAL*4 A(00550,00550),Y(2),YL(2),YU(2)
      INTEGER IT,JA
      LOGICAL LEXIST
      CHARACTER*32 FN,JCODE(4),NAME
      CHARACTER*16 HLPMSG,LFORM
      COMMON/TWO/NAME
      CHARACTER*1  FN1(32)
      EQUIVALENCE  (FN,FN1)
      DATA JCODE/'TRANSACTION','DIRECT','TOTAL','DATA'/
      DATA  YL/1.0,1.0/,YU/00550.0,00550.0/
C     ************************************************************************
C     *  SEE IF THE FILE EXISTS                                              *
C     ************************************************************************
100   JMSG=IMSG
      IF (JMSG.EQ.0) JMSG=38
      CALL READFN(FN,IT,JMSG,0,0,HLPMSG)
      IF (FN.EQ.'STOP') GOTO 60
      IF (ISAVE.EQ.0) GOTO 140
120   CALL RESPND(JA,3,4,0,0,'EXIST          ')
      GOTO (130,140,120,120),JA
130   CALL PUTMAT (A,NR,NC,ITYPE,ISAVE)
140   NAME=FN
```

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      INQUIRE (FILE=FN,EXIST=LEXIST,FORMATTED=LFORM)
C *** IBM MAIN FRAME ONLY *** NEXT LINE
C     LEXIST=.TRUE.
      IF (.NOT.LEXIST) THEN
          WRITE (6,970) FN
          CALL MACEXT
          GO TO 100
      ENDIF
C     ***********************************************************************
C     * DETERMINE THE TYPE OF FILE TO GET '.DAT' OR '.DIF' OR '.PRN'  *
C     ***********************************************************************
C     LOCATE THE '.' IN THE FILE NAME
      DO 150 I=2,29
         IF (FN1(I).NE.'.') GOTO 150
         IF (FN1(I+1).EQ.'D' .AND. FN1(I+2).EQ.'I'
     *      .AND. FN1(I+3).EQ.'F') GOTO 200
         IF (FN1(I+1).EQ.'P' .AND. FN1(I+2).EQ.'R'
     *      .AND. FN1(I+3).EQ.'N') GOTO 300
         GOTO 160
150   CONTINUE
C     ***********************************************************************
C     * READ IN AN UNFORMATTED .DAT FILE  (SAM STANDARD DATA FILE) *
C     ***********************************************************************
160   OPEN (1,FORM='UNFORMATTED')
      READ(1,END=960,ERR=980) NR,NC,ITYPE
      READ(1,END=960,ERR=980) ((A(I,J),I=1,NR),J=1,NC)
      CLOSE (1)
      IF (IT.NE.0) ITYPE=IT
      ISAVE=0
      RETURN
C     ***********************************************************************
C     * READ IN A .DIF FILE                                                 *
C     ***********************************************************************
200   CALL ANSW (4,JCODE,IT,25,0,0,HLPMSG)
      OPEN (1,FORM='FORMATTED')
      READ (1,210,ERR=995) NC,NR
210   FORMAT(////,2X,I2,///,2X,I2,///)
      DO 240 I=1,NR
      READ (1,220,END=920)
220   FORMAT(/)
      DO 240 J=1,NC
      READ (1,230,END=920)
230   FORMAT(A1)
      READ (1,*,END=920) K,A(I,J)
      IF (K.EQ.1) GOTO 910
240   CONTINUE
      IF (IT.NE.0) ITYPE=IT
      IF (ITYPE.EQ.4) ITYPE=5
      GOTO 900
C     ***********************************************************************
C     * READ IN A .PRN FILE                                                 *
C     ***********************************************************************
```

```
300   CALL ANSW (4,JCODE,IT,25,0,0,HLPMSG)
      OPEN (1,FORM='FORMATTED')
       YU(1)=00550
      CALL READD(2,2,YL(1),Y(1),YU(1),KK,105,0,0,HLPMSG)
      IF (KK.EQ.4) GOTO 60
      NR=Y(1)
      NC=Y(2)
      READ(1,*,END=920,ERR=995) ((A(I,J),J=1,NC),I=1,NR)
      IF (IT.NE.0) ITYPE=IT
      IF (ITYPE.EQ.4) ITYPE=5
      READ (1,*,END=900) X
      GOTO 940
900   CLOSE(1)
      RETURN
910   WRITE (6,915)
915   FORMAT(/,' THE DIF FILE HAS TITLES OR CHARACTER STRINGS.',/,
     *       ' REMOVE THE TITLES AND RE-TRANSLATE.')
      GOTO 60
920   WRITE (6,930)
930   FORMAT(/,' INPUT DATA MATRIX IS NOT LARGE ENOUGH GIVEN THE ROW ',
     *        'AND COLUMN SIZE.',/,' THE REMAINING PORTION OF THE ',
     *        'MATRIX IS FILLED WITH ZEROS.',/,' *** WARNING *** ',
     *        'THERE IS A POSSIBILITY OF A DATA WRAP AROUND.')
      GOTO 60
940   CLOSE(1)
      WRITE (6,950) FN
950   FORMAT(/,' THERE IS STILL MORE DATA IN ',A11,/' *** WARNING ***',
     *       ' THERE IS A POSSIBILITY OF A DATA WRAP AROUND.',//)
      GOTO 60
960   WRITE (6,970) FN
970   FORMAT (/,' DATA FILE ',A16,' CAN NOT BE LOCATED.',/)
      CLOSE(1)
      ERR=1
      GO TO 100
980   WRITE (6,990) FN
990   FORMAT (/,' DATA FILE ',A16,' IS NOT AN SAM DATA FILE.')
      GOTO 60
995   WRITE (6,996) FN
996   FORMAT (/,' DATA FILE ',A16,' IS NOT A .DIF OR .PRN DATA FILE.')
60    RETURN
      END
C     ************************************************************
C     *  SUBROUTINE GETTOK                                       *
C     ************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE GETTOK(TOKVAL,IN,I1,I2,ERR,IFLAG)
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
```

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     *           WORKON
      INTEGER NEXT,IN,I1,I2,ERR,IFLAG,PFLAG,TIME1,TIME2, ZERO
      CHARACTER*1 LINE(127),TOK(32),TOKB(32),TOKC(32),DIGIT
C     TSLIST HOLDS THE SAVE '%' RESPONSES
      CHARACTER*32 TOKVAL,TOK2,TOK3,TOK4
      CHARACTER*127 LINE80
      EQUIVALENCE (TOK,TOK2), (TOKB,TOK3), (TOKC,TOK4), (LINE,LINE80)
C
C
C     CHECK IF AN ERROR WAS PRESENT : SEE THE ERR FLAG
      ZERO=0
      IF (ERR.NE.0) THEN
         NEXT=1
         LAST=1
         TOKARR(1)='END  '
C        IF THE MACRO FILE IS OPENED THEN CLOSE IT.
         IF (MACON) GOTO 900
         ENDIF
C
C     CHECK IF THE 'PROMPT' COMMAND WAS ISSUED
10    PFLAG=-1
      TLIST=-1
      IF (TOKARR(NEXT).EQ.'PROMPT ') THEN
         TOK2=TOKARR(NEXT+1)
         IF (TOK(1).EQ.'%') THEN
            NEXT=NEXT+1
C           TLIST=ICHAR(TOK(2))-47
            DIGIT=TOK(2)
            READ(DIGIT,'(I1)') TLIST
            TLIST=TLIST+1
            ELSE
            TLIST=ZERO
            ENDIF
C        MOVE THE REMAINING TOKENS TO THE UTMOST RIGHT
         PFLAG=LAST-NEXT-1
         DO 5 I=ZERO,PFLAG
5        TOKARR(50-I)=TOKARR(LAST-I)
         NEXT=1
         LAST=1
         TOKARR(1)='END  '
         ENDIF
C
      IF (TOKARR(NEXT).EQ.'END') THEN
         ERR = 0
         IF (IFLAG.EQ.1 .AND. ERR.EQ.0) THEN
            IF (TOKVAL.EQ.'END') GO TO 222
            TOKVAL = TOKARR(NEXT)
            TOKARR(NEXT)='END'
            RETURN
            ENDIF
221      IF (MSGON .OR.(PFLAG.GT.0.AND.TLIST.EQ.0))CALL MSG(IN,I1,I2)
222      IF (.NOT.MACON .OR. MSGON .OR. PFLAG.GT.0) THEN
```

```
            WRITE (6,19) PROMPT
19          FORMAT (' ',A6,'>')
            ENDIF
C         IF PROMPT IS ISSUED THEN PFLAG>0 READ FROM TERMINAL
223       IF (PFLAG.GE.0. .OR. (.NOT.MACON)) THEN
            READ (5,20,END=910,ERR=910) LINE80
            ELSE
            READ (7,20,END=900,ERR=900) LINE80
            IF (MACON .AND. MSGON) WRITE (6,*) LINE80
            ENDIF
20        FORMAT (A80)
C         TEST FOR A BLANK LINE
          IF (LINE80.EQ.' ') GOTO 221
C
C         TEST TO SEE IF A '%1' SAVED RESPONSE WAS ENTERED.
          ELSE
          GOTO 100
        ENDIF
C       CHECK IF OUTPUT IS TO GO TO THE PRINTER " COMMAND.
        IF (LINE(1).EQ.'"') GOTO 722
C
C       DECODE THE INPUT LINE INTO TOKENS
        J=1
        DO 201 NEXT = 1,49
          DO 15 I=J,80
            IF (LINE(I).NE.' ') GO TO 25
15          CONTINUE
          TOKARR(NEXT)='END'
          GO TO 55
25        KOUNT = 0
          TOK2 = ' '
          DO 30 J = I,80
            KOUNT = KOUNT + 1
            IF (LINE(J).EQ.' ') GO TO 60
C           CHECK FOR MAXIMUM SIZE OF TOKENS
            IF (KOUNT.EQ.33) GO TO 99
C           CAPITALIZE THE LETTER
C           IF (LINE(J).GE.'A' .AND. LINE(J).LE.'Z')
C     *        LINE(J)=CHAR(ICHAR(LINE(J))-32)
            TOK(KOUNT)=LINE(J)
            IF (J.EQ.80) THEN
              TOKARR(NEXT)='END'
              GO TO 55
              ENDIF
30        CONTINUE
60        TOKARR(NEXT) = TOK2
201     CONTINUE
99      WRITE (6,98)
98      FORMAT (1X,'ERROR TOO LONG')
        ERR = 1
        GO TO 10
C
```

```
C     RESET THE FIRST AND LAST TOKEN POINTERS
55    LAST=NEXT
      NEXT = 1
C
C     IF 'PROMPT' ISSUED PLACE FIRST TOKEN INTO %X. INCREMENT NEXT
      IF (TLIST.GT.0) THEN
         TSLIST(TLIST)=TOKARR(1)
         NEXT=1
         LAST=1
         TOKARR(1)='END'
         TLIST=-1
         ENDIF
C     CHECK IF THE 'PROMPT' COMMAND WAS ISSUED. RESTORE THE STACK
      IF (PFLAG.GT.0) THEN
         DO 110 I=LAST,LAST+PFLAG
         TOKARR(I)=TOKARR(50-PFLAG-LAST+I)
110      CONTINUE
         LAST=LAST+PFLAG
         PFLAG=-1
         GOTO 10
         ENDIF
C
C     SET THE NEXT TOKEN
100   TOKVAL = TOKARR(NEXT)
      IF (TOKVAL.EQ.'END') GOTO 10
      IF (TOKVAL.EQ.'PROMPT') GOTO 10
      NEXT = NEXT + 1
      TOK2=TOKVAL
C
C     CHECK IF THERE IS ANY %N VARIABLES NESTED IN THE TOKEN
      ZERO=0
      J=ZERO
      I=ZERO
      LINE80=TOKVAL
103   J=J+1
104   I=I+1
      IF (I.GT.32 .OR. J.GT.32) GOTO 106
      IF (TOK(I).NE.'%') THEN
         TOKB(J)=TOK(I)
         GOTO 103
         ELSE
C        L=ICHAR(TOK(I+1))-47
         DIGIT=TOK(I+1)
         READ(DIGIT,'(I1)') L
         L=L+1
         IF (L.LT.0 .OR. L.GT.9) THEN
            TOKB(J)=TOK(I)
            GOTO 103
            ELSE
C           SUBSTITUTION OF A %N VARIABLE
            TOK4=TSLIST(L)
            I=I+1
```

```
            DO 105 K=1,32
               IF (TOKC(K).EQ.' ') GOTO 104
               TOKB(J)=TOKC(K)
               J=J+1
               IF (J.GT.32) GOTO 106
105         CONTINUE
            ENDIF
         ENDIF
106   TOKVAL=TOK3
C
C     CHECK IF THE 'MESSAGE' COMMAND WAS ISSUED.
      IF (TOKVAL.EQ.'MESSAGE') THEN
         CALL READST(LINE80,ZERO,ZERO,ZERO,'HELP ')
         WRITE (6,21) LINE80
21       FORMAT (1X,A78)
         GOTO 10
         ENDIF
C
C     CHECK IF THE '"' COMMAND WAS ISSUED.
722   IF (LINE(1).EQ.'"') THEN
         IF (MACON) THEN
            BACKSPACE(7)
            CALL READST(LINE80,ZERO,ZERO,ZERO,'HELP ')
            ZERO=0
            LINE(1)=' '
            WRITE (8,22) LINE80
22          FORMAT (A80)
            ENDIF
         NEXT=1
         TOKARR(NEXT)='END'
         GOTO 10
         ENDIF
C
C     CHECK IF THE FIRST ARGUMENT WAS AN ADDRESS =>  :ADDR
      DIGIT=TOKVAL
C     IF (DIGIT.EQ.':') GOTO 10
C
C     CHECK IF THE FIRST WORD ON THE STACK IS "PROMPT" IF SO START OVER
      IF (TOKVAL.EQ.'PROMPT') THEN
         IF (NEXT.EQ.1) NEXT=1
         GOTO 10
         ENDIF
C
C     CHECK IF THE WORD "BLANK" WAS ENTERED. IF SO REPLACE WITH ' '
      IF (TOKVAL.EQ.'BLANK') TOKVAL=' '
C
C     CHECK FOR "ECHO" COMMAND
      IF (TOKVAL.EQ.'ECHO') THEN
         IF (TOKARR(NEXT).EQ.'OFF') THEN
            MSGON=.FALSE.
            ELSE
            MSGON=.TRUE.
```

```
         ENDIF
        IF (TOKARR(NEXT).NE.'END') NEXT=NEXT+1
        GOTO 10
        ENDIF
C
      RETURN
C
C     RESET THE INPUT FILE DEFINITION TO THE CONSOLE
900   CALL MACEXT
910   GOTO 10
      END
C     ***********************************************************************
C     *       SUBROUTINE INFO                                               *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE INFO
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** TOKS FORTRAN
      INTEGER TLIST
      CHARACTER*8  PROMPT
      CHARACTER*32 TOKARR(50),TSLIST(10)
      LOGICAL MACON,MSGON,WORKON
      COMMON /A/ TOKARR,NEXT,LAST,PROMPT,TLIST,TSLIST,MACON,MSGON,
     *           WORKON
       IF(ITYPE.LT.1.OR.ITYPE.GT.4) ITYPE=5
       IF (ITYPE.EQ.1) WRITE(*,101) NAME,NR,NC
       IF (ITYPE.EQ.2) WRITE(*,102) NAME,NR,NC
       IF (ITYPE.EQ.3) WRITE(*,103) NAME,NR,NC
       IF (ITYPE.EQ.5) WRITE(*,105) NAME,NR,NC
101    FORMAT(/,' YOUR TRANSACTIONS MATRIX ',A8,' NOW HAS ',I3,
     *      ' ROWS AND ',I3,' COLUMNS.',/)
102    FORMAT(/,' YOUR DIRECT REQUIREMENTS MATRIX ',A8,' NOW HAS ',I3,
     *      ' ROWS AND ',I3,' COLUMNS.',/)
103    FORMAT(/,' YOUR TOTAL REQUIREMENTS MATRIX ',A8,' NOW HAS ',I3,
     *      ' ROWS AND ',I3,' COLUMNS.',/)
105    FORMAT(/,' YOUR DATA MATRIX ',A8,' NOW HAS ',I3,
     *      ' ROWS AND ',I3,' COLUMNS.',/)
       RETURN
       END
        SUBROUTINE INVERT
C       SUBROUTINE MINV(A,N,D,L,M)
C
C        PURPOSE: TO INVERT A MATRIX
C
C        DESCRIPTION OF PARAMETERS:
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

C               A       INPUT MATRIX, DESTROYED IN COMPUTATION AND
C                       REPLACED BY RESULTANT MATRIX
C               N       ORDER OF MATRIX "A"
C               D       RESULTANT DETERMINANT
C               L       WORK AREA OF LENGTH "N"
C               M       WORK AREA OF LENGTH "N"
C
C       METHOD:
C               THE STANDARD GAUSS-JORDAN METHOD IS USED. THE
C               DETERMINANT IS ALSO CALCULATED. A DETERMINANT OF
C               ZERO ( 0 ) INDICATES THAT THE MATRIX IS SINGULAR.
C
C*********************************************************************
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** VAR2 FORTRAN
      REAL Q(00550,00550)
      COMMON /SIX/ Q
      REAL*8 Z(00550,00550),HOLD,BIGA,D
      INTEGER*2 L(00371),M(00550)
      EQUIVALENCE (R,Z),(L,Q),(M,L(0371))
C
C     TURN OFF THE FLOPPY DISK DRIVES
C     CALL DRVOFF
C*********************************************************************
C     PREPARE MESSAGE  "PERCENT COMPLETED ##.#%"
C
C     MOVE  THE SINGLE PRECISION MATRIX A INTO DOUBLE PRECISION Z
C     MATRIX Z IS OVERLAYED AND EQUIVALENCED TO (R & A)
C     FOR MEMORY CONSERVATION. MAY NO BE NEEDED.
      DO 200 J=1,NC
      DO 200 I=1,NR
200   Z(I,J)=A(I,J)
      N=NR
C
C       SEARCH FOR THE LARGEST ELEMENT
C
        D=1.0
        DO 80 K=1,N
C*********************************************************************
        L(K)=K
        M(K)=K
        BIGA=Z(K,K)
        DO 20 J=K,N
        DO 20 I=K,N
10      IF(ABS(BIGA) .GE. ABS(Z(I,J))) GOTO 20
```

```
15      BIGA=Z(I,J)
        L(K)=I
        M(K)=J
20      CONTINUE
C
C       INTERCHANGE ROWS
C
        J=L(K)
        IF(J .LE. K)GOTO 35
        DO 30 I=1,N
        HOLD=-Z(K,I)
        Z(K,I)=Z(J,I)
30      Z(J,I)=HOLD
C
C       INTERCHANGE COLUMNS
C
35      I=M(K)
        IF(I .LE. K)GOTO 45
        DO 40 J=1,N
        HOLD=-Z(J,K)
        Z(J,K)=Z(J,I)
40      Z(J,I)=HOLD
C
C       DIVIDE COLUMNS BY MINUS PIVOT ( VALUE OF PIVOT ELEMENT IS
C       CONTAINED IN BIGA )
C
45      IF ( BIGA .NE. 0.0 )GOTO 48
46      D=0.0
        GOTO 250
48      DO 55 I=1,N
        IF( I .EQ. K )GOTO 55
        Z(I,K)=Z(I,K)/( -BIGA )
55      CONTINUE
C
C       REDUCE MATRIX
C
        DO 65 I=1,N
        HOLD=Z(I,K)
        DO 65 J=1,N
        IF( I.EQ.K  .OR.  J.EQ.K )GOTO 65
        Z(I,J)=HOLD*Z(K,J)+Z(I,J)
65      CONTINUE
C
C       DIVIDE ROW BY PIVOT
C
        DO 75 J=1,N
        IF( J .EQ. K ) GOTO 75
70      Z(K,J)=Z(K,J)/BIGA
75      CONTINUE
C
C       PRODUCT OF PIVOTS
C
```

```
        D=D*BIGA
C
C       REPLACE PIVOT BY RECIPROCAL
C
        Z(K,K)=1.0/BIGA
80      CONTINUE
C
C       FINAL ROW AND COLUMN INTERCHANGE
C
        K=N
100     K=K-1
        IF( K .LE. 0 ) GOTO 250
105     I=L(K)
        IF( I .LE. 0 )GOTO 120
        DO 110 J=1,N
        HOLD=Z(J,K)
        Z(J,K)=-Z(J,I)
110     Z(J,I)=HOLD
120     J=M(K)
        IF ( J .LE. K ) GOTO 100
        DO 130 I=1,N
        HOLD=Z(K,I)
        Z(K,I)=-Z(J,I)
130     Z(J,I)=HOLD
        GOTO 100
C
C       MOVE THE DOUBLE PRECISION Z INTO SINGLE PRECISION A
250     DO 260 J=NC,1,-1
        DO 260 I=NR,1,-1
260     A(I,J)=Z(I,J)
C       PLACE THE DETERMINANT INTO B(1)
C       B(1)=D
        END
C     ***********************************************************************
C     *       SUBROUTINE MATH                                               *
C     ***********************************************************************
C$INCLUDE:'OPTIONS.FOR'
      SUBROUTINE MATH
C *** VARS FORTRAN
       REAL*4 R(00550,00550),A(00550,00550),B(00550)
       REAL*4 RL,RU,YL(3),Y(3),YU(3),XL(2),X(2),XU(2)
       INTEGER MAXR,NR,NC,ITYPE,ISAVE
       CHARACTER*32 NAME
       COMMON /ONE/ R,A,B,MAXR,NR,NC,ITYPE,ISAVE,RL,RU,YL,Y,YU,XL,X,
     *              XU,ERR
       COMMON /TWO/ NAME
C *** VAR2 FORTRAN
      REAL Q(00550,00550)
      COMMON /SIX/ Q
      CHARACTER*32 ICODE(3),JCODE(4),KCODE(8),INV,FNAME
      CHARACTER*16 MATHX
      INTEGER*2 IRS,IRF,ICS,ICF,IROW,ICOL,IREV,IMULT,OFFSET
```

```
      SAM.FTN     SOCIOECONOMIC ASSESSMENT MODEL

      DATA ICODE/'ROWS    ','COLUMNS ','STOP    '/
      DATA JCODE/'VECTOR ','SCALAR ','MATRIX ','STOP '/
      DATA KCODE/'+','*','-','/',  'REVERSE','TRANSPOSE','INVERSE',
     *           'STOP'/
      DATA INV,MATHX/'INVERT ','MATH '/
      ISAVE=1
      R1 = -1.0E20
      R2 =  1.0E20
100   IREV=0
      IRS=1
      ICS=1
      IRF=NR
      ICF=NC
      IROW=0
      ICOL=0
      OFFSET=0
105   CALL ANSW(9,KCODE,IMATH,116,0,0,MATHX)
      GOTO (110,110,110,110,850,800,1000,60),IMATH
110   CALL ANSW(5,JCODE,JB,81,0,0,MATHX)
      GOTO (120,200,150,60,110),JB
120   CALL ANSW(3,ICODE,JA,62,0,0,MATHX)
      ICOL=JA-1
      IROW=1-ICOL
      GOTO 200
C
C     GET THE MATRIX
150   IF (IMATH.EQ.2) GOTO 900
      CALL READFN(FNAME,IT,38,0,0,MATHX)
      IF (FNAME.EQ.'IDENTITY') THEN
         DO 170 I=1,NR
         DO 160 J=1,NC
160      R(I,J)=0.0
170      R(I,I)=1.0
      ELSE
      CALL LIFO(FNAME,1,1)
      J=0
      CALL GETMAT (R,IR,IC,J,J,0,MATHX)
      IF(IR.NE.NR .OR. IC.NE.NC) GOTO 950
      ENDIF
      GOTO 500
C
C     GET THE RANGE OF ROWS AND COLUMNS FOR THE VECTOR OR SCALAR
200   CALL READN2(2,2,XL,X,XU,KK,63,0,0,MATHX)
      GOTO(210,200,200,60),KK
C     SELECT THE ROWS TO OPERATE ON
210   IRS=X(1)
      IRF=X(2)
      IR=IRF-IRS+1
C     IF (JB.EQ.2) GOTO 330
C     SELECT THE COLUMNS TO OPERATE ON
300   CALL READN2(2,2,XL,X,XU,KK,66,0,0,MATHX)
      GOTO(310,300,300,60),KK
```

```
310   ICS=X(1)
      ICF=X(2)
      IC=ICF-ICS+1
C
      IF (JB.EQ.2) GOTO 330
      GOTO (220,320,330),JA
C        READ IN A ROW VECTOR
220      CALL READD(IR,IR,RL,B,RU,KK,83,IR,0,MATHX)
         OFFSET=1-IRS
         GOTO 500
C        READ IN A COLUMN VECTOR
320      CALL READD(IC,IC,RL,B,RU,KK,83,IC,0,MATHX)
         OFFSET=1-ICS
         GOTO 500
C        READ IN A SCALAR VALUE
330      CALL READD(1,1,R1,B,R2,KK,67,0,0,MATHX)
         GOTO (500,330,330,60),KK
C
500   IF (IMATH.GE.2) IMATH=IMATH+IREV
      DO 510 I=IRS,IRF
      DO 510 J=ICS,ICF
      IF (JB.EQ.3) THEN
         Z=R(I,J)
         ELSE
         Z=B(MAX(IROW*I+ICOL*J,1)+OFFSET)
         ENDIF
      GOTO (520,530,540,550,560,570,60),IMATH
520   A(I,J) = A(I,J) + Z
      GOTO 510
530   A(I,J) = A(I,J) * Z
      GOTO 510
540   A(I,J) = A(I,J) - Z
      GOTO 510
550   IF (Z.EQ.0) THEN
         A(I,J)=0.0
         ELSE
         A(I,J) = A(I,J) / Z
         ENDIF
      GOTO 510
560   A(I,J) = Z - A(I,J)
      GOTO 510
570   IF (Z.EQ.0) THEN
         A(I,J)=0.0
         ELSE
         A(I,J) = Z / A(I,J)
         ENDIF
      GOTO 510
510   CONTINUE
      GOTO 100
C     ****************************************************************
C     * TRANSPOSE THE  A(I,J)  MATRIX                                *
C     ****************************************************************
```

```
C     *                                                                *
800   K=MAX(NR,NC)
      L=MIN(NR,NC)
      DO 810 I=1,L
         DO 810 J=I+1,K
         XXX=A(I,J)
         A(I,J)=A(J,I)
         A(J,I)=XXX
810   CONTINUE
      I=NR
      NR=NC
      NC=I
      GOTO 100
850   IREV=2
      GOTO 105
C     ***********************************************************************
C     *   PERFORM MATRIX MULTIPLICATION                                     *
C     ***********************************************************************
900   I=0
      IF (IMATH.NE.2) GOTO 100
      IF (IREV.EQ.0) THEN
         CALL GETMAT (Q,IR,IC,I,I,0,MATHX)
C        TURN OFF THE FLOPPY DISK DRIVES
C        CALL DRVOFF
         IF (NC.NE.IR) GOTO 950
         DO 910 I=1,NR
         DO 910 J=1,NC
910      R(I,J)=A(I,J)
      ELSE
         CALL GETMAT (R,IR,IC,I,I,0,MATHX)
         IF (NR.NE.IC) GOTO 950
C        TURN OFF THE FLOPPY DISK DRIVES
C        CALL DRVOFF
         DO 920 I=1,NR
         DO 920 J=1,NC
920      Q(I,J)=A(I,J)
         J=NC
         NR=IR
         NC=IC
         IC=J
      ENDIF
C     PAUSE 'PRESS THE RETURN KEY TO BEGIN MULTIPLICATION'
      DO 930 I1=1,NR
      DO 930 J1=1,IC
      A(I1,J1)=0.0
      DO 930 K1=1,NC
930   A(I1,J1)=A(I1,J1)+R(I1,K1)*Q(K1,J1)
      NC=IC
      GOTO 100
950   WRITE (6,960) NAME,NR,NC,FNAME,IR,IC
960   FORMAT (' THE MATRICES ARE NOT COMPATABLE:',/,1X,
     *A24,' HAS ',I3,' ROWS AND ',I3,' COLUMNS,',/,1X,
```

```
     *A24,' HAS ',I3,' ROWS AND ',I3,' COLUMNS,')
      GOTO 100
1000  CALL INVERT
      GOTO 100
60    ITYPE=5
      RETURN
      END
      SUBROUTINE OPENER
      CHARACTER*18 FN1,FN2
      DATA FN1/'SAM'/,FN2/'HELPMSG'/
      OPEN (3,FILE=FN1,ACCESS='DIRECT',FORM='FORMATTED',
     -      RECL=80)
      OPEN (10,FILE=FN2,FORM='FORMATTED',
     *         ACCESS='DIRECT',RECL=80)
C     FILE (1) IS USED IN INDEX, PUTINX, GETMAT & PRINT.
      RETURN
      END
```

SAM.MSG Direct access message file for SAM.FTN

```
 160 180
  18  19  20  21  23  24  25  26   0   0  29  31  32  34  35  36  37  38  39  40
  41  43  44  46  47  49  50  51  53  54 173  55  56  57  58  59  60  61  62  63
  64  65  66  68  69  70   0  71  72  73  74  75   0  76  77  78  79  80  81  82
  83  84  85  86   0  87  88  89  91  92   0  94  95  96  97   0   0 170 171 172
 100 101 102   0 103 104 105 106 107 108 109 110 111 112  28 174 175  99  98   0
   0   0   0 113 114 115 116 117 118 119 120 121 122 124 125 126 127 128 129 130
 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156
 159 161 162 163 164 165 166 167 168 169 176   0   0   0   0   0   0   0   0   0
   1   1   1   2   1   1   1   1   0   0   2   1   2   1   1   1   1   1   1   1
   2   1   2   1   2   1   1   2   1   1   1   1   1   1   1   1   1   1   1   1
   1   1   2   1   1   1   0   1   1   1   1   1   0   1   1   1   1   1   1   1
   1   1   1   1   0   1   1   2   1   2   0   1   1   1   1   0   0   1   1   1
   1   1   1   0   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   0
   0   0   0   1   1   1   1   1   1   1   1   1   2   1   1   1   1   1   1   1
   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1   1
   2   1   1   1   1   1   1   1   1   1   3   0   0   0   0   0   0   0   0   0
0'What option would you like ?'
0'Enter the option for which you want documentation'
0'Have the Primary Payments row(s) and Final Demand columns(s) been deleted?'
0'You have made changes to your matrix.'
0'Do you want to save your matrix before quitting ?'
2'Enter the ',I3,' values for column ',I3,' or stop for a new option.'
2'Enter the ',I3,' values for row ',I3,' or stop for a new option.'
0'Enter the row number you want to adjust.'
0'Enter the adjustment factor.'
0'Are the ROW or COLUMN totals or BOTH or NONE included in your matrix ?'
0'Do you want to use ROW or COLUMN totals to adjust the matrix ?'
0'Enter the sector number and the change in production desired.'
0'(Enter STOP to proceed to calculations.)'
0'Are the row totals and the column totals included in the matrix?'
0'Enter the row number which represents column totals'
0'and the column number which represents row totals.'
0'Enter Shift or Ctrl or Alternate or a blank and the F key you wish to define.'
0'Enter the commands between double quotation marks. ex.  "PRINT Y TERM"'
2'The ending row or col',I3,' is not greater than the initial row or col',I3
0'Enter the names to locate in the directory. ("*" and "?" are permitted)'
0'Enter the beginning and ending rows to be balanced.'
1'Enter the ',I3,' row control total values.'
1'Enter the ',I3,' column control total values.'
0'Do you want the new row totals column and column totals row'
0'included as part of your new matrix ?'
0'Do you want the control totals included as part of your new matrix ?'
0'Do you want the row totals column and column totals row '
0'and differences printed ?'
0'What name do you wish to call this matrix ?'
0'Is this a Transaction(s), Direct Requirement(s), Total Requirement(s), or'
0'Data Matrix ?'
0'How many rows will your matrix have ?'
0'Enter the row number, column number, and new value, or stop'
0'Your row or column selection is greater than the number'
```

```
SAM.MSG   Direct access message file for SAM.FTN

0'of rows or columns in your current matrix.'
0'Do you want to collapse ROWS or COLUMNS ?  Or, stop for a new option? '
0'Enter the beginning and ending rows you want collapsed.'
0'Enter the beginning and ending columns you want collapsed.'
0'Do you want to delete ROWS, COLUMNS or ELEMENTS ? (or stop for a new option?)'
0'Enter the beginning and ending rows you want deleted.'
0'Enter the beginning and ending columns you want deleted.'
0'Do you want to delete from a ROW or a COLUMN ? Or, stop for a new option? '
0'Enter the row and column number of the value you wish to delete.'
0'What data file do you wish to get ?'
0'Do you want to insert into a ROW or a COLUMN ? Or, stop for a new option? '
0'Enter the row number, column number, and new value.'
0'Do you want to enter a description with this file?'
0'Enter the directory with a colon (examples   AMS1:)'
0'The primary payments row(s) and final demand column(s) must first be deleted.'
0'Use the Delete command to remove these sectors.'
0'Do you want to move a ROW or COLUMN ?'
0'Which row do you want to move ?'
0'What row number is it to be ?'
0'Which column do you want to move ?'
0'What column number is it to be ?'
1'Enter the ',I3,' sector output totals.'
0'Enter the ending column number of the endogenous sectors.'
1'Enter the ',I3,' price indices in the price vector.'
0'Are multipliers included as part of your matrix ?'
0'Do you want to print the entire matrix ? (Yes, No or Format)'
0'Enter the beginning and ending rows you want printed.'
0'Enter the beginning and ending columns you want printed.'
0'Do you want this printed on the TERMINAL or PRINTER ?'
0'Do you want to sum across ROWS, down COLUMNS, or BOTH?'
0'Enter the beginning and ending rows for which you desire sums.'
0'Enter the beginning and ending columns for which you desire sums.'
0'Do you want to operate on ROWS or COLUMNS ?'
0'Enter the beginning and ending row numbers you want to operate on.'
0'Do you want to save a DIRECT requirements, IMPACT, or TOTALS table ?'
0'Enter the beginning and ending column numbers you want to operate. '
0'Enter the constant.'
0'Enter the beginning and ending columns over which you want'
0'the rows summed.'
0'Enter the beginning and ending rows over which you want the columns summed.'
0'Enter the beginning and ending row numbers of the endogenous sectors '
0'for which Final Demands are known. Or, Stop to terminate.'
0'Do you want to enter a ROW or a COLUMN?'
1'Enter the ',I3,' estimated final demands.'
0'What file do you wish to get the data from ?'
0'What name will this matrix be called on disk?'
0'Enter the row number of your column totals.'
0'Enter the column number of your row totals.'
0'Do you want to operate by a  VECTOR, SCALAR or MATRIX ?'
1'Enter the ',I3,' values in the vector.'
1'Enter the ',I3,' values in the vector.'
0'Enter Detail, Nodetail, Change, Save or Stop.'
```

```
SAM.MSG   Direct access message file for SAM.FTN

0'Enter the number of the row you wish to get form the matrix.'
0'Enter the name of the data file you wish to delete.'
0'Do you want the totals added to your matrix ?'
0'Are ROW totals, COLUMN totals, BOTH or NONE included in your matrix ?'
0'Enter the row number of your column totals.'
0'Enter the column number of your row totals.'
0'Enter the number of the column you wish to get from the matrix.'
1'Iteration # ',I2,'. Enter Step, Run, Option or stop.'
0'Enter row number, column number, and the new value.'
0'The routine requires ROW totals. Use the ADDCOL or TOTAL option.'
0'Enter the number of ROWS and COLUMNS in the .PRN data file.'
0'Enter the new value.'
0'Enter the name of the table you want to POST MULTIPLY the current table by.'
0'Type 1 or  type 2 ?'
0'Do you want to replace the file on disk?'
0'* Warning *  The matrix is not a DIRECT REQUIREMENTS table.'
0'* Error *  The matrix is not correctly dimensioned.'
0'Enter the Household sector ROW number.'
0'Enter the type of multiplier :'
0'Employment, Output, Income, Industry or Supply.'
0'Simple or Full ?'
0'Is the Household row included in the matrix ?'
0'Enter the math option'
1'Enter the physical labor input coefficients for the ',I2,' sectors.'
0'Enter the USER option'
0'Enter the dimension of the identity matrix'
0'Do you want to CALCULATE the inverse or GET the inverse from disk?'
0'Enter the file description. (%n variables are permitted.)
0'                    '
0'                    '
0'                    '
0'                    '
0'                    '
0'Enter the Regionalization option: SLQ, CIQ, PLQ, SDP, or RAS.'
0'Enter the Reference economy direct requirements file name.'
0'Enter the maximum value the location quotient can have. (0.0 to 1.0)'
1'Enter the ',I3,' Reference economy activity sector totals.'
1'Enter the ',I3,' Regional  economy activity sector totals.'
0'Enter the Reference economy total activity.'
0'Enter the Regional  economy total activity.'
1'Enter the ',I3,' Reference economy purchase-only sector totals.'
1'Enter the ',I3,' Regional  economy purchase-only sector totals.'
0'Enter the number or interindustrial endogenous sectors.'
1'Enter the ',I3,' actual regional output values.'
1'Enter the ',I3,' actual regional final demand values.'
1'Enter the ',I3,' regional total interindustrial sales by sector.'
1'Enter the ',I3,' regional total interindustrial input purchases by sector.'
0'The sum of the sales do not equal the sum of the purchases. RAS terminated.'
1'Enter the ',I3,' regional total gross outputs.'
0'Do you wish to iterate for 10 more times?'
0'Do you wish to create a DIRECT requirements table or a TRANSACTION table?'
1'Enter the corresponding ',I3,' regional sector totals.'
```

```
SAM.MSG   Direct access message file for SAM.FTN

0'Enter the name of the newly created regional table.'
1'** Warning ** The matrix has the maximum  number of rows or columns of ',I3
0'Do you wish to append a ROW, COLUMN, or MATRIX?'
0'Enter the format option : Columns, Decimal, Length, Width, Header, Footer,'
0'                          Setup,   Default, Clear,  File,  Status  or Stop.'
1'Enter the number of Columns per page. (currently=',I2,')'
1'Enter the number of decimal points to display in the data. (currently=',I2,')'
1'Enter the number of lines per page. (currently=',I3,')'
1'Enter the column width. i.e.number of characters. (currently=',I2,')'
0'Enter the printer control codes. (or stop)'
1'Enter the Heading for line number ',I1
0'Enter the Heading line number you want to change. (or stop).'
0'Enter the Footer. (or stop) '
0'What is the name of the file you wish to create in printing?'
0'Do you wish to append rows, columns or a matrix?'
0'Do you wish to append the matrix by rows (under) or by columns (right side)?'
1'The maximum number of rows or columns may not be exceeded. max=',I3
0'Enter the description of the file.  (%n variables are permitted.)'
0'Are the ROW totals included in the matrix?'
0'Are the COLUMNS totals included in the matrix?'
0'Do you want to reset any endogenous sectors where final demands and'
0'total gross outputs are known? (This uses the reference economy direct'
0'requirements.)'
```

APPENDIX B

APPENDIX B

I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
	1. Livestock and livestock products	
1.0100	Diary farm products	0241, pt. 0191, pt. 0259, pt. 0291
1.0200	Poultry and eggs	025 (excl. 0254 and pt. 0259), pt. 0191, pt. 0219, pt. 0291
1.0301	Meat animals	021 (excl. pt. 0219), pt. 0191, pt. 0259, pt. 0291
1.0302	Miscellaneous livestock	027 (excl. plt. 0279), pt. 0191, pt. 0219, pt. 0259, pt. 0291
	2. Other agricultural products	
2.0100	Cotton	0131, pt. 0191, pt. 0219 pt. 0259, pt. 0291
2.0201	Food grains	pt. 011, pt. 0191, pt. 0219 pt. 0259, pt. 0291
2.0202	Feed grains	pt. 011, pt. 0139, pt. 0191 pt. 0219, plt. 0259, pt. 0291
2.0203	Grass seeds	pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0300	Tobacco	0132, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0401	Fruits	pt. 017, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0402	Tree nuts	0173, pt. 0179, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0501	Vegetables	0134, 0161, pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
2.0502	Sugar crops	0133, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0503	Miscellaneous crops	pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0600	Oil bearing crops	0116, pt. 0119, pt. 013, pt. 0173, pt. 0219, pt. 0259, pt. 0291
2.0701	Forest products	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
2.0702	Greenhouse and nursery products	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
	3. Forestry and fishery products	
3.0001	Forestry products	081-4, 097
3.0002	Commercial fishing	091
	4. Agricultural, forestry, and fishery services	
4.0001	Agricultural, forestry, and fishery services	0254, 07 (excl. 074, and 078), 085, 092, pt. 0279
4.0002	Landscape and horticultural services	078
	5. Iron and ferroalloy ores mining	
5.0000	Iron and ferroalloy ores mining	101, 106
	6. Nonferrous metal ores mining	
6.0100	Copper ore mining	102
6.0200	Nonferrous metal ores mining, except copper	103-5, pt. 108, 109
	7.Coal mining	
7.0000	Coal mining	1111, pt. 1112, 1211, pt. 1213
	8. Crude petroleum and natural gas	
8.0000	Crude petroleum and natural gas	131, 132
	9. Stone and clay mining and quarrying	
9.0001	Dimension, crushed and broken stone mining and quarrying	141-2

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
9.0002	Sand and gravel mining	144
9.0003	Clay, ceramic, and refractory minerals mining	145
9.0004	Nonmetallic mineral services and miscellaneous minerals mining	pt. 148, 149
	10. Chemical and fertilizer mineral mining	
10.0000	Chemical and fertilizer mineral mining	147
	11. New construction	
11.0101	New residential 1-unit structures, nonfarm	pt. 15, pt. 17, pt. 6552
11.0102	New residential 2-4 unit structured, nonfarm	pt. 15-17
11.0103	New residential garden apartments	pt. 15017, pt. 6552
11.0104	New residential high-rise apartments	pt. 15-17
11.0105	New residential additions and alterations, nonfarm	pt. 15-17
11.0106	New hotels and motels	pt. 15-17
11.0107	New dormitories and other group housing	pt. 15-17
11.0201	New industrial buildings	pt. 15-17
11.0202	New office buildings	pt. 15-17
11.0203	New warehouses	pt. 15-17
11.0204	New garages and service stations	pt. 15-17
11.0205	Nes stores and restaurants	pt. 15-17
11.0206	New religious buildings	pt. 15-17
11.0207	New educational buildings	pt. 15-17
11.0231	New hospitals	pt. 15-17
11.0232	New residential institutions and other health related facilities	pt. 15-17
11.0241	New amusement and recreation buildings	pt. 15-17
11.0250	Other new nonfarm buildings	pt. 15-17
11.0301	New telephone and telegraph facilities	pt. 16-17
11.0302	New railroads	pt. 16-17
11.0303	New electric utility facilities	pt. 16-17
11.0304	New gas utility facilities	pt. 16-17
11.0305	New petroleum pipelines	pt. 16-17
11.0306	New water supply facilities	pt. 16-17
11.0307	New sewer system facilities	pt. 16-17
11.0308	New local transit facilities	pt. 16-17

APPENDIX B

I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
11.0400	New highways and streets	pt. 16-17
11.0501	New farm housing units and additions and alterations	pt. 15, pt. 17
11.0502	New farm service facilities	pt. 15, pt. 17
11.0601	New petroleum and natural gas well drilling	pt. 138
11.0602	New petroleum, natural gas, and solid mineral exploration	pt. 108, pt. 1112, pt. 1213, pt. 138, pt. 148
11.0603	New access structures for solid mineral development	pt. 108, pt. 1112, pt. 1213, pt. 148
11.0701	New military facilities	pt. 15-17
11.0702	New dams and reservoirs	pt. 15-17
11.0703	Other new conservation and development facilities	pt. 15-17
11.0704	Other new nonbuilding facilities	pt. 15-17
	12. Maintenance and repair construction	
12.0100	Maintenance and repair, residential	pt. 15, pt. 17
12.0201	Maintenance and repair of other nonfarm buildings	pt. 15-17
12.0202	Maintenance and repair of farm residential buildings	pt. 1215, pt. 17
12.0203	Maintenance and repair of farm service facilities	pt. 15, pt. 17
12.0204	Maintenance and repair of telephone and telegraph facilities	pt. 16-17
12.0205	Maintenance and repair of railroads	pt. 16-17
12.0206	Maintenance and repair of electric utility facilities	pt. 16-17
12.0207	Maintenance and repair of gas utility facilities	pt. 16-17
12.0208	Maintenance and repair of petroleum pipelines	pt. 16-17
12.0209	Maintenance and repair of water supply facilities	pt. 16-17
12.0210	Maintenance and repair of sewer facilities	pt. 16-17
12.0211	Maintenance and repair of local transit facilities	pt. 16-17
12.0212	Maintenance and repair of military facilities	pt. 15-17
12.0213	Maintenance and repair of conservation and development facilities	pt. 15-17
12.0214	Maintenance and repair of highways and streets	pt. 16-17
12.0215	Maintenance and repair of petroleum and natural gas wells	pt. 138
12.0216	Maintenance and repair of other nonbuilding facilities	pt. 15-17
	13. Ordnance and accessories	
13.0100	Guided missiles and space vehicles	3761

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
13.0200	Ammunition, except for small arms, n.e.c.	3483
13.0300	Tank and tank components	3795
13.0500	Small arms	3484
13.0600	Small arms ammunition	3482
13.0700	Other ordnance and accessories	3489
	14. Food and kindred products	
14.0101	Meat packing plants	2011
14.0102	Sausages and other prepared meats	2013
14.0103	Poultry dressing plants	2016
14.0104	Poultry and egg processing	2017
14.0200	Creamery butter	2021
14.0300	Cheese, natural and processed	2022
14.0400	Condensed and evaporated milk	2023
14.0500	Ice cream and frozen deserts	2024
14.0600	Fluid milk	2026
14.0700	Canned and cured sea foods	2091
14.0800	Canned specialties	2032
14.0900	Canned fruits and vegetables	2033
14.1000	Dehydrated food products	2034
14.1100	Pickles, sauces, and salad dressings	2035
14.1200	Fresh or frozen packaged fish	2092
14.1301	Frozen fruits, fruit juices and vegetables	2037
14.1302	Frozen specialties	2038
14.1401	Flour and other grain mill products	2041
14.1402	Cereal breakfast foods	2043
14.1403	Blended and prepared flour	2045
14.1501	Dog, cat, and other pet food	2047
14.1502	Prepared feeds, n.e.c.	2048
14.1600	Rice milling	2044
14.1700	Wet corn milling	2046
14.1801	Bread, cake, and related products	2051
14.1802	Cookies and crackers	2052

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
14.1900	Sugar	2061-3
14.2001	Confectionery products	2065
14.2002	Chocolate and cocoa products	2066
14.2003	Chewing gum	2067
14.2101	Malt beverages	2082
14.2102	Malt	2083
14.2103	Wines, brandy, and brandy spirits	2084
14.2104	Distilled liquor, except brandy	2085
14.2200	Bottled and canned soft drinks	2086
14.2300	Flavoring extracts and sirups, n.e.c.	2087
14.2400	Cottonseed oil mills	2074
14.2500	Soybean oil mills	2075
14.2600	Vegetable oil mills, n.e.c.	2076
14.2700	Animal and marine fats and oils	2077
14.2800	Roasted coffee	2095
14.2900	Shortening and cooking oils	2079
14.3000	Manufactured ice	2097
14.3100	Macaroni and spaghetti	2098
14.3200	Food preparations, n.e.c.	2099
	15. Tobacco manufactures	
15.0101	Cigarettes	211
15.0102	Cigars	212
15.0103	Chewing and smoking tobacco	213
15.0200	Tobacco stemming and redrying	214
	16. Broad and narrow fabrics, yarn and thread mills	
16.0100	Broadwoven fabric mills and fabric finishing plants	221-3, 2261-2
16.0200	Narrow fabric mills	224
16.0300	Yarn mills and finishing of textiles, n.e.c.	2269. 2281-3
16.0400	Thread mills	2284
	17. Miscellaneous textile goods and floor coverings	
17.0100	Floor coverings	227
17.0200	Felt goods, n.e.c.	2291

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
17.0300	Lace goods	2292
17.0400	Padding and upholstery filling	2293
17.0500	Processed textile waste	2294
17.0600	Coated fabrics, not rubberized	2295
17.0700	Tire cord and fabric	2296
17.0900	Cordage and twine	2296
17.1001	Nonwoven fabrics	2297
17.1002	Textile goods, n.e.c.	2299
	18. Apparel	
18.0101	Women's hosiery, except socks	2251
18.0102	Hosiery, n.e.c.	2252
18.0201	Knit outerwear mills	2253
18.0202	Knit underwear mills	2254
18.0203	Knitting mills, n.e.c.	2259
18.0300	Knit fabric mills	2257-8
18.0400	Apparel made from purchased materials	231-8, 39996
	19. Miscellaneous fabricated textile products	
19.0100	Curtains and draperies	2391
19.0200	Housefurnishings, n.e.c.	2392
19.0301	Textile bags	2393
19.0302	Canvas and related products	2394
19.0303	Pleating and stitching	2395
19.0304	Automotive and apparel trimmings	2396
19.0305	Schiffli machine embroideries	2397
19.0306	Fabricated textile products, n.e.c.	2399
	20. Lumber and wood products, except containers	
20.0100	Logging camps and logging contractors	2411
20.0200	Sawmills and planing mills, general	2421
20.0300	Hardwood dimension and flooring mills	2426
20.0400	Special product sawmills, n.e.c.	2429
20.0501	Millwork	2431
20.0502	Wood kitchen cabinets	2434

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
20.0600	Veneer and plywood	2435-6
20.0701	Structural wood members, n.e.c.	2439
20.0702	Prefabricated wood buildings	2452
20.0800	Wood preserving	2491
20.0901	Wood pallets and skids	2448
20.0902	Particleboard	2492
20.0903	Wood products, n.e.c.	2499
	21. Wood containers	
21.0000	Wood containers	2441, 2449
	22. Household furniture	
22.0101	Wood household furniture	2511
22.0102	Household furniture, n.e.c.	2519
22.0103	Wood TV and radio cabinets	2517
22.0200	Upholstered household furniture	2512
22.0300	Metal household furniture	2514
22.0400	Mattresses and bedsprings	2515
	23. Other furniture and fixtures	
23.0100	Wood office furniture	2521
23.0200	Metal office furniture	2522
23.0300	Public building furniture	2531
23.0400	Wood partitions and fixtures	2541
23.0500	Metal partitions and fixtures	2542
23.0600	Drapery hardware and blinds and shades	2591
23.0700	Furniture and fixtures, n.e.c.	2599
	24. Paper and allied products, except containers	
24.0100	Pulp mills	261
24.0200	Paper mills, except building paper	262
24.0300	Paperboard mills	263
24.0400	Envelopes	2642
24.0500	Sanitary paper products	2647
24.0602	Building paper and board mills	266
24.0701	Paper coating and glazing	2641

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
24.0702	Bags, except textile	2643
24.0703	Die-cut paper and board	2645
24.0704	Pressed and molded pulp goods	2646
24.0705	Stationery products	2648
24.0706	Converted paper products, n.e.c.	2649
	25. Paperboard containers and boxes	
25.0000	Paperboard containers and boxes	265
	26. Printing and publishing	
26.0100	Newspapers	271
26.0200	Periodicals	272
26.0301	Book publishing	2731
26.0302	Book printing	2732
26.0400	Miscellaneous publishing	274
26.0501	Commercial printing	2751-2, 2754
26.0502	Lithographic platemaking and services	2795
26.0601	Manifold business forms	276
26.0602	Blankbooks and looseleaf binders	2782
26.0700	Greeting card publishing	277
26.0801	Engraving and plate printing	2753
26.0802	Bookbinding and related work	2789
26.0803	Typesetting	2791
26.0804	Photoengraving	2793
26.0805	Electrotyping and stereotyping	2794
	27. Chemicals and selected chemical products	
27.0100	Industrial inorganic and organic chemicals	281 (excl. 28195), 2865, 2869
27.0201	Nitrogenous and phosphatic fertilizers	2873-4
27.0202	Fertilizers, mixing only	2875
27.0300	Agricultural chemicals, n.e.c.	2879
27.0401	Cum and wood chemicals	2861
27.0402	Adhesives and sealants	2891
27.0403	Explosives	2892
27.0404	Printing ink	2893

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
27.0405	Carbon black	2895
27.0406	Chemical preparations, n.e.c.	2899
	28. Plastics and synthetic materials	
28.0100	Plastics materials and resins	2821
28.0200	Synthetic rubber	2822
28.0300	Cellulosic man-made fibers	2823
28.0400	Organic fibers, noncellulosic	2824
	29. Drugs, cleaning and toilet preparations	
29.0100	Drugs	283
29.0201	Soap and other detergents	2841
29.0202	Polishes and sanitation goods	2842
29.0203	Surface active agents	2843
29.0300	Toilet preparations	2844
	30. Paints and allied products	
30.0000	Paints and allied products	285
	31. Petroleum refining and related industries	
31.0101	Petroleum refining	291
31.0102	Lubricating oils and greases	2992
31.0103	Products of petroleum and coal, n.e.c.	2999
31.0200	Paving mixtures and blocks	2951
31.0300	Asphalt felts and coatings	2952
	32. Rubber and miscellaneous plastics products	
32.0100	Tires and inner tubes	301
32.0200	Rubber and plastics footwear	302
32.0301	Reclaimed rubber	303
32.0302	Fabricated rubber products, n.e.c.	306
32.0400	Miscellaneous plastics products	307
32.0500	Rubber and plastics hose and belting	304
	33. Leather tanning and finishing	
33.0001	Leather tanning and finishing	311
	34. Footwear and other leather products	
34.0100	Boot and shoe cut stock and findings	313

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
34.0201	Shoes, except rubber	3143-9
34.0202	House slippers	3142
34.0301	Leather gloves and mittens	315
34.0302	Luggage	316
34.0303	Women's handbags and purses	3171
34.0304	Personal leather goods	3172
34.0305	Leather goods, n.e.c.	319
	35. Glass and glass products	
35.0100	Glass and glass products, except containers	321, 3229, 323
35.0200	Glass containers	3221
	36. Stone and clay products	
36.0100	Cement, hydraulic	324
36.0200	Brick and structural clay tile	3251
36.0200	Ceramic wall and floor tile	3253
36.0400	Clay refractories	3255
36.0500	Structural clay products, n.e.c.	3259
36.0600	Vitreous plumbing fixtures	3261
36.0701	Vitreous china food utensils	3262
36.0702	Fine earthenware food utensils	3263
36.0800	Porcelain electrical supplies	3264
36.0900	Pottery products, n.e.c.	3269
36.1000	Concrete block and brick	3271
36.1100	Concrete products, n.e.c.	3272
36.1200	Ready mixed concrete	3273
36.1300	Lime	3274
36.1400	Gypsum products	3275
36.1500	Cutstone and stone products	328
36.1600	Abrasive products	3291
36.1700	Asbestos products	3292
36.1800	Gaskets, packing and sealing devices	3293
36.1900	Minerals, ground or treated	3295
36.2000	Mineral wool	3296

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
36.2100	Nonclay refractories	3297
36.2200	Nonmetallic mineral products, n.e.c.	3299
	37. Primary iron and steel manufacturing	
37.0101	Blast furnaces and steel mills	3312
37.0102	Electrometallurgical products	3313
37.0103	Steel wire and related products	3315
37.0104	Cold finishing of steel shapes	3316
37.0105	Steel pipe and tubes	3317
37.0200	Iron and steel foundries	332
37.0300	Iron and steel forgings	3462
37.0401	Metal heat treating	3398
37.0402	Primary metal products, n.e.c.	3399
	38. Primary nonferrous metals manufacturing	
38.0100	Primary copper	3331
38.0200	Primary lead	3332
38.0300	Primary zinc	3333
38.0400	Primary aluminum	3334, 28195
38.0500	Primary nonferrous metals, n.e.c.	3339
38.0600	Secondary nonferrous metals	334
38.0700	Copper rolling and drawing	3351
38.0800	Aluminum rolling and drawing	3353-5
38.0900	Nonferrous rolling and drawing, n.e.c.	3356
38.1000	Nonferrous wire drawing and insulating	3357
38.1100	Aluminum castings	3361
38.1200	Brass, bronze, and copper castings	3362
38.1300	Nonferrous castings, n.e.c.	3369
38.1400	Nonferrous forgings	3463
	39. Metal containers	
39.0100	Metal cans	3411
39.0200	Metal barrels, drums, and pails	3412
	40. Heating, plumbing, and fabricated structural metal products	
40.0100	Metal sanitary ware	3431

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
40.0200	Plumbing fixture fittings and trim	3432
40.0300	Heating equipment, except electric	3433
40.0400	Fabricated structural metal	3441
40.0500	Metal doors, sash, and trim	3442
40.0600	Fabricated plate work (boiler shops)	3443
40.0700	Sheet metal work	3444
40.0800	Architectural metal work	3446
40.0901	Prefabricated metal buildings	3448
40.0902	Miscellaneous metal work	3449
	41. Screw machine products and stampings	
41.0100	Screw machine products and bolts, nuts, rivets, and washers	345
41.0201	Automotive stampings	3465
41.0202	Crowns and closures	3466
41.0203	Metal stampings, n.e.c.	3469
	42. Other fabricated metal products	
42.0100	Cutlery	3421
42.0201	Hand and edge tools, n.e.c.	3423
42.0202	Hand saws and saw blades	3425
42.0300	Hardware, n.e.c.	3429
42.0401	Plating and polishing	3471
42.0402	Metal coating and allied services	3479
42.0500	Miscellaneous fabricated wire products	3495-6
42.0700	Steel springs, except wire	3493
42.0800	Pipe, valves, and pipe fittings	3494, 3498
42.1000	Metal foil and leaf	3497
42.1100	Fabricated metal products, n.e.c.	3499
	43. Engines and turbines	
43.0100	Turbines and turbine generator sets	3511
43.0200	Internal combustion engines, n.e.c.	3519
	44. Farm and garden machinery	
44.0001	Farm machinery and equipment	3523
44.0002	Lawn and garden equipment	3524

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
	45. Construction and mining machinery	
45.0100	Construction machinery and equipment	3531
45.0200	Mining machinery, except oil field	3532
45.0300	Oil field machinery	3533
	46. Materials handling machinery and equipment	
46.0100	Elevators and moving stairways	3534
46.0200	Conveyors and conveying equipment	3535
46.0300	Hoists, cranes, and monorails	3536
46.0400	Industrial trucks and tractors	3537
	47. Metalworking machinery and equipment	
47.0100	Machine tools, metal cutting types	3541
47.0200	Machine tools, metal forming types	3542
47.0300	Special dies and tools and machine tool accessories	3544-5
47.0401	Power driven hand tools	3546
47.0402	Rolling mill machinery	3547
47.0403	Metalworking machinery, n.e.c.	3549
	48. Special industry machinery and equipment	
48.0100	Food products machinery	3551
48.0200	Textile machinery	3552
48.0300	Woodworking machinery	3553
48.0400	Paper industries machinery	3554
48.0500	Printing trades machinery	3555
48.0600	Special industry machinery, n.e.c.	3559
	49. General industrial machinery and equipment	
49.0100	Pumps and compressors	3561, 3563
49.0200	Ball and roller bearings	3562
49.0300	Blowers and fans	3564
49.0400	Industrial patterns	3565
49.0500	Power transmission equipment	3566, 3568
49.0600	Industrial furnaces and ovens	3567
49.0700	General industrial machinery, n.e.c.	3569
	50. Miscellaneous machinery, except electrical	

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
50.0001	Carburetors, pistons, rings, valves	3592
50.0002	Machinery, except electrical, n.e.c.	3599
	51. Office, computing, and accounting machines	
51.0101	Electronic computing equipment	3573
51.0102	Calculating and accounting machines	3574
51.0300	Scales and balances	3576
51.0400	Typewriters and office machines, n.e.c.	3572, 3579
	52. Service industry machines	
52.0100	Automatic merchandising machines	3581
52.0200	Commercial laundry equipment	3582
52.0300	Refrigeration and heating equipment	3585
52.0400	Measuring and dispensing pumps	3586
52.0500	Service industry machines, n.e.c.	3589
	53. Electric industrial equipment and apparatus	
53.0100	Instruments to measure electricity	3825
53.0200	Transformers	3612
53.0300	Switchgear and switchboard apparatus	3613
53.0400	Motor and generators	3621
53.0500	Industrial controls	3622
53.0600	Welding apparatus, electric	3623
53.0700	Carbon and graphic products	3624
53.0800	Electrical industrial apparatus, n.e.c.	3629
	54. Household appliances	
54.0100	Household cooking equipment	3631
54.0200	Household refrigerator and freezers	3632
54.0300	Household laundry equipment	3633
54.0400	Electric housewares and fans	3634
54.0500	Household vacuum cleaners	3635
54.0600	Sewing machines	3636
54.0700	Household appliances, n.e.c.	3639
	55. Electric lighting and wiring equipment	
55.0100	Electric lamps	3641

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
55.0200	Lighting fixtures and equipment	3645-8
55.0300	Wiring devices	3643-4
	56. Radio, TV, and communication equipment	
56.0100	Radio and TV receiving sets	3651
56.0200	Phonograph records and tapes	3652
56.0300	Telephone and telegraph apparatus	3661
56.0400	Radio and TV communication equipment	3662
	57. Electronic components and accessories	
57.0100	Electron tubes	3671-3
57.0200	Semiconductors and related devices	3674
57.0300	Other electronic components	3675-9
	58. Miscellaneous electrical machinery and supplies	
58.0100	Storage batteries	3691
58.0200	Primary batteries, dry and wet	3692
58.0300	X-ray apparatus and tubes	3693
58.0400	Engine electrical equipment	3694
58.0500	Electrical equipment and supplies, n.e.c.	3699
	59. Motor vehicles and equipment	
59.0100	Truck and bus bodies	3713
59.0200	Truck trailers	3715
59.0301	Motor vehicles and car bodies	3711
59.0302	Motor vehicles parts and accessories	3714
	60. Aircraft and parts	
60.0100	Aircraft	3721
60.0200	Aircraft and missile engines and engine parts	3724, 3764
60.0400	Aircraft and missile equipment, n.e.c.	3728, 3769
	61. Other transportation equipment	
61.0100	Ship building and repairing	3731
61.0200	Boat bulding and repairing	3732
61.0300	Railroad equipment	374
61.0500	Motorcycles, bicycles, and parts	375

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
61.0601	Travel trailers and campers	3792
61.0602	Mobile homes	2451
61.0603	Motor homes (made from purchased materials)	3716
61.0700	Transportation equipment, n.e.c.	3799
	62. Scientific and controlling instruments	
62.0100	Engineering and scientific instruments	3811
62.0200	Mechanical measuring devices	3823-4, 3829
62.0300	Environmental controls	3822
62.0400	Surgical and medical instruments	3841
62.0500	Surgical appliances and supplies	3842
62.0600	Dental equipment and supplies	3843
62.0700	Watches, clocks, and parts	387
	63. Optical, ophthaimic, and photographic equipment	
63.0100	Optical instruments and lenses	383
63.0200	Ophthalmic goods	385
63.0300	Photographic equipment and supplies	386
	64. Miscellaneous manufacturing	
64.0101	Jewelry, precious metal	3911
64.0102	Jewelers' materials and lapidary work	3915
64.0104	Silverware and plated ware	3914
64.0105	Costume jewelry	3961
64.0200	Musical instruments	393
64.0301	Games, toys, and childrens's vehicles	3944
64.0302	Dolls	3942
64.0400	Sporting and athletic goods, n.e.c.	3949
64.0501	Pens and mechanical pencils	3951
64.0502	Lead pencils and art goods	3952
64.0503	Marking devices	3953
64.0504	Carbon paper and inked ribbons	3955
64.0600	Artificial trees and flowers	3962
64.0701	Buttons	3963
64.0702	Needles, pins, and fasteners	3964

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
64.0800	Brooms and brushes	3991
64.0900	Hard surface floor coverings	3996
64.1000	Burial caskets and vaults	3995
64.1100	Signs and advertising displays	3993
64.1200	Manufacturing industries, n.e.c.	3999 (excl. 39996)
	65. Transportation and warehousing	
65.0100	Railroads and related services	40, 474, pt. 4789
65.0200	Local and suburban transit and interurban highways passenger transportation	41
65.0300	Motor freight transportation and warehousing	42, pt. 4789
65.0400	Water transportation	44
65.0500	Air transportation	45
65.0600	Pipe lines, except natural gas	46
65.0701	Freight forwarders and other transportation services	471, 4723, pt. 478
65.0702	Arrangement of passenger transportation	4722
	66. Communications, except radio and TV	
66.0000	Communications, except radio and TV	48 (excl. 483)
	67. Radio and TV broadcasting	
67.0000	Radio and TV broadcasting	483
	68. Electric, gas, water, and sanitary services	
68.0100	Electric services (utilities)	491, pt. 493
68.0200	Gas production and distribution (utilities)	492, pt. 493
68.0301	Water supply and sewerage systems	494, 4952
68.0302	Sanitary services, steam supply, and irrigation systems	495 (excl. 4952), 496-7, pt. 493
	69. Wholesale and retail trade	
69.0100	Wholesale trade	50, 51
69.0200	Retail trade	52-7, 59, 7396, 8042
	70. Finance and insurance	
70.0100	Banking	60
70.0200	Credit agencies other than banks	61, 67 (excl. 6732)
70.0300	Security and commodity brokers	62

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
70.0400	Insurance carriers	63
70.0500	Insurance agents, brokers, and services	64
	71. Real estate and rental	
71.0100	Owner-occupied dwellings	Not applicable
71.0200	Real estate	65-6, (excl. pt. 6552), pt. 1531
	72. Hotels: personal and repair services (except auto)	
72.0100	Hotels and lodging places	70 (excl. dining)
72.0201	Laundry, cleaning, garment services, and shoe repair	721, 725
72.0202	Funeral service and crematories	726
72.0203	Portrait, photographic studios, and other miscellaneous personal services	722, 729
72.0204	Electrical repair shops	762
72.0205	Watch, clock, jewelry, and furniture repair	763-4
72.0300	Beauty and barber shops	723-4
	73. Business services	
73.0101	Miscellaneous repair shops	769
73.0102	Services to dwellings and other buildings	734
73.0103	Personnel supply services	736
73.0104	Computer and data processing services	737
73.0105	Management and consulting services, testing and research labs	7391-2, 9397
73.0106	Detective and protective services	7393
73.0107	Equipment rental and leasing services	7394
73.0108	Photofinishing labs, photocopy, and commercial photography	7332-3, 7395
73.0109	Other business services	732, 7331, 7339, 735, 7399
73.0200	Advertising	731
73.0301	Legal services	811
73.0302	Engineering, architectural, and surveying services	8911
73.0303	Accounting, auditing and bookkeeping and miscellaneous services, n.e.c.	893, 899
	74. Eating and drinking places	
74.0000	Eating and drinking places	58, pt. 70

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
	75. Automobile repair and services	
75.0001	Automotive rental and leasing, without drivers	751
75.0002	Automotive repair shops and services	753, 7549
75.0003	Automotive parking and car washes	752, 7542
	76. Amusements	
76.0100	Motion pictures	78
76.0201	Theatrical producers (except motion pictures), bands, and entertainers	792
76.0202	Bowling alleys, billiard and pool establishments	793
76.0203	Commercial sports, except racing	7941
76.0204	Racing (including track operations)	7948
76.0205	Membership sports and recreation clubs	7997
76.0206	Other amusement and recreation services	791, 799 (excl. 7997)
	77. Health, educational, and social services and nonprofit organizations	
77.0100	Doctors and dentists	801-3, 8041
77.0200	Hospitals	806
77.0301	Nursing and personal care facilities	805
77.0302	Other medical and health services, excluding nursing homes	074, 8049, 807-9
77.0401	Elementary and secondary schools	821
77.0402	Colleges, universities, and professional schools	822
77.0403	Libraries, correspondence and vocational schools, and educational services, n.e.c.	823-9
77.0501	Business associations and professional membership organizations	861-2
77.0502	Labor organizations and civic, social, and fraternal associations	863-4
77.0503	Religious organizations	866
77.0504	Other membership organizations	84, 865, 869, 8922, 6732
77.0600	Job training and related services	8331
77.0700	Child day care services	8351
77.0800	Residential care	8361
77.0900	Social services, n.e.c.	8321, 8399

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I/O No.	Sector Title	Related Census SIC Codes (1977 edition)
	78. Federal Government enterprises	
78.0100	U.S. Postal Service	4311
78.0200	Federal electric utilities	pt. 491
78.0300	Commodity Credit Corporation	pt. 613
78.0400	Other Federal Government enterprises	several
	79. State and local government enterprises	
79.0100	Local government passenger transit	pt. 41
79.0200	State and local electric utilities	pt. 491
79.0300	Other State and local government enterprises	several

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	Sector Titles	I/O Code	SIC Codes
1	Livestock & L.S. Products	1.0100	0241, pt. 0191, pt. 0259, pt. 0291
		1.0200	025 (excl. 0254 & pt. 0259), pt. 0191, pt. 0219, pt. 0291
		1.0301	021 (excl. pt. 0219), pt. 0191, pt. 0259, pt. 0291
		1.0302	027 (excl. pt. 0279), pt. 0191, pt. 0219, pt. 0259, pt. 0291
2	Other Agricultural Products	2.0100	0131, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0201	pt. 011, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0202	pt. 011, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0203	pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0300	0132, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0401	pt. 017, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0402	0173, pt. 0179, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0501	0134, 0161, pt. 0119, pt. 0139, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0502	0133, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0503	pt. 0119, pt. 0139, pt. 0101, pt. 0219, pt. 0259, pt. 0291
		2.0600	0116, pt. 0119, pt. 013, pt. 0173, pt. 0219, pt. 0259, pt. 0291
		2.0701	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
		2.0702	pt. 018, pt. 0191, pt. 0219, pt. 0259, pt. 0291
3	Foresty Products	3.0001	081-4, 097
4	Commerical Fishing	3.0002	091

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	Sector Titles	I/O Code	SIC Codes
5	Agricultural, Forestry & Fishery Services	4.0001	0254, 07 (excl. 074 & 078), 085, 092, pt. 0279
		4.0002	78
6	Iron & Ferroally Ores Mining	5.0000	101, 106
7	Nonferrous Metal Ores Mining	6.0100	102
		6.0200	103-5, pt. 108, 109
8	Coal Mining	7.0000	1111, pt. 1112, 1211, pt. 1213
9	Crude Petroleum & Natural Gas	8.0000	131, 132
10	Dimension, Crushed & Broken Stone Mining & Quarrying	9.0001	141-2
11	Other Stone & Clay Mining and Quarrying	9.0002	144
		9.0003	145
		9.0004	pt. 148, 149
12	Chemical & Fertilizer Mineral Mining	10.0000	147
13	New Petroleum Pipelines	11.0305	pt. 16-17
14	New Petroleum & Natural Gas Well Drilling	11.0601	pt. 138
15	New Petroleum, Natural Gas, & Solid Mineral Explor.	11.0602	pt. 108, pt. 1112, pt. 1213, pt. 138, pt. 148
16	Other New Construction	11.0101	pt. 15, pt. 17, pt. 6552
		11.0102	pt. 15-17
		11.0103	pt. 15-17, pt. 6552
		11.0104	pt. 15-17
		11.0105	pt. 15-17
		11.0106	pt. 15-17

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	Sector Titles	I/O Code	SIC Codes
		11.0107	pt. 15-17
		11.0201	pt. 15-17
		11.0202	pt. 15-17
		11.0203	pt. 15-17
		11.0204	pt. 15-17
		11.0205	pt. 15-17
		11.0206	pt. 15-17
		11.0207	pt. 15-17
		11.0231	pt. 15-17
		11.0232	pt. 15-17
		11.0241	pt. 15-17
		11.0250	pt. 15-17
		11.0301	pt. 16-17
		11.0302	pt. 16-17
		11.0303	pt. 16-17
		11.0304	pt. 16-17
		11.0306	pt. 16-17
		11.0307	pt. 16-17
		11.0308	pt. 16-17
		11.0400	pt. 16-17
		11.0501	pt. 15, pt. 17
		11.0502	pt. 15, pt. 17
		11.0603	pt. 108, pt. 1112, pt. 1213, pt. 148
		11.0701	pt. 15-17
		11.0702	pt. 15-17
		11.0703	pt. 15-17
		11.0704	pt. 15-17
17	Maintenance & Repair of Gas Utility Facilities	12.0207	pt. 16-17
18	Maintenance & Repair Of Petroleum Pipelines	12.0208	pt. 16-17
19	Maintenance & Repair Of Petro. & Natural Gas Wells	12.0215	pt. 138
20	Other Maintenance & Repair Construction	12.0100	pt. 15, pt. 17
		12.0201	pt. 15-17
		12.0202	pt. 1215, pt. 17

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	Sector Titles	I/O Code	SIC Codes
		12.0203	pt. 15, pt. 17
		12.0204	pt. 16-17
		12.0205	pt. 16-17
		12.0206	pt. 16-17
		12.0209	pt. 16-17
		12.0210	pt. 16-17
		12.0211	pt. 16-17
		12.0212	pt. 15-17
		12.0213	pt. 15-17
		12.0214	pt. 16-17
		12.0216	pt. 15-17
21	Ordnance & Accessories	13.0100	3761
		13.0200	3483
		13.0300	3795
		13.0500	3484
		13.0600	3482
		13.0700	3489
22	Canned & Cured Sea Food	14.0700	2091
23	Fresh & Frozen Packaged Fish	14.1200	2092
24	Other Food & Kindred Products	14.0101	2011
		14.0102	2013
		14.0103	2016
		14.0104	2017
		14.0200	2021
		14.0300	2022
		14.0400	2023
		14.0500	2024
		14.0600	2026
		14.0800	2032
		14.0900	2033
		14.1000	2034
		14.1100	2035
		14.1301	2037
		14.1302	2038
		14.1401	2041
		14.1402	2043
		14.1403	2045

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	Sector Titles	I/O Code	SIC Codes
		17.0700	2296
		17.0900	2298
		17.1001	2297
		17.1002	2299
		18.0101	2251
		18.0102	2252
		18.0201	2253
		18.0202	2254
		18.0203	2259
		18.0300	2257-8
		18.0400	231-8, 39996
		19.0100	2391
		19.0200	2392
		19.0301	2393
		19.0302	2394
		19.0303	2395
		19.0304	2396
		19.0305	2397
		19.0306	2399
27	Logging Campus & Logging Contractors	20.0100	2411
28	Sawmills & Planing Mills, Generals	20.0200	2421
29	Other Lumber & Wood Products	20.0300	2426
		20.0400	2429
		20.0501	2431
		20.0502	2434
		20.0600	2435-6
		20.0701	2439
		20.0702	2452
		20.0800	2491
		20.0901	2448
		20.0902	2492
		20.0903	2499
		21.0000	2441, 2449
30	Furniture & Fixtures	22.0101	2511
		22.0102	2519

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	Sector Titles	I/O Code	SIC Codes
		22.0103	2517
		22.0200	2512
		22.0300	2514
		22.0400	2515
		23.0100	2521
		23.0200	2522
		23.0300	2531
		23.0400	2541
		23.0500	2542
		23.0600	2591
		23.0700	2599
31	Paper & Allied Products, Except Containers	24.0100	261
		24.0200	262
		24.0300	263
		24.0400	2642
		24.0500	2647
		24.0602	266
		24.0701	2641
		24.0702	2643
		24.0703	2645
		24.0704	2646
		24.0705	2648
		24.0706	2649
32	Paperboard Containers & Boxes	25.0000	265
33	Printing & Publishing	26.0100	271
		26.0200	272
		26.0301	2731
		26.0302	2732
		26.0400	274
		26.0501	2751-2, 2754
		26.0502	2795
		26.0601	276
		26.0602	2782
		26.0700	277
		26.0801	2753
		26.0802	2789
		26.0803	2791

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	Sector Titles	I/O Code	SIC Codes
		26.0804	2793
		26.0805	2794
34	Industrial Inorganic & Organic Chemicals	27.0100	281 (excl. 28195), 2865, 2869
35	Other Chemicals & Selected Chemical Products	27.0201	2873-4
		27.0202	2875
		27.0300	2879
		27.0401	2861
		27.0402	2891
		27.0403	2892
		27.0404	2893
		27.0405	2895
		27.0406	2899
36	Plastics & Synthetic Materials	28.0100	2821
		28.0200	2822
		28.0300	2823
		28.0400	2824
37	Drugs, Cleaning & Toilet Preparations	29.0100	283
		29.0201	2841
		29.0202	2842
		29.0203	2843
		29.0300	2844
38	Paints & Allied Products	30.0000	285
39	Petroleum Refining	31.0101	291
40	Petroleum Products	31.0102	2992
		31.0103	2999
		31.0200	2951
		31.0300	2952
41	Rubber & Misc. Plastics Products	32.0100	301
		32.0200	302
		32.0301	303
		32.0302	306

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	Sector Titles	I/O Code	SIC Codes
		32.0400	307
		32.0500	304
42	Leather, Footwear & Other Leather Products	33.0001	311
		34.0100	313
		34.0201	3143-9
		34.0202	3142
		34.0301	315
		34.0302	316
		34.0303	3171
		34.0304	3172
		34.0305	319
43	Glass & Glass Products	35.0100	321, 3227, 323
		35.0200	3221
44	Ready-mix Concrete	36.1200	3273
45	Other Stone & Clay Products	36.0100	324
		36.0200	3251
		36.0300	3253
		36.0400	3255
		36.0500	3259
		36.0600	3261
		36.0701	3262
		36.0702	3263
		36.0800	3264
		36.0900	3269
		36.1000	3271
		36.1100	3272
		36.1300	3274
		36.1400	3275
		36.1500	328
		36.1600	3291
		36.1700	3292
		36.1800	3293
		36.1900	3295
		36.2000	3296
		36.2100	3297
		36.2200	3299

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	Sector Titles	I/O Code	SIC Codes
46	Blast Furnaces & Steel Mills	37.0101	3312
47	Eletrometallurgical Products	37.0102	3313
48	Steel Pipes & Tubes	37.0105	3317
49	Iron & Steel Foundaries	37.0200	332
50	Other Primary Iron & Steel Manufacturing	37.0103	3315
		37.0104	3316
		37.0300	3462
		37.0401	3398
		37.0402	3399
51	Aluminum Rolling & Drawing	38.0800	3353-5
52	Nonferrous Wire Drawing & Insulating	38.1000	3357
53	Other Primary Nonferrous Metals Manufacturing	38.0100	3331
		38.0200	3332
		38.0300	3333
		38.0400	3334, 28195
		38.0500	3339
		38.0600	334
		38.0700	3351
		38.0900	3356
		38.1100	3361
		38.1200	3362
		38.1300	3369
		38.1400	3463
54	Metal Containers	39.0100	3411
		39.0200	3412
55	Fabricated Structural Steel	40.0400	3441
56	Fabricated Plate Work (boiler shops)	40.0600	3443
57	Sheet Metal Work	40.0700	3444

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	Sector Titles	I/O Code	SIC Codes
58	Other Heating, Plumbing & Fabricated Structural Metal Products	40.0100	3431
		40.0200	3432
		40.0300	3433
		40.0500	3442
		40.0800	3446
		40.0901	3448
		40.0902	3449
59	Screw Machine Products & Bolts, Nuts, Rivets, & Washers	41.0100	345
60	Other Screw Machine Products and Stampings	41.0201	3465
		41.0202	3466
		41.0203	3469
61	Metal Coating & Allied Services	42.0402	3479
62	Misc. Fabricated Wire Products	42.0500	3495-6
63	Pipe, Valves, & Pipe Fittings	42.0800	3494, 3498
64	Other Fabricated Metal Products	42.0100	3421
		42.0201	3423
		42.0202	3425
		42.0300	3429
		42.0401	3471
		42.0700	3493
		42.1000	3497
		42.1100	3499
65	Engines & Turbines	43.0100	3511
		43.0200	3519
66	Farm & Garden Machinery	44.0001	3523
		44.0002	3524
67	Oil Field Machinery	45.0300	3533
68	Construction & Mining Machinery, Except Oil Field Machinery	45.0100	3531
		45.0200	3532

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MMS I/O SECTOR DIRECTORY

	Sector Titles	I/O Code	SIC Codes
69	Materials Handling Machinery & Equipment	46.0100	3534
		46.0200	3535
		46.0300	3536
		46.0400	3537
70	Metalworking Machinery & Equipment	47.0100	3541
		47.0200	3542
		47.0300	3544-5
		47.0401	3546
		47.0402	3547
		47.0403	3549
71	Special Industry Machinery & Equipment	48.0100	3551
		48.0200	3552
		48.0300	3553
		48.0400	3554
		48.0500	3555
		48.0600	3559
72	General Industrial Machinery & Equipment	49.0100	3561, 3563
		49.0200	3562
		49.0300	3564
		49.0400	3565
		49.0500	3566, 3568
		49.0600	3567
		49.0700	3569
73	Misc. Machinery, Except Electrical	50.0001	3592
		50.0002	3599
74	Office, Computing, & Accounting Machines	51.0101	3573
		51.0102	3574
		51.0300	3576
		51.0400	3572, 3579
75	Service Industry Machines	52.0100	3581
		52.0200	3582
		52.0300	3585
		52.0400	3586
		52.0500	3589

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	Sector Titles	I/O Code	SIC Codes
76	Electrical Industrial Equipment & Apparatus	53.0100	3825
		53.0200	3612
		53.0300	3613
		53.0400	3621
		53.0500	3622
		53.0600	3623
		53.0700	3624
		53.0800	3629
77	Household Appliances	54.0100	3631
		54.0200	3632
		54.0300	3633
		54.0400	3634
		54.0500	3635
		54.0600	3636
		54.0700	3639
78	Electric Lighting & Wiring Equipment	55.0100	3641
		55.0200	3645-8
		55.0300	3643-4
79	Radio, TV, & Communication Equipment	56.0100	3651
		56.0200	3652
		56.0300	3661
		56.0400	3662
80	Electronic Components & Accessories	57.0100	3671-3
		57.0200	3674
		57.0300	3675-9
81	Misc. Electrical Machinery & Supplies	58.0100	3691
		58.0200	3692
		58.0300	3693
		58.0400	3694
		58.0500	3699
82	Shipbuilding & Repairing	61.0100	3731
83	Other Transportation Equipment	59.0100	3713
		59.0200	3715

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MMS I/O SECTOR DIRECTORY

	Sector Titles	I/O Code	SIC Codes
		59.0301	3711
		59.0302	3714
		60.0100	3721
		60.0200	3724, 3764
		60.0400	3728, 3769
		61.0200	3732
		61.0300	374
		61.0500	375
		61.0601	3792
		61.0602	2451
		61.0603	3716
		61.0700	3799
84	Scientific, Photographic & Medical Equipment	62.0100	3811
		62.0200	3823-4, 3829
		62.0300	3822
		62.0400	3841
		62.0500	3842
		62.0600	3843
		62.0700	387
		63.0100	383
		63.0200	385
		63.0300	386
85	Misc. Manufacturing	64.0101	3911
		64.0102	3915
		64.0104	3914
		64.0105	3961
		64.0200	393
		64.0301	3944
		64.0302	3942
		64.0400	3949
		64.0501	3951
		64.0502	3952
		64.0503	3953
		64.0504	3955
		64.0600	3962
		64.0701	3963
		64.0702	3964
		64.0800	3991
		64.0900	3996

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	Sector Titles	I/O Code	SIC Codes
		64.1000	3995
		64.1100	3993
		64.1200	3999 (excl. 39996)
86	Railroads & Related Services	65.0100	40, 474, pt. 4789
87	Motor Freight Transportation & Warehousing	65.0300	42, pt. 4789
88	Water Transportation	65.0400	44
89	Pipe Lines, Except Natural Gas	65.0600	46
90	Other Transportation & Warehousing	65.0200	41
		65.0500	45
		65.0701	471, 4723, pt. 478
		65.0702	4722
91	Communications, Except Radio & TV	66.0000	48 (excl. 483)
92	Radio & TV Broadcasting	67.0000	483
93	Electric Services (Utilities)	68.0100	491, pt. 493
94	Gas Production & Distribution (Utilities)	68.0200	492, pt. 493
95	Gas, Water, & Sanitary Services	68.0301	494, 4952
		68.0302	495 (excl. 4952), 496-7, pt. 493
96	Wholesale Trade	69.0100	50, 51
97	Retail Trade	69.0200	52-7, 59, 7396, 8042
98	Banking	70.0100	60
99	Insurance Carriers	70.0400	63
100	Other Finance & Insurance	70.0200	61, 67 (excl. 6732)

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MMS I/O SECTOR DIRECTORY

	Sector Titles	I/O Code	SIC Codes
		70.0300	62
		70.0500	64
101	Real Estate & Rental	71.0100	Not applicable
		71.0200	65-6 (excl. pt. 6552), pt. 1531
102	Hotels & Lodging Places	72.0100	70 (excl. dining)
103	Personal & Repair Services (Except Auto)	72.0201	721, 725
		72.0202	726
		72.0203	722, 729
		72.0204	762
		72.0205	763-4
		72.0300	723-4
104	Misc. Repair Shops	73.0101	769
105	Computer & Data Processing Services	73.0104	737
106	Management, Consulting, Testing, & Research Lab Services	73.0105	7391-2, 7397
107	Equipment Rental & Leasing Services	73.0107	7394
108	Advertising	73.0200	731
109	Legal Services	73.0301	811
110	Accounting, Auditing & Book-keeping & Misc. Services	73.0303	893, 899
111	Other Business Services	73.0102	734
		73.0103	736
		73.0106	7393
		73.0108	7332-3, 7395
		73.0109	732, 7331, 7339, 735, 7399
		73.0302	8911

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MMS I/O SECTOR DIRECTORY

	Sector Titles	I/O Code	SIC Codes
112	Eating & Drinking Places	74.0000	58, pt. 70
113	Automotive Repair & Services	75.0001	751
		75.0002	753, 7549
		75.0003	752, 7542
114	Amusements	76.0100	78
		76.0201	792
		76.0202	793
		76.0203	7941
		76.0204	7948
		76.0205	7997
		76.0206	791, 799 (excl. 7997)
115	Health, Educational, & Social Services & Nonprofit Org.	77.0100	801-3, 8041
		77.0200	806
		77.0301	805
		77.0302	074, 8049, 807-9
		77.0401	821
		77.0402	822
		77.0403	823-9
		77.0501	861-2
		77.0502	863-4
		77.0503	866
		77.0504	84, 865, 869, 8922, 6732
		77.0600	8331
		77.0700	8351
		77.0800	8361
		77.0900	8321, 8399
116	Other Industry	78.0100	4311
		78.0200	pt. 491
		78.0300	pt. 613
		78.0400	several
		79.0100	pt. 41
		79.0200	pt. 491
		79.0300	several
		81.0001	
		81.0002	
		82.0000	
		83.0000	

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MMS I/O SECTOR DIRECTORY

	Sector Titles	I/O Code	SIC Codes
112	Eating & Drinking Places	74.0000	58, pt. 70
113	Automotive Repair & Services	75.0001	751
		75.0002	753, 7549
		75.0003	752, 7542
114	Amusements	76.0100	78
		76.0201	792
		76.0202	793
		76.0203	7941
		76.0204	7948
		76.0205	7997
		76.0206	791, 799 (excl. 7997)
115	Health, Educational, & Social Services & Nonprofit Org.	77.0100	801-3, 8041
		77.0200	806
		77.0301	805
		77.0302	074, 8049, 807-9
		77.0401	821
		77.0402	822
		77.0403	823-9
		77.0501	861-2
		77.0502	863-4
		77.0503	866
		77.0504	84, 865, 869, 8922, 6732
		77.0600	8331
		77.0700	8351
		77.0800	8361
		77.0900	8321, 8399
116	Other Industry	78.0100	4311
		78.0200	pt. 491
		78.0300	pt. 613
		78.0400	several
		79.0100	pt. 41
		79.0200	pt. 491
		79.0300	several
		81.0001	
		81.0002	
		82.0000	
		83.0000	
		84.0000	

APPENDIX D

APPENDIX D

PRICE INDEX DIRECTORY

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
10100	PPI 016	278.3	202.8	1.37
10200	PPI (014 + 017)/2	225.7	168.7	1.34
10301	PPI 013	251.8	173.0	1.46
10302	PPI 013	251.8	173.0	1.46
20100	PPI 0151	234.7	209.1	1.12
20201	PPI 012	239.7	165.0	1.45
20202	PPI 012	239.7	165.0	1.45
20203	PPI 0182	253.4	269.9	0.94
20300	PPI 0192	274.6	176.1	1.56
20401	PPI 0111	253.0	177.5	1.43
20402	PPI 019	285.6	325.9	0.88
20501	PPI 0113	278.3	187.1	1.49
20502	PPI 02510101	312.0	149.5	2.09
20503	PPI 012	239.7	165.0	1.45
20600	PPI 0183	253.3	236.7	1.07
20701	PPI 08	307.4	236.3	1.30
20702	PPI 019	285.6	325.9	0.88
30001	PPI 08	307.4	236.3	1.30
30002	PPI 022301	539.7	374.4	1.44
40001	PPI 022301	539.7	374.4	1.44
40002	PPI 022301	539.7	374.4	1.44
50000	PPI 1011	282.1	186.1	1.52
60100	PPI 102	277.1	195.4	1.42
60200	PPI 102	277.1	195.4	1.42
70000	PPI 051	546.3	389.4	1.40
80000	PPI (053 + 0561)/2	889.0	331.0	2.69
90001	PPI 1321	295.2	170.7	1.73
90002	PPI 13210101	315.4	~~295.2~~	~~170.7~~ 1.73
90003	PPI 1321	295.2	170.7	1.73
90004	PPI 1321	295.2	170.7	1.73
100000	PPI 0652	236.5	187.8	1.26
110101	E.H. Boeckh (sm. res. struct.)	165.1	88.2	1.87
110102	E.H. Boeckh (sm. res. struct.)	165.1	88.2	1.87
110103	E.H. Boeckh (com. fact. bldg.)	166.8	99.5	1.68
110104	E.H. Boeckh (com. fact. bldg.)	166.8	99.5	1.68
110105	E.H. Boeckh (com. fact. bldg.)	166.8	99.5	1.68
110106	E.H. Boeckh (com. fact. bldg.)	166.8	99.5	1.68
110107	E.H. Boeckh (com. fact. bldg.)	166.8	99.5	1.68
110201	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110202	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68

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PRICE INDEX DIRECTORY
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I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
110203	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110204	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110205	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110206	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110207	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110231	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110232	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110241	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110250	E.H. Boeckh (apt. hot. off. bldg.)	166.8	99.5	1.68
110301	Handy-Whitman Pub. Utility (elec.)	154.0	100.0	1.54
110302	Federal Highway Administration	155.0	106.4	1.46
110303	Handy-Whitman Pub. Utility (elec.)	154.0	100.0	1.54
110304	Fed. Energy Reg. Comm. (pipeline)	151.0	95.5	1.58
110305	Fed. Energy Reg. Comm. (pipeline)	151.0	95.5	1.58
110306	Fed. Energy Reg. Comm. (pipeline)	151.0	95.5	1.58
110307	Environmental Protection Agency	179.5	101.9	1.76
110308	Fed. Highway Admin. (highways)	155.0	106.4	1.46
110400	Fed. Highway Admin. (highways)	155.0	106.4	1.46
110501	E.H. Boeckh (sm. resid. struct.)	165.1	100.4	1.64
110502	E.H. Boeckh (sm. resid. struct.)	165.1	100.4	1.64
110601	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
110602	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
110603	E.H. Boeckh (comm. & fac. bldg.)	166.2	100.1	1.66
110701	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
110702	Fed. Highway Admin. (highways)	155.0	106.4	1.46
110703	Fed. Highway Admin. (highways)	155.0	106.4	1.46
110704	Fed. Highway Admin. (highways)	155.0	106.4	1.46
120100	E.H. Boeckh (sm. resid. struct.)	165.1	100.4	1.64
120201	E.H. Boeckh (apt. hot. & off. bldg.)	166.8	99.5	1.68
120202	E.H. Boeckh (sm. resid. struct.)	165.1	100.4	1.64
120203	E.H. Boeckh (apt. hot. & off. bldg.)	166.8	99.5	1.68
120204	Handy-Whitman Pub. Utility (elec.)	154.0	100.0	1.54
120205	Fed. Highway Admin. (highways)	155.0	106.4	1.46
120206	Handy-Whitman Pub. Utility (elec.)	154.0	100.0	1.54
120207	Fed. Energy Reg. Comm. (pipeline)	151.0	104.0	1.45
120208	Fed. Energy Reg. Comm. (pipeline)	151.0	104.0	1.45
120209	Fed. Energy Reg. Comm. (pipeline)	151.0	104.0	1.45
120210	EPA (sewage treatment plant)	179.5	101.9	1.76
120211	Fed. Highway Adm. (highways)	155.0	106.4	1.46

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I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
120212	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
120213	Fed. Highway Adm. (highways)	155.0	106.4	1.46
120214	Fed. Highway Adm. (highways)	155.0	106.4	1.46
120215	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
120216	Engineering News-Rec. (gen. const.)	161.0	100.4	1.60
130100	PPI 14	262.7	161.3	1.63
130200	PPI 14	262.7	161.3	1.63
130300	PPI 14	262.7	161.3	1.63
130500	PPI 14	262.7	161.3	1.63
130600	PPI 14	262.7	161.3	1.63
130700	PPI 14	262.7	161.3	1.63
140101	PPI 0221	236.8	170.7	1.39
140102	PPI 022104	226.5	190.1	1.19
140103	PPI 0222	206.0	173.3	1.19
140104	PPI 0222	206.0	173.3	1.19
140200	PPI 0232	228.8	148.0	1.55
140300	PPI 0233	311.6	215.3	1.45
140400	PPI 0235	409.7	287.5	1.43
140500	PPI 0234	246.3	157.4	1.56
140600	PPI 0231	201.1	141.3	1.42
140700	PPI 022304	322.3	247.6	1.30
140800	PPI (0284 + 0285)/2	256.8	163.6	1.57
140900	PPI (0241 + 0244)/2	282.5	181.1	1.56
141000	PPI 0243	386.6	292.5	1.32
141100	PPI (0282 + 0289)/2	283.3	203.7	1.39
141200	PPI 0223	476.0	294.3	1.62
141301	PPI (0245 + 0242)/2	321.0	194.3	1.65
141302	PPI 0285	264.3	156.0	1.69
141401	PPI 0212	205.4	135.3	1.52
141402	PPI 021	270.5	173.4	1.56
141403	PPI 0212	205.4	135.3	1.52
141501	PPI 029	220.3	204.6	1.08
141502	PPI 0291	194.6	191.5	1.02
141600	PPI 0213	195.9	171.0	1.15
141700	PPI 0214	296.9	186.8	1.59
141801	PPI 0211	299.1	186.5	1.60
141802	PPI 0211	299.1	186.5	1.60
141900	PPI 025	301.2	177.4	1.70
142001	PPI 025	301.2	177.4	1.70

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I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
142002	PPI 025	301.2	177.4	1.70
142003	PPI 025	301.2	177.4	1.70
142101	PPI 026101	210.4	141.7	1.48
142102	PPI 02640101	240.3	210.3	1.14
142103	PPI 0261	209.8	139.7	1.50
142104	PPI 026102	186.9	134.6	1.39
142200	PPI 0262	340.2	198.1	1.72
142300	PPI 02640103	209.4	210.3	1.00
142400	PPI 02720111	183.9	136.6	1.35
142500	PPI 02720101	268.3	216.9	1.24
142600	PPI 0272	262.2	197.5	1.33
142700	PPI 0274	311.6	198.1	1.57
142800	PPI 026301	357.4	441.7	0.81
142900	PPI 0274	311.6	198.1	1.57
143000	PPI 02	265.0	186.1	1.42
143100	PPI 02140104	261.6	168.0	1.56
143200	PPI 02	265.0	186.1	1.42
150101	PPI 1521	425.0	184.8	2.30
150102	PPI 1522	183.8	130.6	1.41
150103	PPI 1523	399.3	200.1	2.00
150200	PPI 1523	399.3	200.1	2.00
160100	PPI 0337	154.0	104.6	1.47
160200	PPI 0338	148.3	107.4	1.38
160300	PPI 0326	139.7	99.9	1.40
160400	PPI 0327	178.3	112.5	1.58
170100	PPI 123	191.2	136.4	1.40
170200	PPI 123	191.2	136.4	1.40
170300	PPI 123	191.2	136.4	1.40
170400	PPI 123	191.2	136.4	1.40
170500	PPI 123	191.2	136.4	1.40
170600	PPI 123	191.2	136.4	1.40
170700	PPI 123	191.2	136.4	1.40
170900	PPI 123	191.2	136.4	1.40
171001	PPI 123	191.2	136.4	1.40
171002	PPI 123	191.2	136.4	1.40
180101	PPI 0382	238.9	171.3	1.39
180102	PPI 0382	238.9	171.3	1.39
180201	PPI 0382	238.9	171.3	1.39
180202	PPI 0382	238.9	171.3	1.39

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PRICE INDEX DIRECTORY
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I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
180203	PPI 0382	238.9	171.3	1.39
180300	PPI 0382	238.9	171.3	1.39
180400	PPI 0382	238.9	171.3	1.39
190100	PPI 0383	135.4	100.0	1.35
190200	PPI 0383	135.4	100.0	1.35
190301	PPI 0383	135.4	100.0	1.35
190302	PPI 0383	135.4	100.0	1.35
190303	PPI 0383	135.4	100.0	1.35
190304	PPI 0383	135.4	100.0	1.35
190305	PPI 0383	135.4	100.0	1.35
190306	PPI 0383	135.4	100.0	1.35
200100	PPI 081	349.8	276.5	1.27
200200	PPI 081	349.8	276.5	1.27
200300	PPI 0812	319.7	200.3	1.60
200400	PPI 0812	319.7	200.3	1.60
200501	PPI 082	307.8	193.7	1.59
200502	PPI 08210101	217.8	146.2	1.49
200600	PPI 083	241.6	212.2	1.14
200701	PPI 0811	353.9	297.4	1.19
200702	PPI 0822	258.6	140.0	1.85
200800	PPI 08	307.4	236.3	1.30
200901	PPI 0841	202.6	148.3	1.37
200902	PPI 0822	258.6	176.1	1.47
200903	PPI 082	307.8	193.7	1.59
210000	PPI 0842	266.1	196.5	1.35
220101	PPI 1212	272.5	169.0	1.61
220102	PPI 121	242.1	162.2	1.49
220103	PPI 121	242.1	162.2	1.49
220200	PPI 1212	272.5	169.0	1.61
220300	PPI 1211	210.1	159.8	1.31
220400	PPI 121203	267.9	170.0	1.58
230100	PPI 1221	295.6	179.4	1.65
230200	PPI 1222	299.8	191.3	1.57
230300	PPI 122	297.1	185.9	1.60
230400	PPI 1221	295.6	197.4	1.50
230500	PPI 1222	299.8	191.3	1.57
230600	PPI 122	297.1	185.9	1.60
230700	PPI 122	297.1	185.9	1.60
240100	PPI 09	318.5	186.4	1.71

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
240200	PPI 09	318.5	186.4	1.71
240300	PPI 0914	281.5	176.2	1.60
240400	PPI 0913	302.9	194.3	1.56
240500	PPI 0915	281.2	176.6	1.59
240602	PPI 092	259.0	157.0	1.65
240701	PPI 0915	281.2	176.6	1.59
240702	PPI 0915	281.2	176.6	1.59
240703	PPI 0913	302.9	194.3	1.56
240704	PPI 092	259.0	157.0	1.65
240705	PPI 0913	302.9	194.3	1.56
240706	PPI 0915	281.2	176.6	1.59
250000	PPI 0914	281.5	176.2	1.60
260100	PPI 09130291	323.1	216.5	1.49
260200	PPI 09130291	323.1	216.5	1.49
260301	PPI 09130291	323.1	216.5	1.49
260302	PPI 09130291	323.1	216.5	1.49
260400	PPI 09130291	323.1	216.5	1.49
260501	PPI 09130291	323.1	216.5	1.49
260502	PPI 09130291	323.1	216.5	1.49
260601	PPI 09130291	323.1	216.5	1.49
260602	PPI 09130291	323.1	216.5	1.49
260700	PPI 09130291	323.1	216.5	1.49
260801	PPI 09130291	323.1	216.5	1.49
260802	PPI 09130291	323.1	216.5	1.49
260803	PPI 09130291	323.1	216.5	1.49
260804	PPI 09130291	323.1	216.5	1.49
260805	PPI 09130291	323.1	216.5	1.49
270100	PPI 0613	292.5	189.5	1.54
270201	PPI 0652	236.5	160.4	1.47
270202	PPI 0651	266.6	173.8	1.53
270300	PPI 65	284.8	187.8	1.52
270401	PPI 0622	329.7	205.9	1.60
270402	PPI 066	308.6	197.5	1.56
270403	PPI 067902	309.7	194.0	1.60
270404	PPI 067	277.5	176.7	1.57
270405	PPI 067	277.5	176.7	1.57
270406	PPI 067	277.5	176.7	1.57
280100	PPI 07	246.8	167.6	1.47
280200	PPI 071102	286.9	166.2	1.73

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
280300	PPI 03	210.0	154.0	1.36
280400	PPI 031502	171.0	113.5	1.51
290100	PPI 063	240.0	140.5	1.71
290201	PPI 0671	267.0	168.4	1.59
290202	PPI 0671	267.0	168.4	1.59
290203	PPI 0671	267.0	168.4	1.59
290300	PPI 0675	237.4	141.1	1.68
300000	PPI 062	295.3	182.4	1.62
310101	PPI 057	665.1	308.2	2.16
310102	PPI 0576	369.5	188.8	1.96
310103	PPI 057	665.1	308.2	2.16
310200	PPI 0574	1119.6	522.5	2.14
310300	PPI 0574	1119.6	522.5	2.14
320100	PPI (0711 + 0722)/2	252.3	166.0	1.52
320200	PPI 071301	227.4	177.8	1.28
320301	PPI 0713	290.6	176.8	1.64
320302	PPI 0713	290.6	176.8	1.64
320400	PPI 0713	290.6	176.8	1.64
320500	PPI 071303	347.4	202.5	1.72
330001	PPI 042	372.3	201.0	1.85
340100	PPI 043	251.7	168.7	1.49
340201	PPI 043	251.7	168.7	1.49
340202	PPI 043	251.7	168.7	1.49
340301	PPI 0442	320.6	202.9	1.58
340302	PPI 0441	212.8	139.9	1.52
340303	PPI 0441	212.8	139.9	1.52
340304	PPI 044	263.6	163.4	1.61
340305	PPI 044	263.6	163.4	1.61
350100	PPI 131	233.8	160.8	1.45
350200	PPI 138	360.7	214.2	1.68
360100	PPI 1322	269.3	228.6	1.18
360200	PPI 1331	292.2	183.6	1.59
360300	PPI 1344	223.1	158.8	1.40
360400	PPI 1352	232.9	126.6	1.84
360500	PPI 134	286.8	204.0	1.41
360600	PPI 1051	340.7	214.6	1.59
360701	PPI 1052	293.8	174.2	1.69
360702	PPI 135	361.2	199.5	1.81
360800	PPI 135	361.2	199.5	1.81

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
360900	PPI 135	361.2	199.5	1.81
361000	PPI 1331	297.2	183.6	1.62
361100	PPi 133	309.6	191.8	1.61
361200	PPI 1333	318.9	196.6	1.62
361300	PPI 1391	364.8	220.1	1.66
361400	PPI 137	346.7	183.5	1.89
361500	PPI 1136	306.7	193.4	1.59
361600	PPI 13	337.3	200.5	1.68
361700	PPI 1392	370.7	235.9	1.57
361800	PPI 13	337.3	200.5	1.68
361900	PPI 1392	370.7	232.9	1.59
362000	PPI 13	337.3	200.5	1.68
362100	PPI 13	337.3	200.5	1.68
362200	PPI 13	337.3	200.5	1.68
370101	PPI 1016	308.2	257.1	1.20
370102	PPI 1016	308.2	257.1	1.20
370103	PPI 1026	202.3	156.1	1.30
370104	PPI 10	316.1	209.9	1.51
370105	PPI 1074	300.5	208.2	1.44
370200	PPI 1015	360.6	230.5	1.56
370300	PPI 1015	360.6	230.5	1.56
370401	PPI 1015	360.6	230.5	1.56
370402	PPI 101	356.9	230.4	1.55
380100	PPI 102	277.1	195.4	1.42
380200	PPI 102	277.1	195.4	1.42
380300	PPI 102	277.1	195.4	1.42
380400	PPI 102	277.1	195.4	1.42
380500	PPI 102	277.1	195.4	1.42
380600	PPI 102	277.1	195.4	1.42
380700	PPI 102	277.1	195.4	1.42
380800	PPI 102	277.1	195.4	1.42
380900	PPI 102	277.1	195.4	1.42
381000	PPI 102	277.1	195.4	1.42
381100	PPI 102	277.1	195.4	1.42
381200	PPI 102	277.1	195.4	1.42
381300	PPI 102	277.1	195.4	1.42
381400	PPI 102	277.1	195.4	1.42
390100	PPI 1031	354.2	219.6	1.61
390200	PPI 1032	326.4	211.4	1.54

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
400100	PPI 105	302.7	186.6	1.62
400200	PPI 105	302.7	186.6	1.62
400300	PPI 106	252.9	165.5	1.53
400400	PPI 107	310.7	206.7	1.50
400500	PPI 1071	309.6	188.7	1.64
400600	PPI 107	310.7	206.7	1.50
400700	PPI 1073	325.4	218.9	1.49
400800	PPI 1074	300.5	208.2	1.44
400901	PPI 1074	300.5	208.2	1.44
400902	PPI 1074	300.5	208.2	1.44
410100	PPI 1081	275.7	200.7	1.37
410201	PPI 1089	303.3	200.5	1.51
410202	PPI 1089	303.3	200.5	1.51
410203	PPI 1089	303.3	200.5	1.51
420100	PPI 108	295.3	196.2	1.51
420201	PPI 108	295.3	196.2	1.51
420202	PPI 108	295.3	196.2	1.51
420300	PPI 108	295.3	196.2	1.51
420401	PPI 108	295.3	196.2	1.51
420402	PPI 108	295.3	196.2	1.51
420500	PPI 108	295.3	196.2	1.51
420700	PPI 108	295.3	196.2	1.51
420800	PPI 108	295.3	196.2	1.51
421000	PPI 108	295.3	196.2	1.51
421100	PPI 108	295.3	196.2	1.51
430100	PPI 1194	338.1	196.4	1.72
430200	PPI 1194	338.1	196.4	1.72
440001	PPI 111	336.1	197.9	1.70
440002	PPI 111105	308.9	189.9	1.63
450100	PPI 112	357.0	213.5	1.67
450200	PPI 1192	374.8	228.6	1.64
450300	PPI 1191	425.0	236.6	1.80
460100	PPI 1142	266.4	191.1	1.39
460200	PPI 114402	244.2	157.7	1.55
460300	PPI 114404	285.8	187.9	1.52
460400	PPI 1411	237.8	155.7	1.53
470100	PPI 1137	385.7	206.3	1.87
470200	PPI 1138	423.7	232.6	1.82

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
470300	PPI 1138	423.7	232.6	1.82
470401	PPI 1132	223.7	152.0	1.47
470402	PPI 113	334.0	198.5	1.68
470403	PPI 113	334.0	198.5	1.68
480100	PPI 1161	320.1	194.3	1.65
480200	PPI 1162	267.2	177.6	1.50
480300	PPI 1163	294.4	182.4	1.61
480400	PPI 1167	184.0	103.1	1.78
480500	PPI 1165	316.7	197.4	1.60
480600	PPI 1166	435.1	233.0	1.87
490100	PPI 1141	349.5	201.8	1.73
490200	PPI 114905	341.2	191.4	1.78
490300	PPI 1147	347.7	229.4	1.52
490400	PPI 113	334.0	198.5	1.68
490500	PPI 1145	326.1	196.6	1.66
490600	PPI 1134	374.8	216.8	1.73
490700	PPI 113	334.0	198.5	1.68
500001	PPI 119501	423.7	259.0	1.64
500002	PPI 119	274.4	180.7	1.52
510101	PPI 1178	193.2	119.5	1.62
510102	PPI 119301	85.5	95.6	0.89
510300	PPI 1146	231.1	166.2	1.39
510400	PPI 1193	154.0	122.8	1.25
520100	PPI 1193	159.0	122.8	1.29
520200	PPI 1167	348.7	202.7	1.72
520300	PPI 1148	144.3	100.0	1.44
520400	PPI 1141	349.5	211.6	1.65
520500	PPI 114	314.1	201.8	1.56
530100	PPI 1172	228.7	152.6	1.50
530200	PPI 1174	227.4	146.5	1.55
530300	PPI 1175	227.0	173.5	1.31
530400	PPI 1173	340.0	202.2	1.68
530500	PPI 117	248.7	154.1	1.61
530600	PPI 1174	227.4	119.5	1.90
530700	PPI 117903	374.7	217.7	1.72
530800	PPI 117	248.7	154.1	1.61
540100	PPI 124101	232.6	159.5	1.46
40200	PPI 124103	207.6	147.3	1.41
540300	PPI 124102	218.6	150.7	1.45

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
540400	PPI 1244	185.9	127.2	1.46
540500	PPI 1243	166.4	124.6	1.34
540600	PPI 124	211.0	145.1	1.45
540700	PPI 124	211.0	145.1	1.45
550100	PPI 1177	337.7	191.3	1.77
550200	PPI 1177	337.7	191.3	1.77
550300	PPI 1171	353.6	200.1	1.77
560100	PPI (1251 + 1252)/2	84.3	90.3	0.93
560200	PPI 1253	97.7	86.4	1.13
560300	PPI (1251 + 1252)/2	84.3	90.3	0.93
560400	PPI (1251 + 1252)/2	84.3	90.3	0.93
570100	PPI 1178	193.2	119.5	1.62
570200	PPI 1178	193.2	119.5	1.62
570300	PPI 1178	193.2	119.5	1.62
580100	PPI 117901	200.6	162.7	1.23
580200	PPI 117902	214.9	161.4	1.33
580300	PPI 117905	350.6	164.6	2.13
580400	PPI 117906	297.8	193.2	1.54
580500	PPI 1179	272.1	185.1	1.47
590100	PPI 1412	353.3	195.6	1.81
590200	PPI 1412	353.3	195.6	1.81
590301	PPI 1411	237.8	155.7	1.53
590302	PPI 1412	353.3	195.6	1.81
600100	PPI 142	354.1	182.8	1.94
600200	PPI 142	354.1	182.8	1.94
600400	PPI 142	354.1	182.8	1.94
610100	PPI 14	262.7	161.3	1.63
610200	PPI 14	267.7	161.3	1.66
610300	PPI 144	355.5	233.5	1.52
610500	PPI 14	262.7	161.3	1.63
610601	PPI 155	163.3	116.8	1.40
610602	PPI 155	163.3	116.8	1.40
610603	PPI 155	163.3	116.8	1.40
610700	PPI 14	262.7	161.3	1.63
620100	PPI 117	248.7	154.1	1.61
620200	PPI 117	248.7	154.1	1.61
620300	PPI 117	248.7	154.1	1.61
620400	PPI 117	248.7	154.1	1.61
620500	PPI 117	248.7	154.1	1.61

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
620600	PPI 117	248.7	154.1	1.61
620700	PPI 117	248.7	154.1	1.61
630100	PPI 154	214.6	139.9	1.53
630200	PPI 154	214.6	139.9	1.53
630300	PPI 154	214.6	139.9	1.53
640101	Total PPI	310.3	194.2	1.60
640102	Total PPI	210.3	194.2	1.08
640104	Total PPI	310.3	194.2	1.60
640105	Total PPI	310.3	194.2	1.60
640200	Total PPI	310.3	194.2	1.60
640301	Total PPI	310.3	194.2	1.60
640302	Total PPI	310.3	194.2	1.60
640400	Total PPI	310.3	194.2	1.60
640501	Total PPI	310.3	194.2	1.60
640502	Total PPI	310.3	194.2	1.60
640503	Total PPI	310.3	194.2	1.60
640504	Total PPI	310.3	194.2	1.60
640600	Total PPI	310.3	194.2	1.60
640701	Total PPI	310.3	194.2	1.60
640702	Total PPI	310.3	194.2	1.60
640800	Total PPI	310.3	194.2	1.60
640900	Total PPI	310.3	194.2	1.60
641000	Total PPI	310.3	194.2	1.60
641100	Total PPI	310.3	194.2	1.60
641200	Total PPI	310.3	194.2	1.60
650100	CPI (public transpt.)	385.2	182.4	2.11
650200	CPI Public Transpt. (intracity)	344.6	176.5	1.95
650300	CPI (public transpt.)	385.2	182.4	2.11
650400	CPI (public transpt.)	385.2	182.4	2.11
650500	CPI Public Transpt. (airline fares)	443.0	182.0	2.43
650600	CPI (public transpt.)	385.2	182.4	2.11
650701	CPI (public transpt.)	385.2	182.4	2.11
650702	CPI (public transpt.)	385.2	182.4	2.11
660000	CPI (entertainment)	255.1	167.7	1.52
670000	CPI (entertainment)	255.1	167.7	1.52
680100	PPI 054 (electric power)	439.4	232.9	1.89
680200	PPI 053	1109.0	387.8	2.86
680301	EPA (sewage treatment plant)	179.5	101.9	1.76
680302	EPA (sewage treatment plant)	179.5	101.9	1.76

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
690100	Total PPI	310.3	194.2	1.60
690200	Total CPI	311.1	181.5	1.71
700100	CPI (other services)	296.0	172.5	1.72
700200	CPI (other services)	296.0	172.5	1.72
700300	CPI (other services)	296.0	172.5	1.72
700400	CPI (other services)	296.0	172.5	1.72
700500	CPI (other services)	296.0	172.5	1.72
710100	CPI (housing)	336.5	186.5	1.80
710200	CPI Housing (rent)	249.3	153.5	1.62
720100	CPI (other services)	296.0	172.5	1.72
720201	CPI (household services)	506.1	212.4	2.38
720202	CPI (other services)	296.0	172.5	1.72
720203	CPI (other services)	296.0	172.5	1.72
720204	CPI Housing (furnishings, etc.)	242.5	167.5	1.45
720205	CPI (other services)	296.0	172.5	1.72
720300	CPI (personal care services)	274.1	174.4	1.57
730101	CPI (other services)	296.0	172.5	1.72
730102	CPI Housing (maintenance & repair)	359.2	214.7	1.67
730103	CPI (personal care services)	271.4	170.9	1.59
730104	CPI (other services)	296.0	172.5	1.72
730105	CPI (personal & educational exp.)	365.7	184.1	1.99
730106	CPI (personal & educational exp.)	365.7	184.1	1.99
730107	CPI (all services)	363.0	194.3	1.87
730108	CPI (other services)	296.0	172.5	1.72
730109	CPI (other services)	296.0	172.5	1.72
730200	CPI (other services)	296.0	172.5	1.72
730301	CPI (other services)	296.0	172.5	1.72
730302	CPI (other services)	296.0	172.5	1.72
730303	CPI (other services)	296.0	172.5	1.72
740000	CPI Food (away from home)	334.3	200.3	1.67
750001	CPI Transportation (private)	306.6	176.6	1.74
750002	CPI Transportation (private)	306.6	176.6	1.74
750003	CPI Transportation (private)	306.6	176.6	1.74
760100	CPI (entertainment)	255.1	167.7	1.52
760201	CPI (entertainment)	255.1	167.7	1.52
760202	CPI (entertainment)	255.1	167.7	1.52
760203	CPI (entertainment)	255.1	167.7	1.52
760204	CPI (entertainment)	255.1	167.7	1.52
760205	CPI (entertainment)	255.1	167.7	1.52

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
760206	CPI (entertainment)	255.1	167.7	1.52
770100	CPI (physicians' services)	376.8	206.0	1.83
770200	CPI (hospital room)	670.9	299.5	2.24
770301	CPI (medical care)	379.5	202.4	1.88
770302	CPI Medical Care (all services)	410.3	216.7	1.89
770401	CPI (personal & educational exp.)	365.7	184.1	1.99
770402	CPI (personal & educational exp.)	365.7	184.1	1.99
770403	CPI (personal & educational exp.)	365.7	184.1	1.99
770501	CPI (personal & educational exp.)	365.7	184.1	1.99
770502	CPI (personal & educational exp.)	365.7	184.1	1.99
770503	CPI (personal & educational exp.)	365.7	184.1	1.99
770504	CPI (personal & educational exp.)	365.7	184.1	1.99
770600	CPI (personal & educational exp.)	365.7	184.1	1.99
770700	CPI (personal & educational exp.)	365.7	184.1	1.99
770800	CPI (personal & educational exp.)	365.7	184.1	1.99
770900	CPI (personal & educational exp.)	365.7	184.1	1.99
780100	Total CPI	311.1	181.5	1.71
780200	Total CPI	311.1	181.5	1.71
780300	Total CPI	311.1	181.5	1.71
780400	Total CPI	311.1	181.5	1.71
790100	Total CPI	311.1	181.5	1.71
790200	Total CPI	311.1	181.5	1.71
790300	Total CPI	311.1	181.5	1.71
800000	Total CPI	311.1	181.5	1.71
810001	Total CPI	311.1	181.5	1.71
810002	Total CPI	311.1	181.5	1.71
820000	Total CPI	311.1	181.5	1.71
830000	Total CPI	311.1	181.5	1.71
840000	Total CPI	311.1	181.5	1.71
850000	Total CPI	311.1	181.5	1.71

APPENDIX D

PRICE INDEX DIRECTORY
(continued)

I/O Code	Published Index Series	1984 Index	1977 Index	Adjust Index
880000	Total CPI	311.1	181.5	1.71
890000	Total CPI	311.1	181.5	1.71
900000	Total CPI	311.1	181.5	1.71

Source: Producer price information was obtained from the Producer Prices and Price Indexes Supplement 1978 Data for 1977, and Producer Prices and Price Indexes Supplement 1985 for 1984, U. S. Department of Labor, Bureau of Labor Statistics, Table 48 "Producer price indexes for commodity groupings and individual items, 1977, 1984, and consumer and construction price index information was obtained from the 1985 Statistical Abstract.

APPENDIX E

APPENDIX E

COUNTY BUSINESS PATTERNS INDUSTRY CODES

---- Total
07-- Agricultural Services, Forestry, and Fisheries
0700 Agricultural Services
0710 Soil Preparation Services
0720 Crop Services
0740 Veterinary Services
0750 Animal Services, Exc Vetr.
0760 Farm Labor and Mgmt Services
0761 Farm Labor Contractors
0762 Farm Management Services
0780 Landscape and Horticultural Services
0800 Forestry
0900 Fishing, Hunting, and Trapping
098/ Administrative and Auxiliary
10-- Mining
1000 Metal Mining
1010 Iron Ores
1020 Copper Ores
1030 Lead and Zinc Ores
1040 Gold and Silver Ores
1041 Gold Ores
1044 Silver Ores
1050 Bauxite and Other Aluminum Ores
1060 Ferroalloy Ores, Exc Vanadium
1080 Metal Mining Services
1090 Miscellaneous Metal Ores
1092 Mercury Ores
1094 Uranium-Radium-Vanadium Ores
1099 Metal Ores, NEC
1100 Anthracite Mining
1110 Anthracite Mining
1111 Anthracite
1112 Anthracite Mining Services
1200 Bituminous Coal and Lignite Services
1210 Bituminous Coal and Lignite Services
1211 Bituminous Coal and Lignite
1213 Bituminous Lignite Mining Services
1300 Oil and Gas Extraction
1310 Crude Petroleum and Natural Gas
1320 Natural Gas Liquids
1380 Oil and Gas Field Services
1381 Drilling Oil and Gas Wells
1382 Oil and Gas Exploration Services
1389 Oil and Gas Field Services, NEC
1400 Nonmetallic Minerals, Exc Fuels
3714 Motor Vehicle Parts and Accessories
3715 Truck Trailers
3716 Motor Homes
3720 Aircraft and Parts
3721 Aircraft
3724 Aircraft Engines and Engine Parts
3728 Aircraft Equipment, NEC
3730 Ship and Boat Building and Repairing
3731 Ship Building and Repairing
3732 Boat Building and Repairing
3740 Railroad Equipment
3750 Motorcycles, Bicycles, and Parts
3760 Guided Missiles, Space Vehicles, Parts
3761 Guided Missiles, Space Vehicles
3764 Space Propulsion Units and Parts
3769 Space Vehicle Equipment, NEC
3790 Misc Transportation Equipment
3792 Travel Trailers and Campers
3795 Tanks and Tank Components
3799 Transportation Equipment, NEC
3800 Instruments and Related Products
3810 Engineering Scientific Instruments
3820 Measuring and Controlling Devices
3822 Environmental Controls
3823 Process Control Instruments
3824 Fluid Meters and Counting Devices
3825 Instruments to Measure Electricity
3829 Measuring Controlling Devices, NEC
3830 Optical Instruments and Lenses
3840 Medical Instruments and Supplies
3841 Surgical and Medical Instruments
3842 Surgical Appliances and Supplies
3843 Dental Equipment and Supplies
3850 Ophthalmic Goods

1410 Dimension Stone
1420 Crushed and Broken Stone
1422 Crushed and Broken Limestone
1423 Crushed and Broken Granite
1429 Crushed and Broken Stone, NEC
1440 Sand and Gravel
1442 Construction Sand and Gravel
1446 Industrial Sand
1450 Clay and Related Minerals
1452 Bentonite
1453 Fire Clay
1454 Fuller's Earth
1455 Kaolin and Ball Clay
1459 Clay and Related Minerals, NEC
1470 Chemical and Fertilizer Minerals
1472 Barite
1473 Fluorspar
1474 Potash, Soda, and Borate Minerals
1475 Phosphate Rock
1476 Rock Salt
1477 Sulfur
1479 Chemical and Fertilizer Mining, NEC
1480 Nonmetallic Minerals Services
1481 Nonmetallic Minerals Services
1490 Miscellaneous Nonmetallic Minerals
1492 Gypsum
1496 Talc, Soapstone, and Pyrophyllite
1499 Nonmetallic Minerals, NEC
149/ Administrative and Auxiliary
15-- Contract Construction
1500 General Building Contractors
1510 General Building Contractors
1530 Operative Builders
1531 Operative Builders
1600 Heavy Construction Contractors
1610 Highway and Street Construction
1611 Highway and Street Construction
1620 Heavy Construction, Exc Highway
1700 Special Trade Contractors
1710 Plumbing, Heating, and Air Conditioning
1720 Painting, Paper Hanging, Decorating
1730 Electrical Work
1740 Masonry, Stonework, and Plastering
1741 Masonry and Other Stonework
1742 Plastering, Drywall and Insulation
3860 Photographic Equipment and Supplies
3870 Watches, Clocks, and Watchcases
3900 Misc Manufacturing Industries
3910 Jewelry, Silverware, and Plated Ware
3911 Jewelry, Precious Metal
3914 Silverware and Plated Ware
3915 Jewelers' Materials, Lapidary Work
3930 Musical Instruments
3940 Toys and Sporting Goods
3942 Dolls
3944 Games, Toys, and Children's Vehicles
3949 Sporting and Athletic Goods, NEC
3950 Pens, Pencils, Office and Art Supplies
3951 Pens and Mechanical Pencils
3952 Lead Pencils and Art Goods
3953 Marking Devices
3955 Carbon Paper and Inked Ribbons
3960 Costume Jewelry and Notions
3961 Costume Jewelry
3962 Artificial Flowers
3963 Buttons
3964 Needles, Pins, and Fasteners
3990 Misc Manufactures
3991 Brooms and Brushes
3993 Signs and Advertising Displays
3995 Burial Caskets
3996 Hard Surface Floor Coverings
3999 Manufacturing Industries, NEC
399/ Administrative and Auxiliary
40-- Transportation and Other Public Utilities
4000 Railroad Transportation
4010 Railroads
4011 Railroads, Line-Haul Operating
4013 Switching and Terminal Services
4040 Railway Express Service
4041 Railway Express Service
4100 Local and Interurban Passenger Transit
4110 Local and Suburban Transportation
4111 Local and Suburban Transit
4119 Local Passenger Transportation, NEC
4120 Taxicabs
4121 Taxicabs
4130 Intercity Highway

1743 Terrazzo, Tile, Marble, Mosaic Work
1750 Carpentering and Flooring
1751 Carpentering
1752 Floor Laying and Floor Work, NEC
1760 Roofing and Sheet Metal Work
1770 Concrete Work
1780 Water Well Drilling
1790 Misc. Special Trade Contractors
1791 Structural Steel Erection
1793 Glass and Glazing Work
1794 Excavating and Foundation Work
1795 Wrecking and Demolition Work
1796 Installing Building Equipment, NEC
1799 Special Trade Contractors, NEC
179/ Administrative and Auxiliary
19-- Manufacturing
2000 Food and Kindred Products
2010 Meat Products
2011 Meat Packing Plants
2013 Sausages and Other Prepared Meats
2016 Poultry Dressing Plants
2017 Poultry and Egg Processing
2020 Dairy Products
2021 Creamery Butter
2022 Cheese, Natural and Processed
2023 Condensed and Evaporated Milk
2024 Ice Cream and Frozen Desserts
2026 Fluid Milk
2030 Preserved Fruits and Vegetables
2032 Canned Specialties
2033 Canned Fruits and Vegetables
2034 Dehydrated Fruits, Vegetables, Soups
2035 Pickles, Sauces, and Salad Dressings
2037 Frozen Fruits and Vegetables
2038 Frozen Specialties
2040 Grain Mill Products
2041 Flour and Other Grain Mill Products
2043 Cereal Breakfast Foods
2044 Rice Milling
2045 Blended and Prepared Flour
2046 Wet Corn Milling
2047 Dog, Cat, and Other Pet Food
2048 Prepared Feeds, NEC
2050 Bakery Products
2051 Bread, Cake, and Related Products
2052 Cookies and Crackers
2060 Sugar and Confectionery Products
Transportation
4131 Intercity Highway Transportation
4140 Transportation Charter Service
4141 Local Passenger Charter Service
4142 Charter Service, Exc Local
4150 School Buses
4151 School Buses
4170 Bus Terminal and Service Facilities
4171 Bus Terminal Facilities
4172 Bus Service Facilities
4200 Trucking and Warehousing
4210 Trucking, Local and Long Distance
4220 Public Warehousing
4221 Farm Product Warehousing and Storage
4222 Refrigerated Warehousing
4224 Household Goods Warehousing
4225 General Warehousing and Storage
4226 Special Warehousing and Storage, NEC
4229
4230 Trucking Terminal Facilities
4231 Trucking Terminal Facilities
4300 U.S. Postal Service
4310 U.S. Postal Service
4311 U.S. Postal Service
4400 Water Transportation
4410 Deep Sea Foreign Transportation
4411 Deep Sea Foreign Transportation
4420 Deep Sea Domestic Transportation
4421 Noncontiguous Area Transportation
4422 Coastwise Transportation
4423 Intercoastal Transportation
4430 Great Lakes Transportation
4431 Great Lakes Transportation
4440 Transportation on Rivers and Canals
4441 Transportation on Rivers and Canals
4450 Local Water Transportation
4460 Water Transportation Services
4463 Marine Cargo Handling
4464 Canal Operation
4469 Water Transportation Services, NEC
4500 Transportation by Air

2061 Raw Cane Sugar
2062 Cane Sugar Refining
2063 Beet Sugar
2065 Confectionery Products
2066 Chocolate and Cocoa Products
2067 Chewing Gum
2070 Fats and Oils
2074 Cottonseed Oil Mills
2075 Soybean Oil Mills
2076 Vegetable Oil Mills, NEC
2077 Anaimal and Marine Fats and Oils
2079 Shortening and Cooking Oils
2080 Beverages
2082 Malt Beverages
2083 Malt
2084 Wines, Brandy, and Brandy Spirits
2085 Distilled Liquor, Exc Brandy
2086 Bottled and Canned Soft Drinks
2087 Flavoring Extracts and Syrups, NEC
2090 Misc. Foods and Kindred Products
2091 Canned and Cured Seafoods
2092 Fresh or Frozen Packaged Fish
2095 Roasted Coffee
2097 Manufactured Ice
2098 Macaroni and Spaghetti
2099 Food Preparations, NEC
2100 Tobacco Manufactures
2110 Cigarettes
2120 Cigars
2130 Chewing and Smoking Tobacco
2140 Tobacco Stemming and Redrying
2200 Textile Mill Products
2210 Weaving Mills, Cotton
2220 Weaving Mills, Synthetics
2230 Weaving and Finishing Mills, Wool
2240 Narrow Fabric Mills
2250 Knitting Mills
2251 Women's Hosiery, Exc Socks
2252 Hosiery, NEC
2253 Knit Outerwear Mills
2254 Knit Underwear Mills
2257 Circular Knit Fabric Mills
2258 Warp Knit Fabric Mills
2259 Knitting Mills, NEC
2260 Textile Finishing, Exc Wool
2261 Finishing Plants, Cotton
2262 Finishing Plants, Synthetics
2269 Finishing Plants, NEC
2270 Floor Covering Mills
2271 Woven Carpets and Rugs
4510 Certificated Air Transportation
4580 Air Transportation Services
4600 Pipe Lines, Exc Natural Gas
4610 Pipe Lines, Exc Natural Gas
4619 Pipe Lines, NEC
4700 Transportation Services
4710 Freight Forwarding
4712 Freight Forwarding
4720 Arrangement of Transportation
4722 Passenger Transportation Arrangement
4723 Freight Transportation Arrangement
4740 Rental of Railroad Cars
4780 Misc Transportation Services
4782 Inspection and Weighing Services
4800 Communication
4810 Telephone Communication
4811 Telephone Communication
4820 Telegraph Communication
4821 Telegraph Communication
4830 Radio and Television Broadcasting
4890 Communication Services, NEC
4899 Communication Services, NEC
4900 Electric, Gas, and Sanitary Services
4910 Electric Services
4911 Electric Services
4920 Gas Production and Distribution
4930 Combination Utility Services
4931 Electric and Other Services Combined
4932 Gas and Other Services Combined
4939 Combination Utility Services, NEC
4940 Water Supply
4941 Water Supply
4950 Sanitary Services
4960 Steam Supply
4961 Steam Supply
4970 Irrigation Systems
4971 Irrigation Systems
497/ Administrative and Auxiliary
50-- Wholesale Trade
5000 Wholesale Trade-Durable Goods
5010 Motor Vehicles, Automotive Equipment
5012 Automodiles and Other Motor Vehicles
5013 Automotive Parts and Supplies

2272 Tufted Carpets and Rugs
2279 Carpets and Rugs, NEC
2280 Yarn and Thread Mills
2281 Yarn Mills, Exc Wool
2282 Throwing and Winding Mills
2283 Wool Yarn Mills
2284 Thread Mills
2290 Misc Textile Goods
2291 Felt Goods, Exc Woven Felts
2292 Lace Goods
2293 Paddings and Upholstery Filling
2294 Processed Textile Waste
2295 Coated Fabrics, Not Rubberized
2296 Tire Cord and Fabric
2297 Nonwoven Fabrics
2298 Cordage and Twine
2299 Textile Goods, NEC
2300 Apparel and Other Textile Products
2310 Men's and Boy's Suits and Coats
2320 Men's and Boy's Furnishings
2321 Men's and Boy's Shirts and Nightwear
2322 Men's and Boy's Underwear
2323 Men's and Boy's Neckwear
2327 Men's and Boy's Separate Trousers
2328 Men's and Boy's Work Clothing
2329 Men's and Boy's Clothing, NEC
2330 Women's and Misses' Outerwear
2331 Women's and Misses' Blouses Waists
2335 Women's and Misses' Dresses
2337 Women's and Misses' Suits and Coats
2339 Women's and Misses' Outerwear, NEC
2340 Women's and Children's Undergarments
2341 Women's and Children's Underwear
2342 Brassieres
2350 Hats, Coats, and Millinery
2351 Millinery
2352 Hats and Caps, Exc Millinery
2360 Children's Outerwear
2361 Children's Dresses and Blouses
2363 Children's Coats and Suits
2369 Children's Outerwear, NEC
2370 Fur Goods
2380 Misc Apparel and Accessories
2381 Fabric Dress and Work Gloves
2384 Robes and Dressing Gowns
5014 Tires and Tubes
5020 Furniture and Home Furnishings
5021 Furniture
5023 Home Furnishings
5030 Lumber and Construction Materials
5031 Lumber, Plywood and Millwork
5039 Construction Materials, NEC
5040 Sporting Goods, Toys, and Hobby Goods
5041 Sporting and Recreational Goods
5042 Toys and Hobby Goods and Supplies
5043 Photographic Equipment and Supplies
5050 Metals and Minerals, Exc Petroleum
5051 Metals Service Centers and Offices
5052 Coal and Other Minerals and Ores
5060 Electrical Goods
5063 Electrical Apparatus and Equipment
5064 Electrical Appliances, TV and Radios
5065 Electronic Parts and Equipment
5070 Hardware, Plumbing and Heating Equipment
5072 Hardware
5074 Plumbing and Hydronic Heating Supplies
5075 Warm Air Heating and Air Conditioning
5078 Refrigeration Equipment and Supplies
5080 Machinery, Equipment, and Supplies
5081 Commercial Machines and Equipment
5082 Construction and Mining Machinery
5083 Farm Machinery and Equipment
5084 Industrial Machinery and Equipment
5085 Industrial Supplies
5086 Professional Equipment and Supplies
5087 Service Establishment Equipment
5088 Transportation Equipment and Supplies
5090 Misc Durable Goods

2385 Waterproof Outergarments
2386 Leather and Sheep Lined Clothing
2387 Apparel Belts
2389 Apparel and Accessories, NEC
2390 Misc Fabricated Textile Products
2391 Curtains and Draperies
2392 House Furnishings, NEC
2393 Textile Bags
2394 Canvas and Related Products
2395 Pleating and Stitching
2396 Automotive and Apparel Trimmings
2397 Schiffi Machine Embroideries
2399 Fabricated Textile Products, NEC
2400 Lumber and Wood Products
2410 Logging Camps and Contractors
2420 Sawmills and Planing Mills
2421 Sawmills and Planing Mills, General
2426 Hardwood Dimension and Flooring
2429 Special Product Sawmills, NEC
2430 Millwork, Plywood Structural Members
2431 Millwork
2434 Wood Kitchen Cabinets
2435 Hardwood Veneer and Plywood
2436 Softwood Veneer and Plywood
2439 Structural Wood Members, NEC
2440 Wood Containers
2441 Nailed Wood Boxes and Shook
2448 Wood Pallets and Skids
2449 Wood Containers, NEC
2450 Wood Buildings and Mobile Homes
2451 Mobile Homes
2452 Prefabricated Wood Buildings
2490 Misc Wood Products
2491 Wood Preserving
2492 Particleboard
2499 Wood Products, NEC
2500 Furniture and Fixtures
2510 Household Furniture
2511 Wood Household Furniture
2512 Upholstered Household Furniture
2514 Metal Household Furniture
2515 Mattresses and Bedsprings
2517 Wood TV and Radio Cabinets
2519 Household Furniture, NEC
2520 Office Furniture
2521 Wood Office Furniture
5093 Scrap and Waste Materials
5094 Jewelry, Watches, and Precious Stones
5099 Durable Goods, NEC
5100 Wholesale Trade-Nondurable Goods
5110 Paper and Paper Products
5111 Printing and Writing Paper
5112 Stationery Supplies
5113 Industrial and Personal Service Paper
5120 Drugs, Proprietaries, and Sundries
5130 Apparel, Piece Goods, and Notions
5133 Piece Goods
5134 Notions and Other Dry Goods
5136 Men's Clothing and Furnishings
5137 Women's and Children's Clothing
5139 Footwear
5140 Groceries and Related Products
5141 Groceries, General Line
5142 Frozen Foods
5143 Dairy Products
5144 Poultry and Poultry Products
5145 Confectionery
5146 Fish and Seafoods
5147 Meats and Meat Products
5148 Fresh Fruits and Vegetables
5149 Groceries and Related Products, NEC
5150 Farm-Product Raw Materials
5152 Cotton
5153 Grain
5154 Livestock
5159 Farm-Product Raw Materials, NEC
5160 Chemicals and Allied Products
5170 Petroleum and Petroleum Products
5171 Petroleum Bulk Stations and Terminals
5172 Petroleum Products, NEC
5180 Beer, Wine, and Distilled Beverages
5181 Beer and Ale
5182 Wines and Distilled Beverages
5190 Misc Nondurable Goods
5191 Farm Supplies
5194 Tobacco and Tobacco Products
5198 Paints, Varnishes, and Supplies
5199 Nondurable Goods, NEC
519/ Administrative and Auxiliary

2522 Metal Office Furniture
2530 Public Building Related Furniture
2540 Partitions and Fixtures
2541 Wood Partitions and Fixtures
2542 Metal Partitions and Fixtures
2590 Misc Furniture and Fixtures
2591 Drapery Hardware, Blinds, Shades
2599 Furniture and Fixtures, NEC
2600 Paper and Allied Products
2610 Pulp Mills
2620 Paper Mills, Exc Building Paper
2630 Paperboard Mills
2640 Misc Converted Paper Products
2641 Paper Coating and Glazing
2642 Envelopes
2643 Bags, Exc Textile Bags
2645 Die-Cut Paper and Board
2646 Pressed and Molded Pulp Goods
2647 Sanitary Paper Products
2648 Stationery Products
2649 Converted Paper Products, NEC
2650 Paperboard Containers and Boxes
2651 Folding Paperboard Boxes
2652 Set-up Paperboard Boxes
2653 Corrugated and Solid Fiber Boxes
2654 Sanitary Food Containers
2655 Fiber Cans, Drums, Similar Products
2660 Building Paper and Board Mills
2700 Printing and Publishing
2710 Newspapers
2720 Periodicals
2730 Books
2731 Book Publishing
2732 Book Printing
2740 Misc Publishing
2750 Commercial Printing
2751 Commercial Printing, Letterpress
2752 Commercial Printing, Lithographic
2753 Engraving and Plate Printing
2754 Commercial Printing, Gravure
2760 Manifold Business Forms
2770 Greeting Card Publishing
2780 Blankbooks and Bookbinding
2782 Blankboods and Looseleaf Binders
2789 Bookbinding and Related Work
2790 Printing Trade Services

52-- Retail Trade
5200 Building Materials and Garden Supplies
5210 Lumber and Other Building Materials
5230 Paint, Glass, and Wallpaper Stores
5250 Hardware Stores
5260 Retail Nurseries and Garden Stores
5270 Mobile Home Dealers
5300 General Merchandise Stores
5310 Department Stores
5330 Variety Stores
5390 Misc General Merchandise Stores
5400 Food Stores
5410 Grocery Stores
5420 Meat Markets and Freezer Provisioners
5422 Freezer and Locker Meat Provisioners
5423 Meat and Fish (Seafood) Markets
5430 Fruit Stores and Vegetable Markets
5440 Candy, Nut, and Confectionery Stores
5450 Dairy Products Stores
5460 Retail Bakeries
5490 Misc Food Stores
5500 Automotive Dealers and Service Stations
5510 New and Used Car Dealers
5520 Used Car Dealers
5530 Auto and Home Supply Stores
5540 Gasoline Service Stations
5550 Boat Dealers
5560 Recreation and Utility Trailer Dealers
5570 Motorcycle Dealers
5590 Automotive Dealers, NEC
5600 Apparel and Accessory Stores
5610 Men's and Boy's Clothing and Furnishings
5620 Women's Ready-to-Wear Stores
5630 Women's Accessory and Specialty Stores
5640 Children's and Infant's Wear Stores
5650 Family Clothing Stores
5660 Shoe Stores
5680 Furriers and Fur Shops
5690 Misc Apparel Accessories
5700 Furniture and Home Furnishings

2791 Typesetting
2793 Photoengraving
2794 Electrotyping and Stereotyping
2795 Lithographic Platemaking Services
2800 Chemicals and Allied Products
2810 Industrial Inorganic Chemicals
2812 Alkalies and Chlorine
2813 Industrial Gases
2816 Inorganic Pigments
2819 Industrial Inorganic Chemicals, NEC
2820 Plastics Materials and Synthetics
2821 Plastics Materials and Resins
2822 Synthetic Rubber
2823 Cellulosic Man-Made Fibers
2824 Organic Fibers, Noncellulosic
2830 Drugs
2831 Biological Products
2833 Medicinals and Botanicals
2834 Pharmaceutical Preparations
2840 Soap, Cleaners, and Toilet Goods
2841 Soap and Other Detergents
2842 Polishes and Sanitation Goods
2843 Surface Active Agents
2844 Toilet Preparations
2850 Paints and Allied Products
2860 Industrial Organic Chemicals
2861 Gum and Wood Chemicals
2865 Cyclic Crudes and Intermediates
2869 Industrial Organic Chemicals, NEC
2870 Agricultural Chemicals
2873 Nitrogenous Fertilizers
2874 Phosphatic Fertilizers
2875 Fertilizers, Mixing Only
2879 Agricultural Chemicals, NEC
2890 Misc Chemical Products
2891 Adhesives and Sealants
2892 Explosives
2893 Printing Ink
2895 Carbon Black
2899 Chemical Preparations, NEC
2900 Petroleum and Coal Products
2910 Petroleum Refining
2950 Paving and Roofing Materials
2951 Paving Mixtures and Blocks
2952 Asphalt Felts and Coatings
2990 Misc Petroleum and Coal Products
2992 Lubricating Oils and Greases
2999 Petroleum and Coal Products, NEC
Stores
5710 Furniture and Home Furnishings Stores
5712 Furniture Stores
5713 Floor Covering Stores
5714 Drapery and Upholstery Stores
5719 Misc Home Furnishings Stores
5720 Household Appliance Stores
5730 Radio, Television, and Music Stores
5732 Radio and Television Stores
5733 Music Stores
5800 Eating and Drinking Places
5810 Eating and Drinking Places
5812 Eating Places
5813 Drinking Places
5900 Misc Retail
5910 Drug Stores and Proprietary Stores
5920 Liquor Stores
5930 Used Merchandise Stores
5940 Misc Shopping Goods Stores
5941 Sporting Goods and Bicycle Shops
5942 Book Stores
5943 Stationery Stores
5944 Jewelry Stores
5945 Hobby, Toy, and Game Shops
5946 Camera and Photographic Supply Stores
5947 Gift, Novelty, and Souvenir Shops
5948 Luggage and Leather Goods Stores
5949 Sewing, Needlework, and Piece Goods
5960 Nonstore Retailers
5961 Mail Order Houses
5962 Merchandising Machine Operators
5963 Direct Selling Organizations
5980 Fuel and Ice Dealers
5982 Fuel and Ice Dealers, NEC
5983 Fuel Oil Dealers
5984 Liquefied Petroleum Gas Dealers
5990 Retail Stores, NEC
5992 Florists
5993 Cigar Stores and Stands
5994 News Dealers and Newsstands
5999 Misc Retail Stores, NEC
599/ Administrative and Auxiliary
60-- Finance, Insurance, and Real Estate
6000 Banking

3000 Rubber and Misc Plastics Products
3010 Tires and Inner Tubes
3020 Rubber and Plastics Footwear
3030 Reclaimed Rubber
3040 Rubber and Plastics Hose and Belting
3060 Fabricated Rubber Products, NEC
3070 Misc Plastics Products
3100 Leather and Leather Products
3110 Leather Tanning and Finishing
3130 Boot and Shoe Cut Stock and Findings
3140 Footwear, Exc Rubber
3142 House Slippers
3143 Men's Footwear, Exc Athletic
3144 Women's Footwear, Exc Athletic
3149 Footwear, Exc Rubber, NEC
3150 Leather Gloves and Mittens
3160 Luggage
3170 Handbags and Personal Leather Goods
3171 Women's Handbags and Purses
3172 Personal Leather Goods, NEC
3190 Leather Goods, NEC
3200 Stone, Clay, and Glass Products
3210 Flat Glass
3220 Glass and Glassware, Pressed Or Blown
3221 Glass Containers
3229 Pressed and Blown Glass, NEC
3230 Products of Purchased Glass
3240 Cement, Hydraulic
3250 Structural Clay Products
3251 Brick and Structural Clay Tile
3253 Ceramic Wall and Floor Tile
3255 Clay Refractories
3259 Structural Clay Products, NEC
3260 Pottery and Related Products
3261 Vitreous Plumbing Fixtures
3262 Vitreous China Food Utensils
3263 Fine Earthenware Food Utensils
3264 Porcelain Electrical Supplies
3269 Pottery Products, NEC
3270 Concrete, Gypsum, and Plaster Products
3271 Concrete Block and Brick
3272 Concrete Products, NEC
3273 Ready-Mixed Concrete
3274 Lime
3275 Gypsum Products

6010 Federal Reserve Banks
6020 Commercial and Stock Savings Banks
6030 Mutual Savings Banks
6040 Trust Companies, Nondeposit
6050 Functions Closely Related to Banking
6100 Credit Agencies Other Than Banks
6110 Rediscount and Financing Institutions
6112 Rediscounting, Not for Agricultural
6113 Rediscounting, for Agricultural
6120 Savings and Loan Associations
6130 Agricultural Credit Institutions
6140 Personal Credit Institutions
6150 Business Credit Institutions
6160 Mortgage Bankers and Brokers
6200 Security, Commodity Brokers and Services
6210 Security Brokers and Dealers
6220 Commodity Contracts Brokers, Dealers
6230 Security and Commodity Exchanges
6280 Sercurity and Commodity Services
6300 Insurance Carriers
6310 Life Insurance
6320 Medical Service and Health Insurance
6321 Accident and Health Insurance
6324 Hospital and Medical Service Plans
6330 Fire, Marine, and Casualty Insurance
6350 Surety Insurance
6360 Title Insurance
6370 Pension, Health, and Welfare Funds
6390 Insurance Carriers, NEC
6400 Insurance Agents, Brokers and Service
6410 Insurance Agents, Brokers and Service
6500 Real Estate
6510 Real Estate Operators and Lessors
6530 Real Estate Agents and Managers
6540 Title Abstract Offices
6550 Subdividers and Developers

3280 Cut Stone and Stone Products
3290 Misc Nonmetallic Mineral Products
3291 Abrasive Products
3292 Asbestos Products
3293 Gaskets, Packing and Sealing Devices
3295 Minerals, Ground or Treated
3296 Mineral Wool
3297 Nonclay Refractories
3299 Nonmetallic Mineral Products, NEC
3300 Primary Metal Industries
3310 Blast Furnace and Basic Steel Products
3312 Blast Furnaces and Steel Mills
3313 Electrometallurgical Products
3315 Steel Wire and Related Products
3316 Cold Finishing of Steel Shapes
3317 Steel Pipe and Tubes
3320 Iron and Steel Foundries
3321 Gray Iron Foundries
3322 Malleable Iron Foundries
3324 Steel Investment Foundries
3325 Steel Foundries, NEC
3330 Primary Nonferrous Metals
3331 Primary Copper
3332 Primary Lead
3333 Primary Zinc
3334 Primary Aluminum
3339 Primary Nonferrous Metals, NEC
3340 Secondary Nonferrous Metals
3350 Nonferrous Rolling and Drawing
3351 Copper Roling and Drawing
3353 Aluminum Sheet, Plate, and Foil
3354 Aluminum Extruded Products
3355 Aluminum Rolling and Drawing, NEC
3356 Nonferrous Rolling and Drawing, NEC
3357 Nonferrous Wire Drawing Insulating
3360 Nonferrous Foundries
3361 Aluminum Foundries
3362 Brass, Bronze, and Copper Foundries
3369 Nonferrous Foundries, NEC
3390 Misc Primary Metal Products
3398 Metal Heat Treating
3399 Primary Metal Products, NEC
3400 Fabricated Metal Products
3410 Metal Cans and Shipping
6552 Subdividers and Developers, NEC
6553 Cemetery Subdividers and Developers
6600 Combined Real Estate, Insurance, Etc
6610 Combined Real Estate, Insurance, Etc
6700 Holding and Other Investment Offices
6710 Holding Offices
6720 Investment Offices
6730 Trusts
6732 Educational, Religious, Etc Trusts
6733 Trusts, NEC
6790 Misc Investing
6794 Patent Owners and Lessors
6798 Real Estate Investment Trusts
6799 Investors, NEC
679/ Administrative and Auxiliary
70-- Services
7000 Hotels and Other Lodging Places
7010 Hotels, Motels, and Tourist Courts
7020 Rooming and Boarding Houses
7030 Camps and Trailering Parks
7032 Sporting and Recreational Camps
7033 Trailering Parks for Transients
7040 Membership-Basis Organization Hotels
7200 Personal Services
7210 Laundry, Cleaning, and Garment Services
7211 Power Laundries, Family and Commercial
7212 Garment Pressing and Cleaner's Agents
7213 Linen Supply
7214 Diaper Service
7215 Coin-Operated Laundries and Cleaning
7216 Dry Cleaning Plants, Exc Rug
7217 Carpet and Upholstery Cleaning
7218 Industrial Launderers
7219 Laundry and Garment Services, NEC
7220 Photographic Studios, Portrait
7230 Beauty Shops
7240 Barber Shops
7250 Shoe Repair and Hat Cleaning Shops

Containers
3411 Metal Cans
3412 Metal Barrels, Drums, and Pails
3420 Cutlery, Hand Tools, and Hardware
3421 Cutlery
3423 Hand and Edge Tools, NEC
3425 Hand Saws and Saw Blades
3429 Hardware, NEC
3430 Plumbing and Heating, Exc Electric
3431 Metal Sanitary Ware
3432 Plumbing Fittings and Brass Goods
3433 Heating Equipment, Exc Electric
3440 Fabricated Structural Metal Products
3441 Fabricated Structural Metal
3442 Metal Doors, Sash, and Trim
3443 Fabricated Plate Work (Boiler Shops)
3444 Sheet Metal Work
3446 Architectural Metal Work
3448 Prefabricated Metal Buildings
3449 Misc Metal Work
3450 Screw Machine Products, Bolts, Etc
3451 Screw Machine Products
3452 Bolts, Nuts, Rivets, and Washers
3460 Metal Forgings and Stampings
3462 Iron and Steel Forgings
3463 Nonferrous Forgings
3465 Automotive Stampings
3466 Crowns and Closures
3469 Metal Stampings, NEC
3470 Metal Services, NEC
3471 Plating and Polishing
3479 Metal Coating and Allied Services
3480 Ordnance and Accessories, NEC
3482 Small Arms Ammunition
3483 Ammunition, Exc for Small Arms, NEC
3484 Small Arms
3489 Ordnance and Accessories, NEC
3490 Misc Fabricated Metal Products
3493 Steel Springs, Exc Wire
3494 Valves and Pipe Fittings
3495 Wire Springs
3496 Misc Fabricated Wire Products
3497 Metal Foil and Leaf
3498 Fabricated Pipe and Fittings
7260 Funeral Service and Crematories
7290 Misc Personal Services
7300 Business Services
7310 Advertising
7311 Advertising Agencies
7312 Outdoor Advertising Agencies
7313 Radio, TV, Publisher Representatives
7319 Advertising, NEC
7320 Credit Reporting and Collection
7330 Mailing, Reproduction, Stenographic
7331 Direct Mail Advertising Services
7332 Blueprinting and Photocopying
7333 Commercial Photography and Art
7339 Stenographic and Reproduction, NEC
7340 Services to Buildings
7341 Window Cleaning
7342 Disinfecting and Exterminating
7349 Building Maintenance Services, NEC
7350 News Syndicates
7360 Personnel Supply Services
7361 Employment Agencies
7362 Temporary Help Supply Services
7369 Personnel Supply Services, NEC
7370 Computer and Data Processing Services
7372 Computer Programming and Software
7374 Data Processing Services
7379 Computer Related Servics, NEC
7390 Misc Business Services
7391 Research and Development Laboratories
7392 Management and Public Relations
7393 Detective and Protective Services
7394 Equipment Rental and Leasing
7395 Photofinishing Laboratories
7396 Trading Stamp Services
7397 Commercial Testing Laboratories
7399 Business Services, NEC
7500 Auto Repair, Services, and Garages
7510 Automotive Rentals, Without Drivers
7512 Passenger Car Rental and Leasing

3499 Fabricated Metal Products, NEC
3500 Machinery, Exc Electrical
3510 Engines and Turbines
3511 Turbines and Turbine Generator Sets
3519 Internal Combustion Engines, NEC
3520 Farm and Garden Machinery
3523 Farm Machinery and Equipment
3524 Lawn and Garden Equipment
3530 Construction and Related Machinery
3531 Construction Machinery
3532 Mining Machinery
3533 Oil Field Machinery
3534 Elevators and Moving Stairways
3535 Conveyors and Conveying Equipment
3536 Hoists, Cranes, and Monorails
3537 Industrial Trucks and Tractors
3540 Metalworking Machinery
3541 Machine Tools, Metal Cutting Types
3542 Machine Tools, Metal Forming Types
3544 Special Dies, Tools, Jigs Fixtures
3545 Machine Tool Accessories
3546 Power Drive Hand Tools
3547 Rolling Mill Machinery
3549 Metalworking Machinery, NEC
3550 Special Industry Machinery
3551 Food Products Machinery
3552 Textile Machinery
3553 Woodworking Machinery
3554 Paper Industries Machinery
3555 Printing Trades Machinery
3559 Special Industry Machinery, NEC
3560 General Industrial Machinery
3561 Pumps and Pumping Equipment
3562 Ball and Roller Bearings
3563 Air and Gas Compressors
3564 Blowers and Fans
3565 Industrial Patterns
3566 Speed Changes, Drives, and Gears
3567 Industrial Furnaces and Ovens
3568 Power Transmission Equipment, NEC
3569 General Industrial Machinery, NEC
3570 Office and Computing Machines
3572 Typewriters
3573 Electronic Computing Equipment
7513 Truck Rental and Leasing
7519 Utility Trailer Rental
7520 Automobile Parking
7523 Parking Lots
7525 Parking Structures
7530 Automotive Repair Shops
7531 Top and Body Repair Shops
7534 Tire Retreading and Repair Shops
7535 Paint Shops
7538 General Automotive Repair Shops
7539 Automotive Repair Shops, NEC
7540 Automotive Services, Exc Repair
7542 Car Washes
7549 Automotive Services, NEC
7600 Misc Repair Services
7620 Electrical Repair Shops
7622 Radio and Television Repair
7623 Refrigeration Service and Repair
7629 Electrical Repair Shops, NEC
7630 Watch, Clock, and Jewelry Repair
7640 Reupholstery and Furniture Repair
7690 Misc Repair Shops
7692 Welding Repair
7694 Armature Rewinding Shops
7699 Repair Services, NEC
7800 Motion Pictures
7810 Motion Picture Production and and Services
7813 Motion Picture Production, Exc TV
7814 Motion Picture Production for TV
7819 Services Allied to Motion Pictures
7820 Motion Picture Distribution and Services
7823 Motion Picture Film Exchanges
7824 Film or Tape Distribution for TV
7829 Motion Picture Distribution Services
7830 Motion Picture Theaters
7832 Motion Picture Theaters, Exc Drive-In
7833 Drive-In Motion Picture Theaters
7900 Amusement and Recreation Services
7910 Dance Halls, Studios, and

3574 Calculating and Accounting Machines
3576 Scales and Balances, Exc Laboratory
3579 Office Machines, NEC
3580 Refrigeration and Service Machinery
3581 Automatic Merchandising Machines
3582 Commercial Laundry Equipment
3585 Refrigeration and Heating Equipment
3586 Measuring and Dispensing Pumps
3589 Service Industry Machinery, NEC
3590 Misc Machinery, Exc Electrical
3592 Carburetors, Pistons, Rings, Valves
3599 Machinery, Exc Electrical, NEC
3600 Electric and Electronic Equipment
3610 Electric Distributing Equipment
3612 Transformers
3613 Switchgear and Switchboard Apparatus
3620 Electrical Industrial Apparatus
3621 Motors and Generators
3622 Industrial Controls
3623 Welding Apparatus, Electric
3624 Carbon and Graphite Products
3629 Electrical Industrial Apparatus, NEC
3630 Household Appliances
3631 Household Cooking Equipment
3632 Household Refrigerators and Freezers
3633 Household Laundry Equipment
3634 Electric Housewares and Fans
3635 Household Vacuum Cleaners
3636 Sewing Machines
3639 Household Appliances, NEC
3640 Electric Lighting and Wiring Equipment
3641 Electric Lamps
3643 Current-Carrying Wiring Devices
3644 Noncurrent-Carrying Wiring Devices
3645 Residential Lighting Fixtures
3646 Commercial Lighting Fixtures
3647 Vehicular Lighting Equipment
3648 Lighting Equipment, NEC
3650 Radio and TV Receiving
Schools
7920 Producers, Orchestras, Entertainers
7922 Theatrical Producers and Services
7929 Entertainers and Entertainment Groups
7930 Bowling and Billiard Establishments
7932 Billiard and Pool Establishments
7933 Bowling Alleys
7940 Commercial Sports
7941 Sports Clubs and Promoters
7948 Racing, Including Track Operation
7990 Misc Amusement, Recreational Service
7992 Public Golf Courses
7993 Coin-Operated Amusement Devices
7996 Amusement Parks
7997 Membership Sports and Recreation Clubs
7999 Amusement and Recreation, NEC
8000 Health Services
8010 Offices of Physicians
8020 Offices of Dentists
8030 Offices of Osteopathic Physicians
8040 Offices of Other Health Practitioners
8041 Offices of Chiropractors
8042 Offices of Optometrists
8049 Offices of Health Practitioners, NEC
8050 Nursing and Personal Care Facilities
8060 Hospitals
8070 Medical and Dental Laboratories
8071 Medical Laboratories
8072 Dental Laboratories
8080 Outpatient Care Facilities
8090 Health and Allied Services, NEC
8100 Legal Services
8110 Legal Services
8200 Educational Services
8210 Elementary and Secondary Schools
8220 Colleges and Universities
8230 Libraries and Information Centers
8240 Correspondence and Vocational

Equipment
3651 Radio and TV Receiving Sets
3652 Phonograph Records
3660 Communication Equipment
3661 Telephone and Telegraph Apparatus
3662 Radio and TV Communication Equipment
3670 Electronic Components and Accessories
3671 Electron Tubes, Receiving Type
3672 Cathode Ray Television Picture Tubes
3673 Electron Tubes, Transmitting
3674 Semiconductors and Related Devices
3675 Electronic Capacitors
3676 Electronic Resistors
3677 Electronic Coils and Transformers
3678 Electronic Connectors
3679 Electronic Components, NEC
3690 Misc Electrical Equipment, Supplies
3691 Storage Batteries
3692 Primary Batteries, Dry and Wet
3693 X-Ray Apparatus and Tubes
3694 Engine Electrical Equipment
3699 Electrical Equipment, Supplies, NEC
3700 Transportation Equipment
3710 Motor Vehicles and Equipment
3711 Motor Vehicles and Car Bodies
3713 Truck and Bus Bodies
Schools
8241 Correspondence Schools
8290 Schools and Educational Services, NEC
8300 Social Services
8310 Social Services, NEC
8360 Residential Care
8361 Residential Care
8400 Museums, Botanical, Zoological Gardens
8410 Museums and Art Galleries
8420 Botanical and Zoological Gardens
8600 Membership Organizations
8610 Business Associations
8620 Professional Organizations
8630 Labor Organizations
8640 Civic and Social Associations
8650 Political Organizations
8660 Religious Organizations
8690 Membership Organizations, NEC
8900 Misc Services
8910 Engineering and Architectural Services
8920 Noncommercial Research Organizations
8930 Accounting, Auditing and Bookkeeping
8990 Services, NEC
899/ Administrative and Auxiliary
989/ Administrative and Auxiliary
99-- Unclassified Establishments
9900 Nonclassifiable Establishments
9990 Nonclassifiable Establishments
9999 Nonclassifiable Establishments

APPENDIX F

APPENDIX F

```
*CBP.FTN
*
*FORTRAN77 DATA MANAGEMENT PROGRAM FOR MMS YEAR II STUDY
*THIS PROGRAM:
*  1. TAKES THE PREPARED CBP DATA FOR ONE STUDY AREA, MAKES MIDPOINT
*     EMPLOYMENT ESTIMATES, AND FORCES THE EMPLOYMENT ESTIMATES AT A
*     GIVEN INDUSTRY LEVEL TO SUM TO THE NEXT HIGHEST INDUSTRY LEVEL.
*
*  2. IMPUTES WAGES TO THE SUPPRESSED INDUSTRIES.
*
*  3. COLLAPSES THE 1148 SIC EMPLOYMENT AND WAGES TO THE 520 ODD
*     INPUT-OUTPUT MODEL SECTORS.  ZEROES APPEAR FOR
*     FOR THE EMPLOYMENT AND WAGES OF THOSE IN THE 520 THAT ARE NOT
*     PRESENT IN THE STUDY AREA.  THE "BRIDGE" FROM THE 1148 SIC
*     CODES TO THE 520 ODD I/O SECTORS IS CONTAINED IN A SUBROUTINE
*     OF THE PROGRAM.
*
*  4. COMPUTES THE RATIOS OF THE EMPLOYMENTS IN THE 520 I/O SECTORS TO
*     THE EMPLOYMENTS OF THE MMS I/O SECTORS (THERE ARE 116 OF THEM)
*     TO WHICH THEY BELONG, RESPECTIVELY.  THE "BRIDGE" FROM THE 520
*     ODD I/O SECTORS TO THE 116 MMS I/O SECTORS IS CONTAINED IN A
*     SUBROUTINE OF THE PROGRAM AND CAN BE REFERENCED IN DELIVERABLE 3.
*     THE RATIOS ARE REFERRED TO AS "INDUSTRY WEIGHTS".
*************************************************************************
*THE OUTPUT FILE CONSISTS OF 4 COLUMNS (VARIABLES):
*  1. THE LIST OF THE 520 ODD I/O INDUSTRY CODE NUMBERS.
*  2. THE I/O INDUSTRY EMPLOYMENT FOR THE STUDY AREA BEING RUN.
*  3. THE I/O INDUSTRY ANNUAL WAGE FOR THE STUDY AREA BEING RUN.
*  4. THE "INDUSTRY WEIGTS" FOR THE I/O INDUSTRIES OF THE STUDY AREA.
*************************************************************************
*SEVENTEEN VARIABLES ARE READ IN FROM THE STUDY AREA CBP DATA FILE.
* THE VARIABLES ARE THE STATE-COUNTY FIPS CODE, THE SIC CODE,
*  EMPLOYMENT (0 IF UNKNOWN), ANNUAL WAGES ( 0 IF UNKNOWN),
*  AND THE THIRTEEN SIZE RANGE FIRM COUNTS
*************************************************************************
*THREE VARIABLES ARE READ IN FROM THE U.S. CBP DATA FILE.  THE
* VARIABLES ARE THE SIC CODE LIST, U.S. EMPLOYMENT, AND U.S. WAGES.
*************************************************************************
*THE DIMENSIONING AREA FOR THE PROGRAM
      CHARACTER*4 SIC(7000),SIC34(7000),SIC12(7000),SIC4(7000)
      CHARACTER*4 USCODE(1148)
      CHARACTER*2 CNAMES(11),CNAME2
      CHARACTER*12 FN
      DIMENSION NVEC(12), STACO(7000), C(7000,13)
      DIMENSION ONEPOS(10), TWOPOS(100), THRPOS(1100)
      REAL*4 TEMP(7000), PAY(7000), EMP(7000)
      REAL*4 EMPMAX(7000), EMPMIN(7000)
      REAL*4 Y(7000), Z(7000), W(7000)
      REAL*4 EMPFIN(1148), PAYFIN(1148)
      REAL*4 USEMP(1148), USPAY(1148)
```

```
      REAL*4 EMPIO(539), PAYIO(539), WAITIO(539)
      INTEGER CNUM(10)
      DATA CNAMES/'W1','W2','C1','C2','C3','C4','E1','E2','E3','E4'
     C           ,'US'/
      DATA CNUM/11,12,5,10,5,6,5,7,11,2/
*************************************************************************
*READ IN VARIABLES FROM THE U.S. COUNTY BUS. PATTERNS DATA FILE
* ONLY THE FIRST COLUMN (THE LIST OF THE 1148 SIC CODES) IS NEEDED HERE
*************************************************************************
C     OPEN (2,FILE='CBP4US2')
      DO 877 J=1,1148
      READ(2,878) USCODE(J),EMPFIN(J),PAYFIN(J)
  878 FORMAT(6X,A4,F11.0,3X,F14.0)
  877 CONTINUE
*************************************************************************
*PROGRAM AREA FOR INTERACTIVE INPUT OF STUDY AREA IDENTITY.  ONCE THE
* STUDY AREA NAME IS ENTERED, THE NUMBER OF COUNTIES IS DETERMINED (NC).
*************************************************************************
      WRITE(6,556)
556   FORMAT(' ENTER THE COASTAL AREA CODE:')
      READ (5,557) CNAME2
557   FORMAT(A2)
      DO 558 I=1,11
      IF (CNAMES(I).EQ.CNAME2)  GOTO 560
558   CONTINUE
      WRITE (6,559)
559   FORMAT (' INVALID COASTAL AREA CODE')
      STOP
*NC IS THE NUMBER OF COUNTIES IN THE FILE (STUDY AREA) BEING PROCESSED
560   ISECTR=I
      IF (I.EQ.11) GOTO 960
      NC=CNUM(I)
      WRITE (6,*) 'NUMBER OF COUNTIES=',NC
*************************************************************************
*READ IN VARIABLES FROM THE STUDY AREA DATA FILE, DETERMINE THE
* NUMBER OF CODES WITHIN EACH COUNTY, PLACE THOSE CODE COUNTS
* IN THE ARRAY NVEC, AND COUNT THE TOTAL NUMBER OF INDUSTRIES IN THE
* STUDY AREA (NOBS).
*************************************************************************
C887   FORMAT (A4,A2)
      J=1
      NSUM=0
      DO 888 I=1,7000
      READ (4,889,END=555) STACO(I), SIC(I), TEMP(I), PAY(I),
     C             (C(I,K),K=1,13)
  889 FORMAT(F5.0,1X,A4,2X,G12.0,14X,G12.0,G7.0,2G6.0,G5.0,9G4.0)
      IF (I.EQ.1) GO TO 888
      IF (STACO(I).NE.STACO(I-1)) THEN
         IF (J.EQ.1) THEN
             NVEC(1)=I-1
             NSUM=NSUM+NVEC(1)
             J=J+1
           ELSE
             NVEC(J)=I-1-NSUM
```

```
            NSUM=NSUM+NVEC(J)
            J=J+1
         END IF
      END IF
  888 CONTINUE
555   CONTINUE
*NOBS IS THE TOTAL NUMBER OF CODES IN ALL THE COUNTIES
      NOBS=I-1
      WRITE (6,*) 'NUMBER OF OBSERVATIONS=',NOBS
      NVEC(J)=NOBS-NSUM
*NVEC CONTAINS THE NUMBER OF INDUSTRY CODES IN THE RESPECTIVE COUNTIES
**********************************************************************
*CREATE A VARIABLE, EMP, WHICH IS THE EMPLOYMENT OF AN INDUSTRY IF THAT
*TRUE VALUE WAS KNOWN OR IS THE WEIGHTED MIDPOINT OF THE FIRM CLASS
*EMPLOYMENTS IF THE TRUE EMPLOYMENT VALUE WAS SUPPRESSED
**********************************************************************
      DO 890 I=1,NOBS
      EMP(I)=TEMP(I)
      IF (TEMP(I).EQ.0.0) EMP(I)=2*C(I,1)+7*C(I,2)+14*C(I,3)+34*C(I,4)
     C    +74*C(I,5)+174*C(I,6)+374*C(I,7)+749*C(I,8)+1249*C(I,10)
     C    +1999*C(I,11)+3749*C(I,12)+7500*C(I,13)
**********************************************************************
*CREATE A VARIABLE, EMPMAX, WHICH GIVES THE MAXIMUM VALUE THAT AN
*UNKNOWN EMPLOYMENT VALUE COULD BE, I.E., THE UPPER BOUNDS OF THE
*EMPLOYMENT RANGES.  WE WILL USE THIS LATER TO SERVE AS AN UPPER
*BOUND FOR THE BALANCED MIDPOINT VALUES
**********************************************************************
      EMPMAX(I)=TEMP(I)
      IF (TEMP(I).EQ.0.0) EMPMAX(I)=4*C(I,1)+9*C(I,2)+19*C(I,3)+49*
     C  C(I,4)+99*C(I,5)+299*C(I,6)+499*C(I,7)+999*C(I,8)+1499*C(I,10)
     C  +2499*C(I,11)+4999*C(I,12)+999999*C(I,13)
**********************************************************************
*CREATE A VARIABLE, EMPMIN, WHICH GIVES THE MINIMUM VALUE THAT AN
*UNKNOWN EMPLOYMENT VALUE COULD BE, I.E., THE LOWER BOUNDS OF THE
*EMPLOYMENT RANGES.  WE WILL USE THIS LATER TO SERVE AS A LOWER
*BOUND FOR THE BALANCED MIDPOINT VALUES*
**********************************************************************
      EMPMIN(I)=TEMP(I)
      IF (TEMP(I).EQ.0.0) EMPMIN(I)=1*C(I,1)+5*C(I,2)+10*C(I,3)+20*
     C  C(I,4)+50*C(I,5)+100*C(I,6)+250*C(I,7)+500*C(I,8)+1000*C(I,10)
     C  +1500*C(I,11)+2500*C(I,12)+5000*C(I,13)
  890 CONTINUE
**********************************************************************
*INITIALIZE VECTORS WHICH WILL EVENTUALLY CONTAIN THE KNOWN (Y) AND
*MIDPOINT (Z) EMPLOYMENT NUMBERS, AND THE IMPLICIT WAGE NUMBERS
**********************************************************************
      DO 901 I=1,NOBS
      Y(I)=0
      Z(I)=0
      W(I)=0
**********************************************************************
*NOW MAKE SUBSTRINGS OF THE SIC VARIABLES.  THESE ARE NECESSARY FOR
```

```
* THE PROGRAM CODE THAT WILL BALANCE THE EMPLOYMENT TOTALS
**********************************************************************
      SIC34(I)=SIC(I) (3:4)
      SIC12(I)=SIC(I) (1:2)
      SIC4(I)=SIC(I) (4:4)
  901 CONTINUE
*&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
*&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
*THE CONTROL LOOP FOR THE COUNTIES
*&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
*&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&
*NN IS THE LAST INDUSTRY CODE IN THE COUNTY CURRENTLY BEING ANALYZED IN
* THE LOOP
*N IS THE FIRST INDUSTRY CODE (I.E. THE COUNTY TOTAL) IN THE COUNTY
* CURRENTLY BEING ANALYZED IN THE LOOP
**********************************************************************
      NN=0
      DO 902 II=1,NC
      NN=NN+NVEC(II)
      N=NN-NVEC(II)+1
**********************************************************************
*INITIALIZE VECTORS WHICH WILL EVENTUALLY CONTAIN THE POSITIONS OF
*THE VARIOUS SIC CODES PRESENT IN A GIVEN COUNTY
**********************************************************************
      DO 903 I=1,10
      ONEPOS(I)=0
  903 CONTINUE
      DO 904 I=1,100
      TWOPOS(I)=0
  904 CONTINUE
      DO 905 I=1,1100
      THRPOS(I)=0
  905 CONTINUE
**********************************************************************
**********************************************************************
*NOW ALLOCATE THE KNOWN EMPLOYMENT VALUES TO THE Y VECTOR AND THE
*MIDPOINT EMPLOYMENT VALUES TO THE Z VECTOR
      DO 906 I=N,NN
      IF (EMP(I).EQ.TEMP(I)) THEN
            Y(I)=EMP(I)
         ELSE
            Z(I)=EMP(I)
      END IF
  906 CONTINUE
**********************************************************************
*MAKE THE ONE DIGIT EMPLOYMENT VALUES BALANCE TO THE COUNTY TOTAL
**********************************************************************
      SUMZC=0
      SUMYC=0
      SUMXP=0
      SUMZF=0
      DO 907 I=N,NN
*CONFINE ATTENTION TO ONE DIGIT INDUSTRIES
*CREATE COUNTY SUMS OF KNOWN ONE DIGIT EMPLOYMENT, MIDPOINT
```

```
* ONE DIGIT EMPLOYMENT, AND KNOWN ONE DIGIT WAGES
      IF((SIC(I).NE.'----').AND.(SIC34(I).EQ.'--')) THEN
          SUMZC=SUMZC+Z(I)
          SUMYC=SUMYC+Y(I)
          SUMXP=SUMXP+PAY(I)
       END IF
  907 CONTINUE
*N IS THE POSITION OF THE COUNTY TOTAL.
*RC IS THE DISCREPANCY BETWEEN THE COUNTY EMPLOYMENT TOTAL AND THE SUM
* OF THE ONE DIGIT KNOWN EMPLOYMENTS PLUS THE ONE DIGIT MIDPOINT
* EMPLOYMENTS.
      RC=Y(N)+Z(N)-SUMZC-SUMYC
*RW IS THE DISCREPANCY BETWEEN THE COUNTY WAGE TOTAL AND THE SUM OF THE
* KNOWN ONE DIGIT WAGES.
      RW=PAY(N)-SUMXP
*CHECK WHETHER ANY ONE DIGIT VALUES WERE MIDPOINTS.  IF NONE WERE, THEN
* THERE IS NO MIDPOINTS IN NEED OF BALANCING.
      IF (SUMZC.EQ.0) GO TO 910
*ALLOCATE THE EMP DISCREPANCY (RC) TO THE ONE DIGIT MIDPOINT EMP'S
      DO 908 I=N,NN
      IF ((SIC(I).NE.'----').AND.(SIC34(I).EQ.'--').AND.(Z(I).NE.0))
     C     THEN
          Z(I)=Z(I)*(1.0+(RC/SUMZC))
      IF (Z(I).GT.EMPMAX(I))  Z(I)=EMPMAX(I)
      IF ((Z(I).LT.EMPMIN(I)).AND.(Z(I).NE.0)) Z(I)=EMPMIN(I)
*CREATE THE SUM OF THE BALANCED ONE DIGIT EMPLOYMENT MIDPOINT VALUES
      SUMZF=SUMZF+Z(I)
      END IF
  908 CONTINUE
*ALLOCATE THE WAGE DISCREPANCY (RW) TO THE UNKNOWN ONE DIGIT WAGES
* IN PROPORTION TO THE BALANCED MIDPOINT EMPLOYMENT VALUES FOR THOSE
* ONE DIGIT INDUSTRIES
      IF (SUMZF.EQ.0) GO TO 910
      DO 909 I=N,NN
      IF ((SIC(I).NE.'----').AND.(SIC34(I).EQ.'--')
     C     .AND.(Z(I).NE.0)) W(I)=(Z(I)/SUMZF)*RW
  909 CONTINUE
*************************************************************************
*MAKE THE TWO DIGIT VALUES BALANCE TO THE RESPECTIVE ONE DIGIT VALUES*
*************************************************************************
*ASSIGN THE POSITIONS OF THE ONE DIGIT VALUES TO THE VECTOR ONEPOS*
  910 M=0
      DO 911 I=N,NN
      IF((SIC(I).NE.'----').AND.(SIC34(I).EQ.'--')) THEN
      M=M+1
      ONEPOS(M)=I
      END IF
  911 CONTINUE
*DO THE ALLOCATION AND BALANCING WITHIN EACH ONE DIGIT INDUSTRY (1 TO M)
      DO 912 L=1,M
      LLL=ONEPOS(L)
      IF (L.EQ.M) THEN
```

```
          LLLL=NN
        ELSE
          LLLL=ONEPOS(L+1)-1
      END IF
      SUMZC=0
      SUMYC=0
      SUMXP=0
      SUMZF=0
      DO 913 I=LLL,LLLL
      IF((SIC34(I).EQ.'00').OR.(SIC4(I).EQ.'/')) THEN
          SUMZC=SUMZC+Z(I)
          SUMYC=SUMYC+Y(I)
          SUMXP=SUMXP+PAY(I)
      END IF
  913 CONTINUE
      RC=Y(LLL)+Z(LLL)-SUMZC-SUMYC
      RW=PAY(LLL)+W(LLL)-SUMXP
*CHECK IF ANY TWO DIGIT VALUES IN THE ONE DIGIT GROUP ARE MIDPOINTS
*IF THERE ARE NONE, THEN LEAVE THE LOOP FOR THIS ONE DIGIT GROUP
      IF (SUMZC.EQ.0) GO TO 912
      DO 914 I=LLL,LLLL
      IF((SIC34(I).EQ.'00').OR.(SIC4(I).EQ.'/')) THEN
             Z(I)=Z(I)*(1.0+(RC/SUMZC))
      IF (Z(I).GT.EMPMAX(I))  Z(I)=EMPMAX(I)
      IF ((Z(I).LT.EMPMIN(I)).AND.(Z(I).NE.0)) Z(I)=EMPMIN(I)
      SUMZF=SUMZF+Z(I)
      END IF
  914 CONTINUE
      IF (SUMZF.EQ.0) GO TO 912
      DO 915 I=LLL,LLLL
      IF((SIC34(I).EQ.'00').OR.(SIC4(I).EQ.'/')) W(I)=(Z(I)/SUMZF)*RW
  915 CONTINUE
  912 CONTINUE
*************************************************************************
*MAKE THE THREE DIGIT VALUES BALANCE TO THE RESPECTIVE TWO DIGIT VALUES
*************************************************************************
*ASSIGN THE POSITIONS OF THE TWO DIGIT VALUES TO THE VECTOR TWOPOS*
      M=0
      DO 916 I=N,NN
      IF (SIC34(I).EQ.'00') THEN
               M=M+1
               TWOPOS(M)=I
      END IF
  916 CONTINUE
*NOW DO THE ALLOCATION AND BALANCING*
      DO 917 L=1,M
      LLL=TWOPOS(L)
      IF (L.EQ.M) THEN
           LLLL=NN
         ELSE
           LLLL=TWOPOS(L+1)
      END IF
      SUMZC=0
      SUMYC=0
```

```
      SUMXP=0
      SUMZF=0
      DO 918 I=LLL,LLLL
      IF((SIC34(I).NE.'00').AND.(SIC4(I).EQ.'0')) THEN
      SUMZC=SUMZC+Z(I)
      SUMYC=SUMYC+Y(I)
      SUMXP=SUMXP+PAY(I)
      END IF
  918 CONTINUE
      RC=Y(LLL)+Z(LLL)-SUMZC-SUMYC
      RW=PAY(LLL)+W(LLL)-SUMXP
*CHECK IF ANY THREE DIGIT VALUES IN THE TWO DIGIT GROUP ARE MIDPOINTS
*IF THERE ARE NONE, THEN LEAVE THE LOOP FOR THIS TWO DIGIT GROUP
      IF (SUMZC.EQ.0) GO TO 917
      DO 919 I=LLL,LLLL
      IF((SIC34(I).NE.'00').AND.(SIC4(I).EQ.'0')) THEN
            Z(I)=Z(I)*(1.0+(RC/SUMZC))
      IF (Z(I).GT.EMPMAX(I))  Z(I)=EMPMAX(I)
      IF ((Z(I).LT.EMPMIN(I)).AND.(Z(I).NE.0)) Z(I)=EMPMIN(I)
      SUMZF=SUMZF+Z(I)
      END IF
  919 CONTINUE
      IF (SUMZF.EQ.0) GO TO 917
      DO 920 I=LLL,LLLL
      IF((SIC34(I).NE.'00').AND.(SIC4(I).EQ.'0')) W(I)=(Z(I)/SUMZF)*RW
  920 CONTINUE
  917 CONTINUE
**************************************************************************
*MAKE FOUR DIGIT VALUES BALANCE TO THE RESPECTIVE THREE DIGIT VALUES*
**************************************************************************
*ASSIGN THE POSITIONS OF THE THREE DIGIT VALUES TO THE VECTOR THRPOS*
      M=0
      DO 921 I=N,NN
      IF ((SIC34(I).NE.'00').AND.(SIC4(I).EQ.'0')) THEN
               M=M+1
               THRPOS(M)=I
      END IF
  921 CONTINUE
*NOW DO THE ALLOCATION AND BALANCING*
      DO 922 L=1,M
      LLL=THRPOS(L)
      IF (L.EQ.M) THEN
           LLLL=NN
         ELSE
           LLLL=THRPOS(L+1)
      END IF
      SUMZC=0
      SUMYC=0
      SUMXP=0
      SUMZF=0
      DO 923 I=LLL,LLLL
      IF((SIC4(I).NE.'0').AND.(SIC34(I).NE.'--').AND.(SIC4(I).NE.'/'))
```

```
     C    THEN
      SUMZC=SUMZC+Z(I)
      SUMYC=SUMYC+Y(I)
      SUMXP=SUMXP+PAY(I)
      END IF
  923 CONTINUE
      RC=Y(LLL)+Z(LLL)-SUMZC-SUMYC
      RW=PAY(LLL)+W(LLL)-SUMXP
*CHECK IF ANY FOUR DIGIT VALUES IN THE THREE DIGIT GROUP ARE MIDPOINTS
*IF THERE ARE NONE, THEN LEAVE THE LOOP FOR THIS THREE DIGIT GROUP
      IF (SUMZC.EQ.0) GO TO 922
      DO 924 I=LLL,LLLL
      IF((SIC4(I).NE.'0').AND.(SIC34(I).NE.'--').AND.(SIC4(I).NE.'/'))
     C    THEN
            Z(I)=Z(I)*(1.0+(RC/SUMZC))
      IF (Z(I).GT.EMPMAX(I))  Z(I)=EMPMAX(I)
      IF ((Z(I).LT.EMPMIN(I)).AND.(Z(I).NE.0)) Z(I)=EMPMIN(I)
      SUMZF=SUMZF+Z(I)
      END IF
  924 CONTINUE
      IF (SUMZF.EQ.0) GO TO 922
      DO 925 I=LLL,LLLL
      IF((SIC4(I).NE.'0').AND.(SIC34(I).NE.'--').AND.(SIC4(I).NE.'/'))
     C    W(I)=(Z(I)/SUMZF)*RW
  925 CONTINUE
  922 CONTINUE
  902 CONTINUE
*****************************************************************************
*****************************************************************************
*NOW CREATE THE VECTOR OF FINAL EMP VALUES (KNOWN AND BALANCED MIDPTS)
* AND FINAL WAGE VALUES.
*****************************************************************************
      DO 930 I=1,NOBS
      EMP(I)=Y(I)+Z(I)
      PAY(I)=PAY(I)+W(I)
  930 CONTINUE
*****************************************************************
*GETTING THE STUDY AREA INDUSTRY TOTALS OF EMPLOYMENT AND WAGES.
* NOTE THAT THE INDUSTRIES NOT PRESENT IN THE STUDY AREA WILL GET
*  ZERO VALUES FOR EMPLOYMENT AND WAGES
*****************************************************************
*****************************************************************
*ZERO OUT THE FINAL SUM POSITIONS
      DO 940 J=1,1148
      EMPFIN(J)=0.0
      PAYFIN(J)=0.0
  940 CONTINUE
*SUM THE INDUSTRIES ACROSS STUDY AREA COUNTIES.
      DO 941 J=1,1148
      DO 941 I=1,NOBS
      IF (SIC(I).EQ.USCODE(J)) THEN
            EMPFIN(J)=EMPFIN(J)+EMP(I)
            PAYFIN(J)=PAYFIN(J)+PAY(I)
      END IF
```

```
  941 CONTINUE
*CONVERT ALL NEGATIVES (QUITE RARE) TO POSITIVES
      DO 950 J=1,1148
      IF (EMPFIN(J).LT.0) EMPFIN(J)=(-1)*EMPFIN(J)
      IF (PAYFIN(J).LT.0) PAYFIN(J)=(-1)*PAYFIN(J)
  950 CONTINUE
*************************************************************************
*NOW CALL THE BRIDGE SUBROUTINE WHICH WILL COLLAPSE THE 1148 SIC
* EMPLOYMENTS AND WAGES FOR THE STUDY AREA INTO THE 520 ODD I/O CODES
* FOR THE STUDY AREA
*************************************************************************
960   CALL BRIDGE (EMPFIN,EMPIO)
      CALL BRIDGE (PAYFIN,PAYIO)
      CALL PATCH  (EMPIO ,PAYIO ,ISECTR)
*************************************************************************
*NOW CALL THE WEIGHT SUBROUTINE WHICH WILL COMPUTE THE "INDUSTRY
* WEIGHTS" FOR THE 520 ODD I/O CODES (EMPLOYMENT RATIOS)
*************************************************************************
      CALL WEIGHT (EMPIO ,WAITIO)
      ICOL = 3
      IROW = 539
      ITYPE= 5
      WRITE (8) IROW,ICOL,ITYPE
      WRITE (8) (EMPIO(I), I=1,539),(PAYIO(I),I=1,539),
     *          (WAITIO(I),I=1,539)
       WRITE (9,975) (I,EMPIO(I),PAYIO(I),WAITIO(I),I=1,539)
 975   FORMAT (I6,2F12.3,F12.6)
*************************************************************************
*WRITING OUT OPTIONAL RESULTS WHILE PROGRAM WAS BEING DEVELOPED
C     DO 942 J=1,1148
C     WRITE (9,943) USCODE(J), EMPFIN(J), PAYFIN(J)
C 943 FORMAT(3X,A4,F20.5,F18.3)
C 942 CONTINUE
      STOP
      END
*************************************************************************
*************************************************************************
*THE SUBROUTINE OF THE BRIDGE BETWEEN THE 1148 SIC CODES AND THE
* 520 ODD I/O CODES.
*************************************************************************
*************************************************************************
      SUBROUTINE  BRIDGE (B,D)
      REAL*4 B(1148),D(539)
      D(18)=B(12)
      D(19)=B(13)
      D(20)=B(4)+B(5)+B(7)
      D(21)=B(11)
      D(22)=B(17)+B(24)
      D(23)=B(18)
      D(24)=B(19)+B(20)+B(23)+B(25)/(3)+B(26)
      D(25)=B(32)+B(33)+B(36)+B(37)
      D(26)=B(39)+B(40)
```

```
 D(27)=B(46)+B(47)
 D(28)=B(51)
 D(29)=B(54)
 D(30)=B(70)+B(68)/(3)
 D(31)=B(60)
 D(32)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(33)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(34)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(35)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(36)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(37)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(38)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(39)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(40)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(41)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(93)/(28)+B(95)/(29)+B(96)/(45)
C       +B(97)/(2)+B(100)/(30)+B(101)/(31)+B(102)/(15)+B(103)/(32)
C       +B(104)/(38)
 D(42)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)+B(102)/(15)
C       +B(103)/(32)+B(104)/(38)
 D(43)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(44)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(45)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
```

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C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(46)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(47)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)
C       /(32)+B(104)/(38)
 D(48)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(49)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(50)=B(83)/(38)+B(87)/(45)+B(99)/(34)
 D(51)=B(83)/(38)+B(87)/(45)+B(99)/(34)
 D(52)=B(83)/(38)+B(85)/(28)+B(87)/(45)+B(89)/(31)+B(93)/(28)+B(94)
C       /(26)+B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)
C       /(31)+B(103)/(32)+B(104)/(38)
 D(53)=B(83)/(38)+B(85)/(28)+B(87)/(45)+B(89)/(31)+B(93)/(28)+B(94)
C       /(26)+B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)
C       /(31)+B(103)/(32)+B(104)/(38)
 D(54)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(101)/(31)
C       +B(103)/(32)
 D(55)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(97)/(2)+B(99)/(34)
C       +B(101)/(31)+B(103)/(32)
 D(56)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(101)/(31)
C       +B(103)/(32)
 D(57)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(101)/(31)
C       +B(103)/(32)
 D(58)=B(81)/(2)+B(96)/(45)
 D(59)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(97)/(2)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(60)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(93)/(28)+B(94)/(26)+B(95)/(29)+B(96)/(45)
C       +B(99)/(34)+B(100)/(30)+B(101)/(31)+B(103)/(32)+B(104)/(38)
 D(61)=B(42)
 D(62)=B(25)/(3)+B(43)/(3)+B(68)
 D(63)=B(25)/(3)+B(68)/(3)
 D(64)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(101)/(31)
C       +B(102)/(15)+B(103)/(32)+B(104)/(38)
 D(65)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(87)/(45)+B(89)/(31)+B(96)
C       /(45)
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 D(66)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(87)/(45)+B(89)/(31)+B(96)
C       /(45)+B(99)/(34)+B(100)/(30)
 D(67)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(104)/(38)
 D(68)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)
C       +B(96)/(45)+B(100)/(30)+B(101)/(31)+B(104)/(38)
 D(69)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(100)/(30)+B(101)/(31)+B(103)/(32)
C       +B(104)/(38)
 D(70)=B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)/(31)+B(90)/(26)+B(91)
C       /(22)+B(93)/(28)+B(94)/(26)+B(95)/(29)+B(96)/(45)+B(100)
C       /(30)+B(101)/(31)+B(104)/(38)
 D(71)=B(77)/(30)+B(78)/(31)+B(85)/(28)+B(86)/(26)+B(87)/(45)+B(89)
C       /(31)+B(90)/(26)+B(93)/(28)+B(95)/(29)+B(96)/(45)+B(100)
C       /(30)+B(101)/(31)+B(104)/(38)
 D(72)=B(83)/(38)+B(87)/(45)+B(95)/(29)+B(96)/(45)+B(99)/(34)
C       +B(103)/(32)+B(104)/(38)
 D(73)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(74)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(75)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(76)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(77)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(78)=B(83)/(38)+B(87)/(45)+B(96)/(45)
 D(79)=B(83)/(38)+B(87)/(45)+B(96)/(45)+B(99)/(34)+B(103)/(32)
C       +B(104)/(38)
 D(80)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(85)/(28)+B(86)/(26)+B(87)
C       /(45)+B(89)/(31)+B(90)/(26)+B(91)/(22)+B(93)/(28)+B(94)/(26)
C       +B(95)/(29)+B(96)/(45)+B(99)/(34)+B(100)/(30)+B(103)/(32)
C       +B(104)/(38)
 D(81)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(87)/(45)+B(89)/(31)+B(96)
C       /(45)+B(99)/(34)+B(100)/(30)+B(103)/(32)+B(104)/(38)
 D(82)=B(81)/(2)+B(96)/(45)
 D(83)=B(44)
 D(84)=B(77)/(30)+B(78)/(31)+B(83)/(38)+B(104)/(38)
 D(85)=B(626)
 D(86)=B(495)
 D(87)=B(631)
 D(88)=B(496)
 D(89)=B(494)
 D(90)=B(497)
 D(91)=B(109)
 D(92)=B(110)
 D(93)=B(111)
 D(94)=B(112)
 D(95)=B(114)
 D(96)=B(115)
 D(97)=B(116)
 D(98)=B(117)
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D(99)=B(118)
D(100)=B(158)
D(101)=B(120)
D(102)=B(121)
D(103)=B(122)
D(104)=B(123)
D(105)=B(159)
D(106)=B(124)
D(107)=B(125)
D(108)=B(127)
D(109)=B(128)
D(110)=B(130)
D(111)=B(132)
D(112)=B(133)
D(113)=B(129)
D(114)=B(131)
D(115)=B(135)
D(116)=B(136)
D(117)=B(138)+B(139)+B(140)
D(118)=B(141)
D(119)=B(142)
D(120)=B(143)
D(121)=B(151)
D(122)=B(152)
D(123)=B(153)
D(124)=B(154)
D(125)=B(155)
D(126)=B(156)
D(127)=B(145)
D(128)=B(146)
D(129)=B(147)
D(130)=B(148)
D(131)=B(160)
D(132)=B(149)
D(133)=B(161)
D(134)=B(162)
D(135)=B(163)
D(136)=B(165)
D(137)=B(166)
D(138)=B(167)
D(139)=B(168)
D(140)=B(170)+B(171)+B(172)+B(183)+B(184)
D(141)=B(173)
D(142)=B(185)+B(191)+B(192)+B(193)
D(143)=B(194)
D(144)=B(186)
D(145)=B(196)
D(146)=B(197)
D(147)=B(198)
D(148)=B(199)
D(149)=B(200)
D(150)=B(201)
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D(151)=B(203)
D(152)=B(202)
D(153)=B(204)
D(154)=B(175)
D(155)=B(176)
D(156)=B(177)
D(157)=B(178)
D(158)=B(181)
D(159)=B(179)+B(180)
D(160)=B(206)+B(207)+B(214)+B(219)+B(222)+B(225)+B(229)+B(230)
D(161)=B(238)
D(162)=B(239)
D(163)=B(240)
D(164)=B(241)
D(165)=B(242)
D(166)=B(243)
D(167)=B(244)
D(168)=B(245)
D(169)=B(247)
D(170)=B(249)
D(171)=B(250)
D(172)=B(251)
D(173)=B(253)
D(174)=B(254)
D(175)=B(255)+B(256)
D(176)=B(257)
D(177)=B(264)
D(178)=B(266)
D(179)=B(260)
D(180)=B(267)
D(181)=B(268)
D(182)=B(259)+B(261)
D(183)=B(271)
D(184)=B(276)
D(185)=B(275)
D(186)=B(272)
D(187)=B(273)
D(188)=B(274)
D(189)=B(278)
D(190)=B(279)
D(191)=B(280)
D(192)=B(282)
D(193)=B(283)
D(194)=B(285)
D(195)=B(286)
D(196)=B(288)
D(197)=B(289)
D(198)=B(290)
D(199)=B(293)
D(200)=B(297)
D(201)=B(306)
D(202)=B(292)
D(203)=B(294)
D(204)=B(295)
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D(205)=B(296)
D(206)=B(298)
D(207)=B(299)
D(208)=B(300)
D(209)=B(308)
D(210)=B(309)
D(211)=B(311)
D(212)=B(312)
D(213)=B(313)
D(214)=B(315)+B(316)+B(318)
D(215)=B(328)
D(216)=B(319)
D(217)=B(322)
D(218)=B(320)
D(219)=B(317)
D(220)=B(323)
D(221)=B(325)
D(222)=B(326)
D(223)=B(327)
D(224)=B(330)+B(352)+B(353)
D(225)=B(355)+B(356)
D(226)=B(357)
D(227)=B(358)
D(228)=B(351)
D(229)=B(360)
D(230)=B(361)
D(231)=B(362)
D(232)=B(363)
D(233)=B(364)
D(234)=B(336)
D(235)=B(337)
D(236)=B(338)
D(237)=B(339)
D(238)=B(340)
D(239)=B(345)
D(240)=B(346)
D(241)=B(347)
D(242)=B(348)
D(243)=B(349)
D(244)=B(366)
D(245)=B(371)
D(246)=B(372)
D(247)=B(368)
D(248)=B(369)
D(249)=B(374)
D(250)=B(375)
D(251)=B(376)
D(252)=B(378)
D(253)=B(379)
D(254)=B(377)
D(255)=B(381)
D(256)=B(382)
```

```
D(257)=B(385)+B(386)+B(387)
D(258)=B(384)
D(259)=B(388)
D(260)=B(389)
D(261)=B(391)
D(262)=B(392)
D(263)=B(393)
D(264)=B(395)+B(398)+B(399)
D(265)=B(397)
D(266)=B(400)
D(267)=B(402)
D(268)=B(403)
D(269)=B(404)
D(270)=B(405)
D(271)=B(407)
D(272)=B(408)
D(273)=B(409)
D(274)=B(410)
D(275)=B(411)
D(276)=B(413)
D(277)=B(414)
D(278)=B(415)
D(279)=B(416)
D(280)=B(417)
D(281)=B(418)
D(282)=B(420)
D(283)=B(421)
D(284)=B(422)
D(285)=B(423)
D(286)=B(424)
D(287)=B(425)
D(288)=B(426)
D(289)=B(429)
D(290)=B(430)
D(291)=B(431)
D(292)=B(432)
D(293)=B(433)
D(294)=B(434)
D(295)=B(485)
D(296)=B(458)
D(297)=B(459)
D(298)=B(440)
D(299)=B(441)
D(300)=B(442)
D(301)=B(443)
D(302)=B(444)
D(303)=B(445)
D(304)=B(447)
D(305)=B(448)+B(449)+B(450)
D(306)=B(451)
D(307)=B(452)
D(308)=B(454)
D(309)=B(455)
D(310)=B(456)
```

```
D(311)=B(486)
D(312)=B(462)
D(313)=B(463)
D(314)=B(470)
D(315)=B(471)
D(316)=B(472)
D(317)=B(474)
D(318)=B(475)
D(319)=B(476)
D(320)=B(477)
D(321)=B(478)
D(322)=B(479)
D(323)=B(480)
D(324)=B(481)
D(325)=B(487)
D(326)=B(488)
D(327)=B(489)
D(328)=B(465)
D(329)=B(466)
D(330)=B(467)
D(331)=B(468)
D(332)=B(491)
D(333)=B(492)
D(334)=B(501)+B(502)
D(335)=B(499)
D(336)=B(500)+B(504)
D(337)=B(503)
D(338)=B(505)
D(339)=B(508)
D(340)=B(509)
D(341)=B(511)
D(342)=B(512)
D(343)=B(514)
D(344)=B(515)
D(345)=B(516)
D(346)=B(517)
D(347)=B(518)
D(348)=B(519)
D(349)=B(520)
D(350)=B(522)
D(351)=B(523)
D(352)=B(524)+B(525)
D(353)=B(526)
D(354)=B(527)
D(355)=B(528)
D(356)=B(530)
D(357)=B(531)
D(358)=B(532)
D(359)=B(533)
D(360)=B(534)
D(361)=B(535)
D(362)=B(537)+B(539)
```

```
D(363)=B(538)
D(364)=B(540)
D(365)=B(541)
D(366)=B(542)+B(544)
D(367)=B(543)
D(368)=B(545)
D(369)=B(548)
D(370)=B(549)
D(371)=B(550)
D(372)=B(547)+B(551)
D(373)=B(559)
D(374)=B(560)
D(375)=B(553)
D(376)=B(554)
D(377)=B(555)
D(378)=B(556)
D(379)=B(557)
D(380)=B(639)
D(381)=B(563)
D(382)=B(564)
D(383)=B(566)
D(384)=B(567)
D(385)=B(568)
D(386)=B(569)
D(387)=B(570)
D(388)=B(572)
D(389)=B(573)
D(390)=B(574)
D(391)=B(575)
D(392)=B(576)
D(393)=B(577)
D(394)=B(578)
D(395)=B(580)
D(396)=B(583)+B(584)+B(585)+B(586)
D(397)=B(581)+B(582)
D(398)=B(588)
D(399)=B(589)
D(400)=B(591)
D(401)=B(592)
D(402)=B(594)+B(595)+B(596)
D(403)=B(597)
D(404)=B(598)+B(599)+B(600)+B(601)+B(602)
D(405)=B(604)
D(406)=B(605)
D(407)=B(606)
D(408)=B(607)
D(409)=B(608)
D(410)=B(612)
D(411)=B(614)
D(412)=B(611)
D(413)=B(613)
D(414)=B(617)
D(415)=B(618)+B(627)
D(416)=B(619)+B(628)
```

```
D(417)=B(621)
D(418)=B(622)
D(419)=B(623)
D(420)=B(624)
D(421)=B(630)
D(422)=B(263)
D(423)=B(615)
D(424)=B(632)
D(425)=B(634)
D(426)=B(637)+B(638)+B(640)
D(427)=B(636)
D(428)=B(643)
D(429)=B(644)
D(430)=B(645)
D(431)=B(648)
D(432)=B(641)
D(433)=B(646)
D(434)=B(647)
D(435)=B(651)
D(436)=B(653)
D(437)=B(652)
D(438)=B(665)
D(439)=B(654)
D(440)=B(657)
D(441)=B(656)
D(442)=B(658)
D(443)=B(660)
D(444)=B(661)
D(445)=B(662)
D(446)=B(663)
D(447)=B(666)
D(448)=B(667)
D(449)=B(668)
D(450)=B(670)
D(451)=B(673)
D(452)=B(672)
D(453)=B(671)
D(454)=B(674)
D(455)=B(677)+B(741)
D(456)=B(683)
D(457)=B(699)
D(458)=B(713)
D(459)=B(729)
D(460)=B(732)
D(461)=B(736)+B(740)+B(742)
D(462)=B(739)
D(463)=B(745)+B(747)+B(750)
D(464)=B(749)
D(465)=B(753)+B(757)
D(466)=B(755)+B(758)
D(467)=B(760)
D(468)=B(762)+B(763)+B(765)+B(759)
```

```
 D(469)=B(769)+B(809)
 D(470)=B(850)+B(856)+B(860)+B(870)+B(879)+B(888)+B(902)+B(1039)
C       +B(1105)
 D(471)=B(931)
 D(472)=B(937)+B(973)+B(974)+B(977)+B(978)
 D(473)=B(946)
 D(474)=B(951)
 D(475)=B(961)
 D(476)=0
 D(477)=B(963)+B(970)+B(78)/(31)
 D(478)=B(984)
 D(479)=B(992)+B(1005)
 D(480)=B(1006)
 D(481)=B(1002)+B(1007)
 D(482)=B(1060)
 D(483)=B(1064)+B(1065)
 D(484)=B(1003)+B(1004)
 D(485)=B(1066)
 D(486)=B(1020)
 D(487)=B(1025)
 D(488)=B(1029)
 D(489)=B(1034)+B(1035)+B(1040)
 D(490)=B(1036)
 D(491)=B(1037)
 D(492)=B(1017)+B(1018)+B(1038)
 D(493)=B(1014)+B(1016)+B(1019)+B(1024)+B(1041)
 D(494)=B(1009)
 D(495)=B(1114)
 D(496)=B(1139)
 D(497)=B(1141)+B(1142)
 D(498)=B(898)
 D(499)=B(1043)
 D(500)=B(1050)+B(1058)
 D(501)=B(1047)+B(1057)
 D(502)=B(1070)
 D(503)=B(1084)
 D(504)=B(1087)
 D(505)=B(1091)
 D(506)=B(1092)
 D(507)=B(1097)
 D(508)=B(1083)+B(1094)+B(1095)+B(1096)+B(1098)
 D(509)=B(1100)+B(1101)+B(1102)+B(1104)
 D(510)=B(1108)
 D(511)=B(1107)
 D(512)=B(6)+B(1106)+B(1109)+B(1112)+B(1113)
 D(513)=B(1117)
 D(514)=B(1118)
 D(515)=B(1119)+B(1120)+B(1122)
 D(516)=B(1131)+B(1132)
 D(517)=B(1133)+B(1134)
 D(518)=B(1136)
 D(519)=B(1127)+B(1135)+B(1137)+B(1140)+B(976)
 D(520)=B(1124)/(3)
 D(521)=B(1124)/(3)
```

```
      D(522)=B(1125)
      D(523)=B(1124)/(3)
      D(524)=B(710)
      D(539)=B(1)
      RETURN
      END
C*************************************************************************
C*************************************************************************
C*THE SUBROUTINE TO COMPUTE THE "INDUSTRY WEIGHTS" OF THE 520 ODD I/O
C* CODES (EMPLOYMENT RATIOS).
C*************************************************************************
C*************************************************************************
      SUBROUTINE WEIGHT(INPUT,RESULT)
      REAL*4 INPUT(539),RESULT(539),TOTALS(117),ONE
      INTEGER*4 VECTOR(538),V1(300),V2(238)
      EQUIVALENCE (VECTOR,V1),(VECTOR(301),V2)
      DATA V1    /1 ,1 ,1 ,1 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,2 ,3
     *,4 ,5 ,5 ,6 ,7 ,7 ,8 ,9 ,10 ,11 ,11 ,11 ,12 ,16 ,16 ,16 ,16 ,16
     *,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16 ,16
     *,16 ,13 ,16 ,16 ,16 ,16 ,16 ,16 ,14 ,15 ,16 ,16 ,16 ,16 ,16 ,20
     *,20 ,20 ,20 ,20 ,20 ,20 ,17 ,18 ,20 ,20 ,20 ,20 ,20 ,20 ,19 ,20
     *,21 ,21 ,21 ,21 ,21 ,21 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,22
     *,24 ,24 ,24 ,24 ,23 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24
     *,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24 ,24
     *,24 ,24 ,24 ,25 ,25 ,25 ,25 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26
     *,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26 ,26
     *,26 ,26 ,26 ,26 ,27 ,28 ,29 ,29 ,29 ,29 ,29 ,29 ,29 ,29 ,29 ,29
     *,29 ,29 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,30 ,31
     *,31 ,31 ,31 ,31 ,31 ,31 ,31 ,31 ,31 ,31 ,31 ,32 ,33 ,33 ,33 ,33
     *,33 ,33 ,33 ,33 ,33 ,33 ,33 ,33 ,33 ,33 ,33 ,34 ,35 ,35 ,35 ,35
     *,35 ,35 ,35 ,35 ,35 ,36 ,36 ,36 ,36 ,37 ,37 ,37 ,37 ,37 ,38 ,39
     *,40 ,40 ,40 ,40 ,41 ,41 ,41 ,41 ,41 ,41 ,42 ,42 ,42 ,42 ,42 ,42
     *,42 ,42 ,42 ,43 ,43 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45
     *,45 ,44 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,45 ,46 ,47 ,50 ,50
     *,48 ,49 ,50 ,50 ,50 ,53 ,53 ,53 /
      DATA V2 /53 ,53 ,53 ,53 ,51 ,53 ,52 ,53
     *,53 ,53 ,53 ,54 ,54 ,58 ,58 ,58 ,55 ,58 ,56 ,57 ,58 ,58 ,58 ,59
     *,60 ,60 ,60 ,64 ,64 ,64 ,64 ,64 ,61 ,62 ,64 ,63 ,64 ,64 ,65 ,65
     *,66 ,66 ,68 ,68 ,67 ,69 ,69 ,69 ,69 ,70 ,70 ,70 ,70 ,70 ,70 ,71
     *,71 ,71 ,71 ,71 ,71 ,72 ,72 ,72 ,72 ,72 ,72 ,72 ,73 ,73 ,74 ,74
     *,74 ,74 ,75 ,75 ,75 ,75 ,75 ,76 ,76 ,76 ,76 ,76 ,76 ,76 ,76 ,77
     *,77 ,77 ,77 ,77 ,77 ,77 ,78 ,78 ,78 ,79 ,79 ,79 ,79 ,80 ,80 ,80
     *,81 ,81 ,81 ,81 ,81 ,83 ,83 ,83 ,83 ,83 ,83 ,83 ,82 ,83 ,83 ,83
     *,83 ,83 ,83 ,83 ,84 ,84 ,84 ,84 ,84 ,84 ,84 ,84 ,84 ,84 ,85 ,85
     *,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85 ,85
     *,85 ,85 ,86 ,90 ,87 ,88 ,90 ,89 ,90 ,90 ,91 ,92 ,93 ,94 ,95 ,95
     *,96 ,97 ,98 ,100 ,100 ,99 ,100 ,101 ,101 ,102 ,103 ,103 ,103 ,103
     *,103 ,103 ,104 ,111 ,111 ,105 ,106 ,111 ,107 ,111 ,111 ,108 ,109
     *,111 ,110 ,112 ,113 ,113 ,113 ,114 ,114 ,114 ,114 ,114 ,114 ,114
     *,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115 ,115
     *,115 ,115 ,116 ,116 ,116 ,116 ,116 ,116 ,116 ,116 ,116 ,116 ,116
     *,116 ,116 ,116 ,117 /
```

```
      DATA ONE/1.0/
C
C     DETERMINE THE TOTALS FOR EACH 115 I/O CODE
      DO 10 I=1,538
10    TOTALS(VECTOR(I))=TOTALS(VECTOR(I))+INPUT(I)
C
C     CREATE THE WEIGHTS FOR THE 523 SECTORS
      DO 20 I=1,538
20    RESULT(I)=INPUT(I)/MAX(ONE,TOTALS(VECTOR(I)))
C     ALL DONE
      RETURN
      END
      SUBROUTINE PATCH(EMPIO,PAYIO,ISECTR)
      REAL*4 EMPIO(539),PAYIO(539)
C     THE FILE TO BE READ FROM IS PREDEFINED IN EXEC OR CSS FILE
C     RETRIEVE THE AGRICULTURE INFORMATION
      READ (3,10,END=100) I
10    FORMAT (/,A4)
      DO 15 I=1,17
15    READ (3,20,END=100) (EMPIO(I),J=1,ISECTR)
20    FORMAT (23X,10F8.0,F9.0)
C     RETRIEVE THE RAILROAD INFORMATION
      READ (3,20,END=100) (X,J=1,ISECTR)
      EMPIO(455)=EMPIO(455)+X
      READ (3,20,END=100) (X,J=1,ISECTR)
      PAYIO(455)=PAYIO(455)+X
C     PREPARE THE WEIGTHS FOR THE GOVERNMENT SECTORS
      EMPIO(524)=1./6.
      EMPIO(525)=1./6.
      EMPIO(526)=0.0
      EMPIO(527)=1./6.
      EMPIO(528)=1./6.
      EMPIO(529)=1./6.
      EMPIO(530)=1./6.
      DO 95 I=531,537
95    EMPIO( I )=0.0
      EMPIO(538)=1.
      PAYIO(538)=1.
      RETURN
100   WRITE (6,110)
110   FORMAT (' THERE WAS NOT SUFFICIENT DATA IN THE AGRICULTURE',/,
     *        ' AND RAILROAD DATA FILE.  THE PROGRAM IS TERMINATED.')
      STOP
      END
```

APPENDIX G

```
DISPLAY.MAC     SAM macro to display data files

GOTO TOP
*********************************************
* THIS MACRO DISPLAYS DATA FILES USED IN THE *
* IMPACT ASSEMESMENT OF THE COASTAL AREAS.   *
*********************************************
:TOP
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE


                          Data File Display Menu

Enter the file to display

   1 - Agriculture and Other wage/employment adjustment
   2 - Demographics data
   3 - Location quotients, Wage/Employment ratios, Wage/Industry Output ratios
   0 - STOP
PRINT PROMPT %2 STOP
IF %2 == STOP MACRO MMS.MAC
IF %2  == 0    MACRO MMS.MAC

IF %2 == 1 GOTO DISP3
IF %2 == 2 ASSIGN %5 DEMOGF GOTO DISP1
IF %2 == 3 ASSIGN %5 LQ     GOTO DISP1
MESSAGE MESSAGE
INVALID ENTRY '%1' : ENTER A VALUE BETWEEN 0 - 4
GOTO TOP
*************************************
* DISPLAY THE AGRICULTURE DATA FILE. *
*************************************
:DISP3
GET AGWAGE.DAT
"          AGRICULTURE AND OTHER
"        WAGE/EMPLOYMENT ADJUSTMENT
"             ($000/EMPLOYEE)
"
"COASTAL
" AREA          AGRICULTURE         OTHER
"-------        -----------      -----------
"   W1        %M1,1,11,3      %M2,1,11,3
"   W2        %M1,2,11,3      %M2,2,11,3
"   C1        %M1,3,11,3      %M2,3,11,3
"   C2        %M1,4,11,3      %M2,4,11,3
"   C3        %M1,5,11,3      %M2,5,11,3
"   C4        %M1,6,11,3      %M2,6,11,3
"   F1        %M1,7,11,3      %M2,7,11,3
"   E2        %M1,8,11,3      %M2,8,11,3
"   E3        %M1,9,11,3      %M2,9,11,3
"   E4        %M1,10,11,3      %M2,10,11,3
"
" (DATA IS DISPLAYED TRANSPOSED)
PAGE
```

```
DISPLAY.MAC     SAM macro to display data files

GOTO TOP
************************************
* ASK FOR THE COASTAL AREA          *
************************************
:DISP1
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE

                    ENTER THE COASTAL REGION TO EXAMINE

       W1  - SOUTH TEXAS COAST          W2  - NORTH TEXAS COAST
       C1  - WEST LOUISIANA COAST       C2  - CENTRAL LOUISIANA COAST
       C3  - EAST LOUISIANA COAST       C4  - MISSISSIPPI & ALABAMA COAST
       F1  - FLORIDA COAST (PENSECOLA)  E2  - NORTH CENTRAL FLORIDA COAST
       E3  - FLORIDA COAST (TAMPA)      E4  - SOUTH FLORIDA COAST
       STOP

MACRO PROMPT %0 STOP
IF %0 == STOP EXIT
GET %5%0.DAT
IF %5 == LQ GOTO LQ
"
"
"
"MMS DEMOGRAPHIC MODEL STANDARD VALUES FOR COASTAL AREA %0
"-------------------------------------------------------------------------
"  ITEM                  OFF/ON SHORE   OFF/ON SHORE   TYPE I        TYPE II
"                        CONSTRUCTION   MAINT & REPAIR
"-------------------------------------------------------------------------
"WORKER ORIGIN:
"  LOCAL                 %M1,1,12,1 %M1,2,12,1 %M1,3,12,1 %M1,4,12,1
"  COMMUTER              %M2,1,12,1 %M2,2,12,1 %M2,3,12,1 %M2,4,12,1
"  RELOCATING            %M3,1,12,1 %M3,2,12,1 %M3,3,12,1 %M3,4,12,1
"
"PERCENT OF RELOCATING
"WORKERS WITH DEPENDENTS %M4,1,12,1 %M4,2,12,1 %M4,3,12,1 %M4,4,12,1
"
"PERCENT OF RELOCATING
"WORKERS WHO ARE MALE    %M5,1,12,1 %M5,2,12,1 %M5,3,12,1 %M5,4,12,1
"
"AVERAGE NUMBER OF
"CHILDREN PER RELOCATING
"WORKER WITH DEPENDENTS  %M6,1,12,1 %M6,2,12,1 %M6,3,12,1 %M6,4,12,1
"
"MULTIPLE JOBHOLDER
"ADJUSTMENT FACTOR       %M7,1,12,1 %M7,2,12,1 %M7,3,12,1 %M7,4,12,1
"
"
"THESE VALUES ARE THE CURRENT SETTINGS.  THE SUGGESTED RANGES FOR
"EACH VALUE IS CONTINED IN THE FINAL REPORT.
PAGE
"MMS DEMOGRAPHIC MODEL STANDARD VALUES FOR COASTAL AREA %0
"-------------------------------------------------------------------------
```

```
DISPLAY.MAC     SAM macro to display data files

"  ITEM                  OFF/ON SHORE   OFF/ON SHORE   TYPE I        TYPE II
"                        CONSTRUCTION   MAINT & REPAIR
"-------------------------------------------------------------------------
"AGE DISTRIBUTION OF
"MALE IN-MIGRANTS:
"  20-24                 %M8,1,12,2 %M8,2,12,2 %M8,3,12,2 %M8,4,12,2
"  24-34                 %M9,1,12,2 %M9,2,12,2 %M9,3,12,2 %M9,4,12,2
"  35-44                 %M10,1,12,2 %M10,2,12,2 %M10,3,12,2 %M10,4,12,2
"  45-64                 %M11,1,12,2 %M11,2,12,2 %M11,3,12,2 %M11,4,12,2
"
"AGE DISTRIBUTION OF
"FEMALE IN-MIGRANTS:
"  20-24                 %M12,1,12,2 %M12,2,12,2 %M12,3,12,2 %M12,4,12,2
"  24-34                 %M13,1,12,2 %M13,2,12,2 %M13,3,12,2 %M13,4,12,2
"  35-44                 %M14,1,12,2 %M14,2,12,2 %M14,3,12,2 %M14,4,12,2
"  45-64                 %M15,1,12,2 %M15,2,12,2 %M15,3,12,2 %M15,4,12,2
"
"AGE DISTRIBUTION OF
"CHILDREN
"   0- 5                 %M16,1,12,2 %M16,2,12,2 %M16,3,12,2 %M16,4,12,2
"   6-11                 %M17,1,12,2 %M17,2,12,2 %M17,3,12,2 %M17,4,12,2
"  12-14                 %M18,1,12,2 %M18,2,12,2 %M18,3,12,2 %M18,4,12,2
"  15-17                 %M19,1,12,2 %M19,2,12,2 %M19,3,12,2 %M19,4,12,2
"  18-19                 %M20,1,12,2 %M20,2,12,2 %M20,3,12,2 %M20,4,12,2
"  20-24                 %M21,1,12,2 %M21,2,12,2 %M21,3,12,2 %M21,4,12,2
PAGE
GOTO TOP

************************************************
* THIS SECTION DISPLAYS THE SETTING OF THE     *
* CURRENT LOCATION QUOTIENTS, WAGE/EMPLOYMENT  *
* RATIOS, AND THE WAGE/TOTAL INDUSTRIAL OUTPUT *
* FOR A GIVEN SECTOR.                          *
************************************************
:LQ
"
"
"
"                  DATA FILE LISTING FOR COASTAL AREA %0
"
"
"                                    LOCATION    WAGE         WAGE
"     INPUT/OUTPUT SECTORS          QUOTIENTS  EMPLOYMENT  TOTAL OUTPUT
"                                                RATIO        RATIO
"  1 LIVESTOCK & L.S. PRODUCTS  %M1,1,10,5 %M1,2,10,3 %M1,3,14,6
"  2 OTHER AGRICULTURAL PRODUC  %M2,1,10,5 %M2,2,10,3 %M2,3,14,6
"  3 FORESTY PRODUCTS           %M3,1,10,5 %M3,2,10,3 %M3,3,14,6
"  4 COMMERICAL FISHING         %M4,1,10,5 %M4,2,10,3 %M4,3,14,6
"  5 AGRICULTURAL, FORESTRY &   %M5,1,10,5 %M5,2,10,3 %M5,3,14,6
"  6 IRON & FERROALLY ORES MIN  %M6,1,10,5 %M6,2,10,3 %M6,3,14,6
"  7 NONFERROUS METAL ORES MIN  %M7,1,10,5 %M7,2,10,3 %M7,3,14,6
"  8 COAL MINING                %M8,1,10,5 %M8,2,10,3 %M8,3,14,6
```

```
DISPLAY.MAC     SAM macro to display data files

"  9 CRUDE PETROLEUM & NATURAL %M9,1,10,5 %M9,2,10,3 %M9,3,14,6
" 10 DIMENSION, CRUSHED & BROK %M10,1,10,5 %M10,2,10,3 %M10,3,14,6
" 11 OTHER STONE & CLAY MINING %M11,1,10,5 %M11,2,10,3 %M11,3,14,6
" 12 CHEMICAL & FERTILIZER MIN %M12,1,10,5 %M12,2,10,3 %M12,3,14,6
" 13 NEW PETROLEUM PIPELINES   %M13,1,10,5 %M13,2,10,3 %M13,3,14,6
" 14 NEW PETRO & NG WELL DRILL %M14,1,10,5 %M14,2,10,3 %M14,3,14,6
" 15 NEW PETRO & NG EXPLORE    %M15,1,10,5 %M15,2,10,3 %M15,3,14,6
" 16 OTHER NEW CONSTRUCTION    %M16,1,10,5 %M16,2,10,3 %M16,3,14,6
" 17 MAINT OF GAS UTIL FACILIT %M17,1,10,5 %M17,2,10,3 %M17,3,14,6
" 18 MAINT OF PETRO & NG PIPEL %M18,1,10,5 %M18,2,10,3 %M18,3,14,6
" 19 MAINT OF PETRO & NG WELLS %M19,1,10,5 %M19,2,10,3 %M19,3,14,6
" 20 OTHER MAINTENANCE & REPAI %M20,1,10,5 %M20,2,10,3 %M20,3,14,6
" 21 ORDNANCE & ACCESSORIES    %M21,1,10,5 %M21,2,10,3 %M21,3,14,6
" 22 CANNED & CURED SEA FOOD   %M22,1,10,5 %M22,2,10,3 %M22,3,14,6
" 23 FRESH & FROZEN PACKAGED F %M23,1,10,5 %M23,2,10,3 %M23,3,14,6
" 24 OTHER FOOD & KINDRED PROD %M24,1,10,5 %M24,2,10,3 %M24,3,14,6
" 25 TOBACCO MANUFACTURES      %M25,1,10,5 %M25,2,10,3 %M25,3,14,6
" 26 TEXTILES & APPARELS       %M26,1,10,5 %M26,2,10,3 %M26,3,14,6
" 27 LOGGING CAMPUS & LOGGING  %M27,1,10,5 %M27,2,10,3 %M27,3,14,6
" 28 SAWMILLS & PLANING MILLS, %M28,1,10,5 %M28,2,10,3 %M28,3,14,6
" 29 OTHER LUMBER & WOOD PRODU %M29,1,10,5 %M29,2,10,3 %M29,3,14,6
" 30 FURNITURE & FIXTURES      %M30,1,10,5 %M30,2,10,3 %M30,3,14,6
" 31 PAPER & ALLIED PRODUCTS,  %M31,1,10,5 %M31,2,10,3 %M31,3,14,6
" 32 PAPERBOARD CONTAINERS &   %M32,1,10,5 %M32,2,10,3 %M32,3,14,6
" 33 PRINTING & PUBLISHING     %M33,1,10,5 %M33,2,10,3 %M33,3,14,6
" 34 INDUSTRIAL INORGANIC & OR %M34,1,10,5 %M34,2,10,3 %M34,3,14,6
" 35 OTHER CHEMICALS & SELECTE %M35,1,10,5 %M35,2,10,3 %M35,3,14,6
" 36 PLASTICS & SYNTHETIC  MAT %M36,1,10,5 %M36,2,10,3 %M36,3,14,6
" 37 DRUGS, CLEANING & TOILET  %M37,1,10,5 %M37,2,10,3 %M37,3,14,6
" 38 PAINTS & ALLIED PRODUCTS  %M38,1,10,5 %M38,2,10,3 %M38,3,14,6
" 39 PETROLEUM REFINING        %M39,1,10,5 %M39,2,10,3 %M39,3,14,6
" 40 PETROLEUM PRODUCTS        %M40,1,10,5 %M40,2,10,3 %M40,3,14,6
" 41 RUBBER & MISC. PLASTICS P %M41,1,10,5 %M41,2,10,3 %M41,3,14,6
" 42 LEATHER, FOOTWEAR & OTHER %M42,1,10,5 %M42,2,10,3 %M42,3,14,6
" 43 GLASS & GLASS PRODUCTS    %M43,1,10,5 %M43,2,10,3 %M43,3,14,6
" 44 READY-MIX CONCRETE        %M44,1,10,5 %M44,2,10,3 %M44,3,14,6
" 45 OTHER STONE & CLAY PRODUC %M45,1,10,5 %M45,2,10,3 %M45,3,14,6
" 46 BLAST FURNACES & STEEL MI %M46,1,10,5 %M46,2,10,3 %M46,3,14,6
" 47 ELETROMETALLURGICAL PRODU %M47,1,10,5 %M47,2,10,3 %M47,3,14,6
" 48 STEEL PIPES & TUBES       %M48,1,10,5 %M48,2,10,3 %M48,3,14,6
" 49 IRON & STEEL FOUNDARIES   %M49,1,10,5 %M49,2,10,3 %M49,3,14,6
" 50 OTHER PRIMARY IRON & STEE %M50,1,10,5 %M50,2,10,3 %M50,3,14,6
" 51 ALUMINUM ROLLING & DRAWIN %M51,1,10,5 %M51,2,10,3 %M51,3,14,6
" 52 NONFERROUS WIRE DRAWING & %M52,1,10,5 %M52,2,10,3 %M52,3,14,6
" 53 OTHER PRIMARY NONFERROUS  %M53,1,10,5 %M53,2,10,3 %M53,3,14,6
" 54 METAL CONTAINERS          %M54,1,10,5 %M54,2,10,3 %M54,3,14,6
" 55 FABRICATED STRUCTURAL STE %M55,1,10,5 %M55,2,10,3 %M55,3,14,6
" 56 FABRICATED PLATE WORK (BO %M56,1,10,5 %M56,2,10,3 %M56,3,14,6
" 57 SHEET METAL WORK          %M57,1,10,5 %M57,2,10,3 %M57,3,14,6
" 58 OTHER HEATING, PLUMBING & %M58,1,10,5 %M58,2,10,3 %M58,3,14,6
" 59 SCREW MACHINE PRODUCTS &  %M59,1,10,5 %M59,2,10,3 %M59,3,14,6
" 60 OTHER SCREW MACHINE PRODU %M60,1,10,5 %M60,2,10,3 %M60,3,14,6
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DISPLAY.MAC     SAM macro to display data files

" 61 METAL COATING & ALLIED SE %M61,1,10,5 %M61,2,10,3 %M61,3,14,6
" 62 MISC. FABRICATED WIRE PRO %M62,1,10,5 %M62,2,10,3 %M62,3,14,6
" 63 PIPE, VALVES, & PIPE FITT %M63,1,10,5 %M63,2,10,3 %M63,3,14,6
" 64 OTHER FABRICATED METAL PR %M64,1,10,5 %M64,2,10,3 %M64,3,14,6
" 65 ENGINES & TURBINES        %M65,1,10,5 %M65,2,10,3 %M65,3,14,6
" 66 FARM & GARDEN MACHINERY   %M66,1,10,5 %M66,2,10,3 %M66,3,14,6
" 67 OIL FIELD MACHINERY       %M67,1,10,5 %M67,2,10,3 %M67,3,14,6
" 68 CONSTRUCTION & MINING MAC %M68,1,10,5 %M68,2,10,3 %M68,3,14,6
" 69 MATERIALS HANDLING MACHIN %M69,1,10,5 %M69,2,10,3 %M69,3,14,6
" 70 METALWORKING MACHINERY &  %M70,1,10,5 %M70,2,10,3 %M70,3,14,6
" 71 SPECIAL INDUSTRY MACHINER %M71,1,10,5 %M71,2,10,3 %M71,3,14,6
" 72 GENERAL INDUSTRIAL MACHIN %M72,1,10,5 %M72,2,10,3 %M72,3,14,6
" 73 MISC. MACHINERY, EXCEPT E %M73,1,10,5 %M73,2,10,3 %M73,3,14,6
" 74 OFFICE, COMPUTING, & ACCO %M74,1,10,5 %M74,2,10,3 %M74,3,14,6
" 75 SERVICE INDUSTRY MACHINES %M75,1,10,5 %M75,2,10,3 %M75,3,14,6
" 76 ELECTRICAL INDUSTRIAL EQU %M76,1,10,5 %M76,2,10,3 %M76,3,14,6
" 77 HOUSEHOLD APPLIANCES      %M77,1,10,5 %M77,2,10,3 %M77,3,14,6
" 78 ELECTRIC LIGHTING & WIRIN %M78,1,10,5 %M78,2,10,3 %M78,3,14,6
" 79 RADIO, TV, & COMMUNICATIO %M79,1,10,5 %M79,2,10,3 %M79,3,14,6
" 80 ELECTRONIC COMPONENTS & A %M80,1,10,5 %M80,2,10,3 %M80,3,14,6
" 81 MISC. ELECTRICAL MACHINER %M81,1,10,5 %M81,2,10,3 %M81,3,14,6
" 82 SHIPBUILDING & REPAIR     %M82,1,10,5 %M82,2,10,3 %M82,3,14,6
" 83 OTHER TRANSPORTATION EQUI %M83,1,10,5 %M83,2,10,3 %M83,3,14,6
" 84 SCIENTIFIC, PHOTOGRAPHIC  %M84,1,10,5 %M84,2,10,3 %M84,3,14,6
" 85 MISC. MANUFACTURING       %M85,1,10,5 %M85,2,10,3 %M85,3,14,6
" 86 RAILROADS & RELATED SERVI %M86,1,10,5 %M86,2,10,3 %M86,3,14,6
" 87 MOTOR FREIGHT TRANSPORTAT %M87,1,10,5 %M87,2,10,3 %M87,3,14,6
" 88 WATER TRANSPORTATION      %M88,1,10,5 %M88,2,10,3 %M88,3,14,6
" 89 PIPE LINES, EXCEPT NG     %M89,1,10,5 %M89,2,10,3 %M89,3,14,6
" 90 OTHER TRANSPORTATION & WA %M90,1,10,5 %M90,2,10,3 %M90,3,14,6
" 91 COMMUNICATIONS, EXCEPT RA %M91,1,10,5 %M91,2,10,3 %M91,3,14,6
" 92 RADIO & TV BROADCASTING   %M92,1,10,5 %M92,2,10,3 %M92,3,14,6
" 93 ELECTRIC SERVICES (UTILIT %M93,1,10,5 %M93,2,10,3 %M93,3,14,6
" 94 GAS PRODUCTION & DISTRIBU %M94,1,10,5 %M94,2,10,3 %M94,3,14,6
" 95 GAS, WATER, & SANITARY SE %M95,1,10,5 %M95,2,10,3 %M95,3,14,6
" 96 WHOLESALE TRADE           %M96,1,10,5 %M96,2,10,3 %M96,3,14,6
" 97 RETAIL TRADE              %M97,1,10,5 %M97,2,10,3 %M97,3,14,6
" 98 BANKING                   %M98,1,10,5 %M98,2,10,3 %M98,3,14,6
" 99 INSURANCE CARRIERS        %M99,1,10,5 %M99,2,10,3 %M99,3,14,6
"100 OTHER FINANCE & INS    %M100,1,14,5 %M100,2,10,3 %M100,3,14,6
"101 REAL ESTATE & RENTAL   %M101,1,14,5 %M101,2,10,3 %M101,3,14,6
"102 HOTELS & LODGING       %M102,1,14,5 %M102,2,10,3 %M102,3,14,6
"103 PERSONAL & REPAIR SERV %M103,1,14,5 %M103,2,10,3 %M103,3,14,6
"104 MISC. REPAIR SHOPS     %M104,1,14,5 %M104,2,10,3 %M104,3,14,6
"105 COMPUTER & DATA PROC   %M105,1,14,5 %M105,2,10,3 %M105,3,14,6
"106 MANGAGEMENT & CONSULT  %M106,1,14,5 %M106,2,10,3 %M106,3,14,6
"107 EQUIP RENT & LEASE     %M107,1,14,5 %M107,2,10,3 %M107,3,14,6
"108 ADVERTISING            %M108,1,14,5 %M108,2,10,3 %M108,3,14,6
"109 LEGAL SERVICES         %M109,1,14,5 %M109,2,10,3 %M109,3,14,6
"110 ACCOUNTING, AUDITING   %M110,1,14,5 %M110,2,10,3 %M110,3,14,6
"111 OTHER BUSINESS SERV    %M111,1,14,5 %M111,2,10,3 %M111,3,14,6
"112 EATING & DRINKING      %M112,1,14,5 %M112,2,10,3 %M112,3,14,6
```

```
DISPLAY.MAC     SAM macro to display data files

"113 AUTOMOTIVE REPAIR      %M113,1,14,5 %M113,2,10,3 %M113,3,14,6
"114 AMUSEMENTS             %M114,1,14,5 %M114,2,10,3 %M114,3,14,6
"115 HEALTH, EDUCATIONAL    %M115,1,14,5 %M115,2,10,3 %M115,3,14,6
"116 OTHER INDUSTRY         %M116,1,14,5 %M116,2,10,3 %M116,3,14,6
PAGE
GOTO TOP
```

```
HHROW.MAC    SAM macro to adjust the household row with demographic data

IF .%0 == . GOTO NEW1
GOTO CONTINUE
:NEW1
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                      HOUSEHOLD ROW ADJUSTMENT MACRO

                    ENTER THE COASTAL REGION TO UPDATE

       W1  - SOUTH TEXAS COAST          W2  - NORTH TEXAS COAST
       C1  - WEST LOUISIANA COAST       C2  - CENTRAL LOUISIANA COAST
       C3  - EAST LOUISIANA COAST       C4  - MISSISSIPPI & ALABAMA COAST
       E1  - FLORIDA COAST (PENSECOLA)  E2  - NORTH CENTRAL FLORIDA COAST
       E3  - FLORIDA COAST (TAMPA)      E4  - SOUTH FLORIDA COAST
MESSAGE

MACRO PROMPT %0 STOP
IF %0 == STOP MACRO MMS.MAC
GOTO CONTINUE
:CONTINUE
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE

        UPDATING THE DIRECT REQUIREMENTS TABLE AND TOTAL REQUIREMENTS
             TABLE FOR REGION %0 (REGION%0.AIJ AND REGION%0.TOT)

A NEW SERIES OF HOUSEHOLD ROWS ARE CREATED USING THE UPDATED
DEMOGF%0.DAT DEMOGRAPHICS DATA FILE.

GET REGION%0.AIJ    NO
IF NR = 119 COLLAPSE ROWS 117 119 STOP
IF NC < 119 SUM R 1 NR NC NC
IF NC < 119 SUM R 1 NR NC NC
SUM C 117 117 1 NC
SUM C 117 117 1 NC
IF NR = 119 IF NC = 119 GOTO HHROW2
MESSAGE MESSAGE
*** THE REGION%0.AIJ HAS AN INVALID SIZE. IT MUST BE 119X119
INFO EXIT

************************************************************
*THE NEXT LINE MULTIPLIES THE PERSONAL CONSUMPTION OF      *
*THE COMMUTERS BY ZERO.  THE PERSONAL CONSUMPTION          *
*COLUMNS (117-119) CAN BE SET TO ANY VALUE.                *
*RELOCATING AND LOCAL CONSUMPTION REMAINS FIXED TO THE     *
*USA AVERAGE.                                              *
************************************************************
:HHROW2
MATH * SCAL 1 NR 118 118 0.0 STOP
GOTO HHROW3
************************************************************
* THE HOUSEHOLD ROWS AREA SEPARATED ACCORDING TO THE       *
* PROPORTIONS LISTED IN THE DEMOGFXX.DAT FILE.             *
************************************************************
```

```
HHROW.MAC    SAM macro to adjust the household row with demographic data

:HHROW3
MATH
* VEC ROW 117 119  13  15 GET DEMOGF%0.DAT C 1
* VEC ROW 117 119  17  19 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119  39  39 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119  89  89 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119   1  12 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  16  16 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  20  38 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  40  88 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  90  95 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  96 116 GET DEMOGF%0.DAT C 4
STOP
SAVE REGION%0.AIJ YES NO
IF .%1 == .EXIT EXIT
L-INVERSE YES
SAVE REGION%0.TOT YES NO
MACRO MMS.MAC
```

```
IMPACTS.MAC     SAM macro to perform impacts assessment

GOTO START
     ************************************************
     * This is the IMPACTS macro.  There are a variety*
     * of files which must be available for this macro*
     * to work.  The INITIAL macro must be executed to*
     * create the direct requirements and total       *
     * requirements tables.                           *
     ************************************************
:START
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
```

```
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                          IMPACT ASSESSMENT MACRO

                    ENTER THE COASTAL REGION TO EXAMINE

       W1   - SOUTH TEXAS COAST           W2   - NORTH TEXAS COAST
       C1   - WEST LOUISIANA COAST        C2   - CENTRAL LOUISIANA COAST
       C3   - EAST LOUISIANA COAST        C4   - MISSISSIPPI & ALABAMA COAST
       F1   - FLORIDA COAST (PENSECOLA)   E2   - NORTH CENTRAL FLORIDA COAST
       E3   - FLORIDA COAST (TAMPA)       E4   - SOUTH FLORIDA COAST
MESSAGE

MACRO PROMPT %0 STOP
IF %0 == STOP MACRO MMS.MAC
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
       THE INPUT OUTPUT  TABLE USED IS    REGION%0.TOT
       THE IMPACT VECTOR TABLE USED IS    IMPACT%0.DAT
       THE EMPLOYMENT RATIOS ARE IN TABLE LQ%0.DAT

       DO YOU WANT TO UPDATE THE IMPACT VECTOR : IMPACT%0.DAT ? (Y/N)
CHANGE PROMPT %2 STOP
IF %2 == STOP EXIT
IF %2 == 0    EXIT
IF %2 == Y GOTO UPDATE
GOTO NO_UPDATE
     ************************************************
     * The data file IMPACT%0.DAT will be modified    *
     * in the next section.                           *
     ************************************************
:UPDATE
GET IMPACT%0.DAT NO
ASSIGN %4 0
INCREMENT %4 AIJ 13 1
```

```
IMPACTS.MAC     SAM macro to perform impacts assessment

MESSAGE MESSAGE
ENTER THE NEW VALUE FOR:
(13)   CONTRUCTION OF NEW PETOLEUM & NATRUAL GAS PIPELINES (%4)
CHANGE 13 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 14 1
MESSAGE
(14)   NEW PETOLEUM & NATRUAL GAS WELL DRILLING (%4)
CHANGE 14 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 15 1
MESSAGE
(15)   NEW PETOLEUM & NATRUAL GAS & SOLID MINERAL EXPLORATION (%4)
CHANGE 15 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 17 1
MESSAGE
(17)   MAINTENANCE & REPAIR OF GAS UTILITY FACILITIES  (%4)
CHANGE 17 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 18 1
MESSAGE
(18)   MAINTENANCE & REPAIR OF PETROLEUM PIPELINES (%4)
CHANGE 18 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 19 1
MESSAGE
(19)   MAINTENANCE & REPAIR OF PETROLEUM & NATURAL GAS WELLS (%4)
CHANGE 19 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 39 1
MESSAGE
(39)   PETROLEUM REFINING  (%4)
CHANGE 39 1 PROMPT %5 %5 STOP
ASSIGN %4 0
INCREMENT %4 AIJ 89 1
MESSAGE
(89)   PIPELINES, EXCEPT NATURAL GAS  (%4)
CHANGE 89 1 PROMPT %5 %5 STOP
SAVE IMPACT%0.DAT YES NO
GOTO NO_UPDATE
     ************************************************
     * This next section creates the column vector or *
     * impacts for the region.  Four columns are made *
     * which are intial impacts, total impacts,       *
     * employment impacts and income impacts.  These  *
     * are stored in the temporary file ECONTEMP      *
     ************************************************
:NO_UPDATE
GET REGION%0.TOT NO
MATH * VECTOR COLUMN 1 NR 1 NC GET IMPACT%0.DAT C 1  STOP
COLLAPSE C 1 NR STOP
```

```
IMPACTS.MAC      SAM macro to perform impacts assessment

SAVE TEMP YES NO
GET IMPACT%0.DAT
APPEND COLUMN GET TEMP C 1 GET TEMP C 1 GET TEMP C 1 STOP
MATH * VECTOR ROWS 1 NR  3 4 GET LQ%0.DAT C 3
     / VECTOR ROWS 1 NR  3 3 GET LQ%0.DAT C 2 STOP
SAVE TEMP YES NO
IF NR > 119 DELETE ROWS 120 NR STOP
SUM COLUMNS 13 15 1 NC
SUM COLUMNS 17 19 1 NC
SUM COLUMNS 39 39 1 NC
SUM COLUMNS 89 89 1 NC
COLLAPSE ROWS 120 123 STOP
SUM COL  1 12 1 NC
SUM COL 16 16 1 NC
SUM COL 20 38 1 NC
SUM COL 40 88 1 NC
SUM COL 90 95 1 NC
COLLAPSE ROWS 121 125 STOP
SUM COL 96 116 1 NC
SAVE ECONTEMP YES NO
:CREATE_THE :DEMOGRAPHIC_TEMPORARY :DATA_FILE
SUM COLUMNS 13 15 1 NC
SUM COLUMNS 17 19 1 NC
SUM COLUMNS 39 39 1 NC
SUM COLUMNS 89 89 1 NC
DELETE ROW 1 120 STOP
COLLAPSE R 4 6 STOP
MOVE R 3 1 4 1 STOP
MATH TRANS STOP
SAVE DEMOTEMP YES NO
MACRO IMPACT2.MAC %
```

```
IMPACT2.MAC     SAM macro to continue impact assessment

MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE

MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                        DEMOGRAPHIC TABLE SELECTION
                           FOR COASTAL REGION %0
                     ENTER THE SELECTION NUMBER FOR THE TABLE.

              1  COMPLETE INDUSTRY DETAIL BY DOLLARS AND EMPLOYMENT
              2  POPULATION IMPACTS DUE TO IN-MIGRATION EMPLOYMENT
              3  DIRECT & INDIRECT ECONOMIC IMPACTS, SUMMARY
              4  EMPLOYMENT BY TYPE OF WORKER, SUMMARY
              5  INCOME BY TYPE OF WORKER, SUMMARY
              6  SELECT A NEW REGION
MESSAGE MESSAGE
              0  STOP

MACRO PROMPT %1 STOP
IF %1 >= 7 MACRO MMS.MAC
IF %1 < 1  MACRO MMS.MAC
IF %1 == STOP MACRO MMS.MAC
IF %1 = 6 MACRO IMPACTS.MAC
MACRO TABLE%1.MAC %
EXIT
```

```
INITIAL.MAC    SAM macro to create the initial study area I/O tables

ECHO ON
IF .%2 == .INIT1 GOTO INIT1
IF .%2 == .INIT3 GOTO INIT3
ASSIGN %0 START
GET MAKE.DAT
MACRO PERKROW.MAC % INITIAL INIT1
:INIT1
NORMALIZE COLUMN NO
SAVE WORK1 YES
NO
GOTO INIT2
:INIT2
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE

MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                          INPUT-OUTPUT TABLE CREATION MENU
                              ENTER THE COASTAL REGION

       W1  - SOUTH TEXAS COAST           W2  - EAST TEXAS COAST
       C1  - WEST LOUISIANA COAST        C2  - CENTRAL LOUISIANA COAST
       C3  - EAST LOUISIANA COAST        C4  - MISSISSIPPI & ALABAMA COAST
       E1  - FLORIDA COAST (PENSECOLA)   E2  - WEST CENTRAL FLORIDA COAST
       E3  - FLORIDA COAST (TAMPA)       E4  - SOUTH FLORIDA COAST

MACRO PROMPT %0 STOP
IF %0 == STOP MACRO MMS.MAC
GET USE.DAT
CHANGE 540 223 0 540 472 0 540 524 0 540 528 0
       538 535 0 532 538 0 535 538 0 STOP
MATH * SCALAR 1 NR 526 526 0 STOP
MATH * VECTOR ROWS 1 540 1 NC GET GULFPRC.DAT C 1
     * VECTOR ROWS 1 540 1 NC GET GULFIMP.DAT C 1 STOP
NORMAL COLUMN NO
DELETE COLUMN 539 NC  STOP
DELETE ROW    539 540 STOP
MATH * VECTOR COL  1 NR 1 NC  GET AREA%0.DAT C 3 STOP
MACRO PERKCOL.MAC % INITIAL INIT3
**********************************************
* CREATE THE AIJ TABLE FROM THE COLLAPSED USE *
* AND COLLAPSED MAKE TABLES.  REGIONALIZE     *
* USING THE SIMPLE LOCATION QUOTIENT TECHNIQUE*
**********************************************
:INIT3
SAVE WORK2 YES NO
```

```
INITIAL.MAC    SAM macro to create the initial study area I/O tables

MATH REV * MATRIX WORK1 STOP INFO
MATH * VEC ROWS 1 NR  1 NC GET LQ%0.DAT C 1 STOP
SAVE REGION%0.AIJ YES NO
GOTO INIT4
*********************************************
* UPDATE THE LQ FILE.  COLUMN 3 CONTAINS THE *
* WAGE/OUTPUT RATIO FOR THE COASTAL IO TABLE *
*********************************************
:INIT4
GET LQ%0.DAT
IF NC > 2 DELETE C 3 NC STOP
APPEND C GET REGION%0.AIJ R 117 STOP
SAVE LQ%0.DAT YES
MACRO HHROW.MAC
```

```
LQ.MAC     SAM macro to create the location quotients from AREAxx.dat files


IF .%2 == .LQ1 GOTO LQ1
GOTO TOP
           THIS SUBPROGRAM CALCULATES THE LOCATION QUOTIENTS
           FROM DATA FILES CREATED USING THE CBP FORTRAN
           PROGRAM.  THE DATA FILES AREA AREAXX FILES.
:TOP
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                          LOCATION QUOTIENT MACRO

                          ENTER THE COASTAL REGION
       W1  - SOUTH TEXAS COAST          W2  - NORTH TEXAS COAST
       C1  - WEST LOUISIANA COAST       C2  - CENTRAL LOUISIANA COAST
       C3  - EAST LOUISIANA COAST       C4  - MISSISSIPPI & ALABAMA COAST
       F1  - FLORIDA COAST (PENSECOLA)  E2  - NORTH CENTRAL FLORIDA COAST
       E3  - FLORIDA COAST (TAMPA)      E4  - SOUTH FLORIDA COAST

MACRO PROMPT %0 STOP
IF %0 == STOP MACRO MMS.MAC
GET AREAUS.DAT
APPEND MATRIX COL AREA%0.DAT
DELETE C 6 6 C 2 3 STOP
ASSIGN %1 LQ ASSIGN %2 LQ1
MACRO PERKROW.MAC % % % %
:LQ1
INFO
SAVE LQ%0.DAT YES
NO
MATH / VECTOR ROWS 1 NR 3 3 GET LQ%0.DAT C 2
     / VECTOR ROWS 1 NR 2 2 GET LQ%0.DAT C 1 STOP
ASSIGN %4 0 INC %4 AIJ NR 2
MATH / SCALAR 1 NR 2 2 %4 STOP
DELETE C 1 1 R NR NR STOP
SAVE LQ%0.DAT YES NO
ASSIGN %4 0
GOTO LOOPA
*** THIS SECTION LIMITS THE MAXIMUM LOCATION QUOTIENT TO 1.0
:LOOPA
INC %4 1
IF %4 > NR SAVE LQ%0.DAT YES GOTO REPAIR
IF AIJ %4 1 > 1.0 CHANGE %4 1 1.0 STOP
GOTO LOOPA
*********************************************************
* THIS SECTION PLACES THE CORRECT WAGE/EMPLOYEE RATIOS *
* IN THE AGRICULTURE AND 'OTHER' INDUSTRY CATEGORIES   *
* THESE  VALUES ARE CONTAINED IN TABLE AGWAGE.DAT      *
*********************************************************
FIRST DETERMINE THE COLUMN OF THE SECTOR
:REPAIR
IF .%0 == .W1 ASSIGN %4 1
IF .%0 == .W2 ASSIGN %4 2
IF .%0 == .C1 ASSIGN %4 3
```

```
LQ.MAC     SAM macro to create the location quotients from AREAxx.dat files

IF .%0 == .C2 ASSIGN %4 4
IF .%0 == .C3 ASSIGN %4 5
IF .%0 == .C4 ASSIGN %4 6
IF .%0 == .F1 ASSIGN %4 7
IF .%0 == .E2 ASSIGN %4 8
IF .%0 == .E3 ASSIGN %4 9
IF .%0 == .E4 ASSIGN %4 10
APPEND ROW GET AGWAGE.DAT C %4 STOP
ASSIGN %4 0 ASSIGN %5 0
INC %4 AIJ NR 1 INC %5 AIJ NR 2
CHANGE  1 2 %4  2 2 %4  116 2 %5 STOP
DELETE R 118 NR STOP
SAVE LQ%0.DAT YES
GOTO TOP
IF .%0 == . GOTO NEW1
GOTO CONTINUE
:NEW1
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                      HOUSEHOLD ROW ADJUSTMENT MACRO

                    ENTER THE COASTAL REGION TO UPDATE

       W1  - SOUTH TEXAS COAST          W2  - NORTH TEXAS COAST
       C1  - WEST LOUISIANA COAST       C2  - CENTRAL LOUISIANA COAST
       C3  - EAST LOUISIANA COAST       C4  - MISSISSIPPI & ALABAMA COAST
       E1  - FLORIDA COAST (PENSECOLA)  E2  - NORTH CENTRAL FLORIDA COAST
       E3  - FLORIDA COAST (TAMPA)      E4  - SOUTH FLORIDA COAST
MESSAGE

MACRO PROMPT %0 STOP
IF %0 == STOP MACRO MMS.MAC
GOTO CONTINUE
:CONTINUE
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE

        UPDATING THE DIRECT REQUIREMENTS TABLE AND TOTAL REQUIREMENTS
             TABLE FOR REGION %0 (REGION%0.AIJ AND REGION%0.TOT)

A NEW SERIES OF HOUSEHOLD ROWS ARE CREATED USING THE UPDATED
DEMOGF%0.DAT DEMOGRAPHICS DATA FILE.

GET REGION%0.AIJ    NO
IF NR = 119 COLLAPSE ROWS 117 119 STOP
IF NC < 119 SUM R 1 NR NC NC
IF NC < 119 SUM R 1 NR NC NC
SUM C 117 117 1 NC
SUM C 117 117 1 NC
IF NR = 119 IF NC = 119 GOTO HHROW2
MESSAGE MESSAGE
*** THE REGION%0.AIJ HAS AN INVALID SIZE. IT MUST BE 119X119
INFO EXIT
```

```
LQ.MAC     SAM macro to create the location quotients from AREAxx.dat files

************************************************************
*THE NEXT LINE MULTIPLIES THE PERSONAL CONSUMPTION OF   *
*THE COMMUTERS BY ZERO.  THE PERSONAL CONSUMPTION       *
*COLUMNS (117-119) CAN BE SET TO ANY VALUE.             *
*RELOCATING AND LOCAL CONSUMPTION REMAINS FIXED TO THE  *
*USA AVERAGE.                                           *
************************************************************
:HHROW2
MATH * SCAL 1 NR 118 118 0.0 STOP
GOTO HHROW3
************************************************************
* THE HOUSEHOLD ROWS AREA SEPARATED ACCORDING TO THE    *
* PROPORTIONS LISTED IN THE DEMOGFXX.DAT FILE.          *
************************************************************
:HHROW3
MATH
* VEC ROW 117 119  13  15 GET DEMOGF%0.DAT C 1
* VEC ROW 117 119  17  19 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119  39  39 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119  89  89 GET DEMOGF%0.DAT C 2
* VEC ROW 117 119   1  12 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  16  16 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  20  38 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  40  88 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  90  95 GET DEMOGF%0.DAT C 3
* VEC ROW 117 119  96 116 GET DEMOGF%0.DAT C 4
STOP
SAVE REGION%0.AIJ YES NO
IF .%1 == .EXIT EXIT
L-INVERSE YES
SAVE REGION%0.TOT YES NO
MACRO MMS.MAC
```

```
MMS.MAC     SAM macro to start impact assessment

MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE




GOTO TOP
:TOP
MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE MESSAGE
                      MMSIO INPUT-OUTPUT PROGRAM MAIN MENU
                              ENTER THE OPTION

       1  - RUN IMPACT ASSESSMENT SCENARIOS.
       2  - PRINT THE SELECTED DATA FILES.
       3  - UPDATE TOTAL REQUIREMENTS TABLE WITH NEW DEMOGRAPHICS DATA.
       4  - CREATE AN UPDATED INPUT-OUTPUT TABLE FOR A REGION.
            (THIS IS USED ONLY AFTER "CBP" PROGRAM WAS RUN)
       5  - CREATE A NEW SET OF LOCATION QUOTIENTS.  THIS MUST BE
            RUN BEFORE CREATING AN UPDATED I-O TABLE.
MESSAGE MESSAGE
       0  - STOP


MACRO PROMPT %0 STOP
IF %0 == STOP EXIT
IF %0 == 0    EXIT
IF %0 == 1    MACRO IMPACTS.MAC
IF %0 == 2    MACRO DISPLAY.MAC
IF %0 == 3    MACRO HHROW.MAC
IF %0 == 4    MACRO INITIAL.MAC
IF %0 == 5    MACRO LQ.MAC
MESSAGE
INVALID ENTRY '%0' : ENTER A NUMBER BETWEEN 0 - 5 INCLUSIVE
GOTO TOP
```

PERKCOL.MAC SAM macro to collapse column sectors

```
COLLAPSE COLUMN 524 537 STOP
COLLAPSE COLUMN 509 523 STOP
COLLAPSE COLUMN 502 508 STOP
COLLAPSE COLUMN 499 501 STOP
MOVE     COLUMN 497 486 STOP
MOVE     COLUMN 496 486 STOP
MOVE     COLUMN 496 486 STOP
MOVE     COLUMN 494 486 STOP
MOVE     COLUMN 493 486 STOP
MOVE     COLUMN 493 486 STOP
COLLAPSE COLUMN 492 497 STOP
COLLAPSE COLUMN 479 484 STOP
COLLAPSE COLUMN 476 477 STOP
MOVE     COLUMN 474 472 STOP
COLLAPSE COLUMN 473 475 STOP
COLLAPSE COLUMN 467 468 STOP
MOVE     COLUMN 460 456 STOP
MOVE     COLUMN 459 456 STOP
MOVE     COLUMN 459 456 STOP
COLLAPSE COLUMN 459 462 STOP
COLLAPSE COLUMN 435 454 STOP
COLLAPSE COLUMN 425 434 STOP
MOVE     COLUMN 417 410 STOP
COLLAPSE COLUMN 411 424 STOP
COLLAPSE COLUMN 405 409 STOP
COLLAPSE COLUMN 402 404 STOP
COLLAPSE COLUMN 398 401 STOP
COLLAPSE COLUMN 395 397 STOP
COLLAPSE COLUMN 388 394 STOP
COLLAPSE COLUMN 380 387 STOP
COLLAPSE COLUMN 375 379 STOP
COLLAPSE COLUMN 371 374 STOP
COLLAPSE COLUMN 369 370 STOP
COLLAPSE COLUMN 362 368 STOP
COLLAPSE COLUMN 356 361 STOP
COLLAPSE COLUMN 350 355 STOP
COLLAPSE COLUMN 346 349 STOP
MOVE     COLUMN 345 343 STOP
COLLAPSE COLUMN 344 345 STOP
COLLAPSE COLUMN 341 342 STOP
COLLAPSE COLUMN 339 340 STOP
MOVE     COLUMN 336 328 STOP
MOVE     COLUMN 335 328 STOP
MOVE     COLUMN 335 328 STOP
COLLAPSE COLUMN 331 338 STOP
COLLAPSE COLUMN 325 327 STOP
MOVE     COLUMN 320 314 STOP
MOVE     COLUMN 320 314 STOP
MOVE     COLUMN 319 314 STOP
COLLAPSE COLUMN 317 323 STOP
COLLAPSE COLUMN 312 313 STOP
MOVE     COLUMN 307 298 STOP
```

```
PERKCOL.MAC    SAM macro to collapse column sectors

MOVE     COLUMN 306 298 STOP
COLLAPSE COLUMN 300 311 STOP
MOVE     COLUMN 294 291 STOP
MOVE     COLUMN 294 291 STOP
COLLAPSE COLUMN 293 297 STOP
MOVE     COLUMN 278 266 STOP
COLLAPSE COLUMN 267 288 STOP
COLLAPSE COLUMN 264 265 STOP
COLLAPSE COLUMN 255 263 STOP
COLLAPSE COLUMN 249 254 STOP
COLLAPSE COLUMN 245 248 STOP
COLLAPSE COLUMN 238 242 STOP
COLLAPSE COLUMN 234 237 STOP
COLLAPSE COLUMN 225 233 STOP
COLLAPSE COLUMN 209 223 STOP
COLLAPSE COLUMN 196 207 STOP
COLLAPSE COLUMN 183 195 STOP
COLLAPSE COLUMN 171 182 STOP
COLLAPSE COLUMN 140 168 STOP
COLLAPSE COLUMN 136 139 STOP
MOVE     COLUMN 105  91 STOP
MOVE     COLUMN 101  91 STOP
COLLAPSE COLUMN  93 135 STOP
COLLAPSE COLUMN  85  90 STOP
MOVE     COLUMN  83  68 STOP
MOVE     COLUMN  77  68 STOP
MOVE     COLUMN  77  68 STOP
COLLAPSE COLUMN  71  84 STOP
MOVE     COLUMN  62  32 STOP
MOVE     COLUMN  62  32 STOP
MOVE     COLUMN  56  32 STOP
COLLAPSE COLUMN  35  67 STOP
COLLAPSE COLUMN  28  30 STOP
COLLAPSE COLUMN  23  24 STOP
COLLAPSE COLUMN  20  21 STOP
COLLAPSE COLUMN   5  17 STOP
COLLAPSE COLUMN   1   4 STOP
IF .%0 == . EXIT
MACRO %1.MAC % % % %
```

PERKROW.MAC SAM macro to collapse row sectors

```
COLLAPSE ROW 524 537 STOP
COLLAPSE ROW 509 523 STOP
COLLAPSE ROW 502 508 STOP
COLLAPSE ROW 499 501 STOP
MOVE     ROW 497 486 STOP
MOVE     ROW 496 486 STOP
MOVE     ROW 496 486 STOP
MOVE     ROW 494 486 STOP
MOVE     ROW 493 486 STOP
MOVE     ROW 493 486 STOP
COLLAPSE ROW 492 497 STOP
COLLAPSE ROW 479 484 STOP
COLLAPSE ROW 476 477 STOP
MOVE     ROW 474 472 STOP
COLLAPSE ROW 473 475 STOP
COLLAPSE ROW 467 468 STOP
MOVE     ROW 460 456 STOP
MOVE     ROW 459 456 STOP
MOVE     ROW 459 456 STOP
COLLAPSE ROW 459 462 STOP
COLLAPSE ROW 435 454 STOP
COLLAPSE ROW 425 434 STOP
MOVE     ROW 417 410 STOP
COLLAPSE ROW 411 424 STOP
COLLAPSE ROW 405 409 STOP
COLLAPSE ROW 402 404 STOP
COLLAPSE ROW 398 401 STOP
COLLAPSE ROW 395 397 STOP
COLLAPSE ROW 388 394 STOP
COLLAPSE ROW 380 387 STOP
COLLAPSE ROW 375 379 STOP
COLLAPSE ROW 371 374 STOP
COLLAPSE ROW 369 370 STOP
COLLAPSE ROW 362 368 STOP
COLLAPSE ROW 356 361 STOP
COLLAPSE ROW 350 355 STOP
COLLAPSE ROW 346 349 STOP
MOVE     ROW 345 343 STOP
COLLAPSE ROW 344 345 STOP
COLLAPSE ROW 341 342 STOP
COLLAPSE ROW 339 340 STOP
MOVE     ROW 336 328 STOP
MOVE     ROW 335 328 STOP
MOVE     ROW 335 328 STOP
COLLAPSE ROW 331 338 STOP
COLLAPSE ROW 325 327 STOP
MOVE     ROW 320 314 STOP
MOVE     ROW 320 314 STOP
MOVE     ROW 319 314 STOP
COLLAPSE ROW 317 323 STOP
COLLAPSE ROW 312 313 STOP
```

```
PERKROW.MAC     SAM macro to collapse row sectors

MOVE     ROW 307 298 STOP
MOVE     ROW 306 298 STOP
COLLAPSE ROW 300 311 STOP
MOVE     ROW 294 291 STOP
MOVE     ROW 294 291 STOP
COLLAPSE ROW 293 297 STOP
MOVE     ROW 278 266 STOP
COLLAPSE ROW 267 288 STOP
COLLAPSE ROW 264 265 STOP
COLLAPSE ROW 255 263 STOP
COLLAPSE ROW 249 254 STOP
COLLAPSE ROW 245 248 STOP
COLLAPSE ROW 238 242 STOP
COLLAPSE ROW 234 237 STOP
COLLAPSE ROW 225 233 STOP
COLLAPSE ROW 209 223 STOP
COLLAPSE ROW 196 207 STOP
COLLAPSE ROW 183 195 STOP
COLLAPSE ROW 171 182 STOP
COLLAPSE ROW 140 168 STOP
COLLAPSE ROW 136 139 STOP
MOVE     ROW 105  91 STOP
MOVE     ROW 101  91 STOP
COLLAPSE ROW  93 135 STOP
```

```
TABLE1.MAC      SAM macro - Complete Industry Detail

GET ECONTEMP
"
"                                    TABLE 1
"
"                 COMPLETE INDUSTRY DETAIL BY DOLLARS AND EMPLOYMENT
"                                  COASTAL AREA %0
"
" PRIMARY SECTORS
"
"                                        INITIAL       TOTALS ECONOMIC IMPACTS
"      INPUT/OUTPUT SECTORS              IMPACTS     OUTPUT     EMPLOYMENT    INCOME
"                                        ($000)      ($000)     (PER $000)    ($000)
" 13 NEW PETROLEUM PIPELINES    %M13,1,10,0 %M13,2,10,0 %M13,3,10,0 %M13,4,10,0
" 14 NEW PETRO & NG WELL DRILL  %M14,1,10,0 %M14,2,10,0 %M14,3,10,0 %M14,4,10,0
" 15 NEW PETRO & NG EXPLORE     %M15,1,10,0 %M15,2,10,0 %M15,3,10,0 %M15,4,10,0
" 17 MAINT OF GAS UTIL FACILIT  %M17,1,10,0 %M17,2,10,0 %M17,3,10,0 %M17,4,10,0
" 18 MAINT OF PETRO & NG PIPEL  %M18,1,10,0 %M18,2,10,0 %M18,3,10,0 %M18,4,10,0
" 19 MAINT OF PETRO & NG WELLS  %M19,1,10,0 %M19,2,10,0 %M19,3,10,0 %M19,4,10,0
" 39 PETROLEUM REFINING         %M39,1,10,0 %M39,2,10,0 %M39,3,10,0 %M39,4,10,0
" 89 PIPE LINES, EXCEPT NG      %M89,1,10,0 %M89,2,10,0 %M89,3,10,0 %M89,4,10,0
"                                 ========    =======     =======     ========
"    PRIMARY TOTALS       %M120,1,16,0 %M120,2,10,0 %M120,3,10,0 %M120,4,10,0
PAGE
"
"                                    TABLE 1
"
"                 COMPLETE INDUSTRY DETAIL BY DOLLARS AND EMPLOYMENT
"                                  COASTAL AREA %0
"
"
" SECONDARY SECTORS  - TYPE I
"
"                                        INITIAL       TOTALS ECONOMIC IMPACTS
"      INPUT/OUTPUT SECTORS              IMPACTS     OUTPUT     EMPLOYMENT    INCOME
"                                        ($000)      ($000)     (PER $000)    ($000)
"
"  1 LIVESTOCK & L.S. PRODUCTS %M1,1,10,0 %M1,2,10,0 %M1,3,10,0 %M1,4,10,0
"  2 OTHER AGRICULTURAL PRODUC %M2,1,10,0 %M2,2,10,0 %M2,3,10,0 %M2,4,10,0
"  3 FORESTY PRODUCTS          %M3,1,10,0 %M3,2,10,0 %M3,3,10,0 %M3,4,10,0
"  4 COMMERICAL FISHING        %M4,1,10,0 %M4,2,10,0 %M4,3,10,0 %M4,4,10,0
"  5 AGRICULTURAL, FORESTRY &  %M5,1,10,0 %M5,2,10,0 %M5,3,10,0 %M5,4,10,0
"  6 IRON & FERROALLY ORES MIN %M6,1,10,0 %M6,2,10,0 %M6,3,10,0 %M6,4,10,0
"  7 NONFERROUS METAL ORES MIN %M7,1,10,0 %M7,2,10,0 %M7,3,10,0 %M7,4,10,0
"  8 COAL MINING               %M8,1,10,0 %M8,2,10,0 %M8,3,10,0 %M8,4,10,0
"  9 CRUDE PETROLEUM & NATURAL %M9,1,10,0 %M9,2,10,0 %M9,3,10,0 %M9,4,10,0
" 10 DIMENSION, CRUSHED & BROK %M10,1,10,0 %M10,2,10,0 %M10,3,10,0 %M10,4,10,0
" 11 OTHER STONE & CLAY MINING %M11,1,10,0 %M11,2,10,0 %M11,3,10,0 %M11,4,10,0
" 12 CHEMICAL & FERTILIZER MIN %M12,1,10,0 %M12,2,10,0 %M12,3,10,0 %M12,4,10,0
" 16 OTHER NEW CONSTRUCTION    %M16,1,10,0 %M16,2,10,0 %M16,3,10,0 %M16,4,10,0
" 20 OTHER MAINTENANCE & REPAI %M20,1,10,0 %M20,2,10,0 %M20,3,10,0 %M20,4,10,0
" 21 ORDNANCE & ACCESSORIES    %M21,1,10,0 %M21,2,10,0 %M21,3,10,0 %M21,4,10,0
" 22 CANNED & CURED SEA FOOD   %M22,1,10,0 %M22,2,10,0 %M22,3,10,0 %M22,4,10,0
```

TABLE1.MAC SAM macro - Complete Industry Detail

```
" 23 FRESH & FROZEN PACKAGED F %M23,1,10,0 %M23,2,10,0 %M23,3,10,0 %M23,4,10,0
" 24 OTHER FOOD & KINDRED PROD %M24,1,10,0 %M24,2,10,0 %M24,3,10,0 %M24,4,10,0
" 25 TOBACCO MANUFACTURES      %M25,1,10,0 %M25,2,10,0 %M25,3,10,0 %M25,4,10,0
" 26 TEXTILES & APPARELS       %M26,1,10,0 %M26,2,10,0 %M26,3,10,0 %M26,4,10,0
" 27 LOGGING CAMPUS & LOGGING  %M27,1,10,0 %M27,2,10,0 %M27,3,10,0 %M27,4,10,0
" 28 SAWMILLS & PLANING MILLS, %M28,1,10,0 %M28,2,10,0 %M28,3,10,0 %M28,4,10,0
" 29 OTHER LUMBER & WOOD PRODU %M29,1,10,0 %M29,2,10,0 %M29,3,10,0 %M29,4,10,0
" 30 FURNITURE & FIXTURES      %M30,1,10,0 %M30,2,10,0 %M30,3,10,0 %M30,4,10,0
" 31 PAPER & ALLIED PRODUCTS,  %M31,1,10,0 %M31,2,10,0 %M31,3,10,0 %M31,4,10,0
" 32 PAPERBOARD CONTAINERS &   %M32,1,10,0 %M32,2,10,0 %M32,3,10,0 %M32,4,10,0
" 33 PRINTING & PUBLISHING     %M33,1,10,0 %M33,2,10,0 %M33,3,10,0 %M33,4,10,0
" 34 INDUSTRIAL INORGANIC & OR %M34,1,10,0 %M34,2,10,0 %M34,3,10,0 %M34,4,10,0
" 35 OTHER CHEMICALS & SELECTE %M35,1,10,0 %M35,2,10,0 %M35,3,10,0 %M35,4,10,0
" 36 PLASTICS & SYNTHETIC  MAT %M36,1,10,0 %M36,2,10,0 %M36,3,10,0 %M36,4,10,0
" 37 DRUGS, CLEANING & TOILET  %M37,1,10,0 %M37,2,10,0 %M37,3,10,0 %M37,4,10,0
" 38 PAINTS & ALLIED PRODUCTS  %M38,1,10,0 %M38,2,10,0 %M38,3,10,0 %M38,4,10,0
" 40 PETROLEUM PRODUCTS        %M40,1,10,0 %M40,2,10,0 %M40,3,10,0 %M40,4,10,0
" 41 RUBBER & MISC. PLASTICS P %M41,1,10,0 %M41,2,10,0 %M41,3,10,0 %M41,4,10,0
" 42 LEATHER, FOOTWEAR & OTHER %M42,1,10,0 %M42,2,10,0 %M42,3,10,0 %M42,4,10,0
" 43 GLASS & GLASS PRODUCTS    %M43,1,10,0 %M43,2,10,0 %M43,3,10,0 %M43,4,10,0
" 44 READY-MIX CONCRETE        %M44,1,10,0 %M44,2,10,0 %M44,3,10,0 %M44,4,10,0
" 45 OTHER STONE & CLAY PRODUC %M45,1,10,0 %M45,2,10,0 %M45,3,10,0 %M45,4,10,0
" 46 BLAST FURNACES & STEEL MI %M46,1,10,0 %M46,2,10,0 %M46,3,10,0 %M46,4,10,0
" 47 ELETROMETALLURGICAL PRODU %M47,1,10,0 %M47,2,10,0 %M47,3,10,0 %M47,4,10,0
" 48 STEEL PIPES & TUBES       %M48,1,10,0 %M48,2,10,0 %M48,3,10,0 %M48,4,10,0
" 49 IRON & STEEL FOUNDARIES   %M49,1,10,0 %M49,2,10,0 %M49,3,10,0 %M49,4,10,0
" 50 OTHER PRIMARY IRON & STEE %M50,1,10,0 %M50,2,10,0 %M50,3,10,0 %M50,4,10,0
" 51 ALUMINUM ROLLING & DRAWIN %M51,1,10,0 %M51,2,10,0 %M51,3,10,0 %M51,4,10,0
" 52 NONFERROUS WIRE DRAWING & %M52,1,10,0 %M52,2,10,0 %M52,3,10,0 %M52,4,10,0
" 53 OTHER PRIMARY NONFERROUS  %M53,1,10,0 %M53,2,10,0 %M53,3,10,0 %M53,4,10,0
PAGE
"
"                                   TABLE 1
"
"              COMPLETE INDUSTRY DETAIL BY DOLLARS AND EMPLOYMENT
"                                COASTAL AREA %0
"
"
" SECONDARY SECTORS  - TYPE I
"
"                                        INITIAL       TOTALS ECONOMIC IMPACTS
"     INPUT/OUTPUT SECTORS               IMPACTS     OUTPUT     EMPLOYMENT    INCOME
"                                        ($000)      ($000)     (PER $000)    ($000)
"
" 54 METAL CONTAINERS           %M54,1,10,0 %M54,2,10,0 %M54,3,10,0 %M54,4,10,0
" 55 FABRICATED STRUCTURAL STE %M55,1,10,0 %M55,2,10,0 %M55,3,10,0 %M55,4,10,0
" 56 FABRICATED PLATE WORK (BO %M56,1,10,0 %M56,2,10,0 %M56,3,10,0 %M56,4,10,0
" 57 SHEET METAL WORK          %M57,1,10,0 %M57,2,10,0 %M57,3,10,0 %M57,4,10,0
" 58 OTHER HEATING, PLUMBING & %M58,1,10,0 %M58,2,10,0 %M58,3,10,0 %M58,4,10,0
" 59 SCREW MACHINE PRODUCTS &  %M59,1,10,0 %M59,2,10,0 %M59,3,10,0 %M59,4,10,0
" 60 OTHER SCREW MACHINE PRODU %M60,1,10,0 %M60,2,10,0 %M60,3,10,0 %M60,4,10,0
" 61 METAL COATING & ALLIED SE %M61,1,10,0 %M61,2,10,0 %M61,3,10,0 %M61,4,10,0
```

```
TABLE1.MAC      SAM macro - Complete Industry Detail

" 62 MISC. FABRICATED WIRE PRO %M62,1,10,0 %M62,2,10,0 %M62,3,10,0 %M62,4,10,0
" 63 PIPE, VALVES, & PIPE FITT %M63,1,10,0 %M63,2,10,0 %M63,3,10,0 %M63,4,10,0
" 64 OTHER FABRICATED METAL PR %M64,1,10,0 %M64,2,10,0 %M64,3,10,0 %M64,4,10,0
" 65 ENGINES & TURBINES        %M65,1,10,0 %M65,2,10,0 %M65,3,10,0 %M65,4,10,0
" 66 FARM & GARDEN MACHINERY   %M66,1,10,0 %M66,2,10,0 %M66,3,10,0 %M66,4,10,0
" 67 OIL FIELD MACHINERY       %M67,1,10,0 %M67,2,10,0 %M67,3,10,0 %M67,4,10,0
" 68 CONSTRUCTION & MINING MAC %M68,1,10,0 %M68,2,10,0 %M68,3,10,0 %M68,4,10,0
" 69 MATERIALS HANDLING MACHIN %M69,1,10,0 %M69,2,10,0 %M69,3,10,0 %M69,4,10,0
" 70 METALWORKING MACHINERY &  %M70,1,10,0 %M70,2,10,0 %M70,3,10,0 %M70,4,10,0
" 71 SPECIAL INDUSTRY MACHINER %M71,1,10,0 %M71,2,10,0 %M71,3,10,0 %M71,4,10,0
" 72 GENERAL INDUSTRIAL MACHIN %M72,1,10,0 %M72,2,10,0 %M72,3,10,0 %M72,4,10,0
" 73 MISC. MACHINERY, EXCEPT E %M73,1,10,0 %M73,2,10,0 %M73,3,10,0 %M73,4,10,0
" 74 OFFICE, COMPUTING, & ACCO %M74,1,10,0 %M74,2,10,0 %M74,3,10,0 %M74,4,10,0
" 75 SERVICE INDUSTRY MACHINES %M75,1,10,0 %M75,2,10,0 %M75,3,10,0 %M75,4,10,0
" 76 ELECTRICAL INDUSTRIAL EQU %M76,1,10,0 %M76,2,10,0 %M76,3,10,0 %M76,4,10,0
" 77 HOUSEHOLD APPLIANCES      %M77,1,10,0 %M77,2,10,0 %M77,3,10,0 %M77,4,10,0
" 78 ELECTRIC LIGHTING & WIRIN %M78,1,10,0 %M78,2,10,0 %M78,3,10,0 %M78,4,10,0
" 79 RADIO, TV, & COMMUNICATIO %M79,1,10,0 %M79,2,10,0 %M79,3,10,0 %M79,4,10,0
" 80 ELECTRONIC COMPONENTS & A %M80,1,10,0 %M80,2,10,0 %M80,3,10,0 %M80,4,10,0
" 81 MISC. ELECTRICAL MACHINER %M81,1,10,0 %M81,2,10,0 %M81,3,10,0 %M81,4,10,0
" 82 SHIPBUILDING & REPAIR     %M82,1,10,0 %M82,2,10,0 %M82,3,10,0 %M82,4,10,0
" 83 OTHER TRANSPORTATION EQUI %M83,1,10,0 %M83,2,10,0 %M83,3,10,0 %M83,4,10,0
" 84 SCIENTIFIC, PHOTOGRAPHIC  %M84,1,10,0 %M84,2,10,0 %M84,3,10,0 %M84,4,10,0
" 85 MISC. MANUFACTURING       %M85,1,10,0 %M85,2,10,0 %M85,3,10,0 %M85,4,10,0
" 86 RAILROADS & RELATED SERVI %M86,1,10,0 %M86,2,10,0 %M86,3,10,0 %M86,4,10,0
" 87 MOTOR FREIGHT TRANSPORTAT %M87,1,10,0 %M87,2,10,0 %M87,3,10,0 %M87,4,10,0
" 88 WATER TRANSPORTATION      %M88,1,10,0 %M88,2,10,0 %M88,3,10,0 %M88,4,10,0
" 90 OTHER TRANSPORTATION & WA %M90,1,10,0 %M90,2,10,0 %M90,3,10,0 %M90,4,10,0
" 91 COMMUNICATIONS, EXCEPT RA %M91,1,10,0 %M91,2,10,0 %M91,3,10,0 %M91,4,10,0
" 92 RADIO & TV BROADCASTING   %M92,1,10,0 %M92,2,10,0 %M92,3,10,0 %M92,4,10,0
" 93 ELECTRIC SERVICES (UTILIT %M93,1,10,0 %M93,2,10,0 %M93,3,10,0 %M93,4,10,0
" 94 GAS PRODUCTION & DISTRIBU %M94,1,10,0 %M94,2,10,0 %M94,3,10,0 %M94,4,10,0
" 95 GAS, WATER, & SANITARY SE %M95,1,10,0 %M95,2,10,0 %M95,3,10,0 %M95,4,10,0
"                              ========    =======    =======    =======
"    SECONDARY TYPE 1          %M121,1,10,0 %M121,2,10,0 %M121,3,10,0 %M121,4,10
PAGE
"
"                                   TABLE 1
"
"              COMPLETE INDUSTRY DETAIL BY DOLLARS AND EMPLOYMENT
"                                COASTAL AREA %0
"
"
" SECONDARY SECTORS  - TYPE II
"
"                                   INITIAL       TOTALS ECONOMIC IMPACTS
"     INPUT/OUTPUT SECTORS          IMPACTS    OUTPUT    EMPLOYMENT   INCOME
"                                   ($000)     ($000)    (PER $000)   ($000)
"
" 96 WHOLESALE TRADE           %M96,1,10,0 %M96,2,10,0 %M96,3,10,0 %M96,4,10,0
" 97 RETAIL TRADE              %M97,1,10,0 %M97,2,10,0 %M97,3,10,0 %M97,4,10,0
" 98 BANKING                  %M98,1,10,0 %M98,2,10,0 %M98,3,10,0 %M98,4,10,0
```

```
TABLE1.MAC     SAM macro - Complete Industry Detail

" 99 INSURANCE CARRIERS        %M99,1,10,0 %M99,2,10,0 %M99,3,10,0 %M99,4,10,0
"100 OTHER FINANCE & INS    %M100,1,13,0 %M100,2,10,0 %M100,3,10,0 %M100,4,10,0
"101 REAL ESTATE & RENTAL   %M101,1,13,0 %M101,2,10,0 %M101,3,10,0 %M101,4,10,0
"102 HOTELS & LODGING       %M102,1,13,0 %M102,2,10,0 %M102,3,10,0 %M102,4,10,0
"103 PERSONAL & REPAIR SERV %M103,1,13,0 %M103,2,10,0 %M103,3,10,0 %M103,4,10,0
"104 MISC. REPAIR SHOPS     %M104,1,13,0 %M104,2,10,0 %M104,3,10,0 %M104,4,10,0
"105 COMPUTER & DATA PROC   %M105,1,13,0 %M105,2,10,0 %M105,3,10,0 %M105,4,10,0
"106 MANGAGEMENT & CONSULT  %M106,1,13,0 %M106,2,10,0 %M106,3,10,0 %M106,4,10,0
"107 EQUIP RENT & LEASE     %M107,1,13,0 %M107,2,10,0 %M107,3,10,0 %M107,4,10,0
"108 ADVERTISING            %M108,1,13,0 %M108,2,10,0 %M108,3,10,0 %M108,4,10,0
"109 LEGAL SERVICES         %M109,1,13,0 %M109,2,10,0 %M109,3,10,0 %M109,4,10,0
"110 ACCOUNTING, AUDITING   %M110,1,13,0 %M110,2,10,0 %M110,3,10,0 %M110,4,10,0
"111 OTHER BUSINESS SERV    %M111,1,13,0 %M111,2,10,0 %M111,3,10,0 %M111,4,10,0
"112 EATING & DRINKING      %M112,1,13,0 %M112,2,10,0 %M112,3,10,0 %M112,4,10,0
"113 AUTOMOTIVE REPAIR      %M113,1,13,0 %M113,2,10,0 %M113,3,10,0 %M113,4,10,0
"114 AMUSEMENTS             %M114,1,13,0 %M114,2,10,0 %M114,3,10,0 %M114,4,10,0
"115 HEALTH, EDUCATIONAL    %M115,1,13,0 %M115,2,10,0 %M115,3,10,0 %M115,4,10,0
"116 OTHER INDUSTRY         %M116,1,13,0 %M116,2,10,0 %M116,3,10,0 %M116,4,10,0
"                             ========     =======     =======     =======
"    SECONDARY TYPE 2       %M122,1,13,0 %M122,2,10,0 %M122,3,10,0 %M122,4,10,0
"
PAGE
MACRO IMPACT2.MAC   %
```

```
TABLE2.MAC      SAM macro.  Demographic Table

GET DEMOGF%0.DAT
GOTO T1
*********************************************************************
*                       MALE POPULATION                             *
* IT IS ASSUMED THAT ALL MARRIED MALES WITH WORKING WIVES ALSO      *
* ARE EMPLOYED.  THE MULTIPLE JOG ADJUSTMENT FACTOR FOR THIS        *
* CATEGORY IS SET TO 2.0.  THE CALCULATION REDUCES DOWN TO BE       *
* EQUAL TO THE "PERCENT RELOCATING WHO ARE MALE" VALUE.             *
*********************************************************************
:T1
SUM C 5 5 1 NC
GOTO T2
*********************************************************************
*                     FEMALE POPULATION                             *
* THE PERCENT OF WORKERS WITH DEPENDENTS IS ASSUMED TO BE AN        *
* APPROPRIATE APPROXIMATION FOR THE PERCENT OF WORKERS WHO ARE      *
* MARRIED.  TOTAL FEMALE POPULATION = SINGLE FEMALE POPULATION      *
* + MARRIED FEMALE POPULATION.                                      *
*********************************************************************
:T2
SUM C 5 5 1 NC
MATH * VECTOR COL NR NR 1 NC GET DEMOGF%0.DAT R 4
     * SCALAR     NR NR 1 NC 2
     - VECTOR COL NR NR 1 NC GET DEMOGF%0.DAT R 4
     - VECTOR COL NR NR 1 NC GET DEMOGF%0.DAT R 5
     + SCALAR     NR NR 1 NC 1 STOP
GOTO T3
*********************************************************************
*                     CHILDREN POPULATION                           *
*                                                                   *
* RELOCATING_WORKERS_WITH DEPENDENTS*PERCENT_WITH_DEPENDENTS        *
*                                                                   *
*********************************************************************
:T3
SUM C 4 4 1 NC
MATH * VECTOR COL NR NR 1 NC GET DEMOGF%0.DAT R 6 STOP
GOTO T4
*********************************************************************
*  MULTIPLY THE TOTALS WITH ECONOMIC/DEMOGRAPHIC DATA               *
*********************************************************************
:T4
ASSIGN %3 -2 INCREMENT %3 NR
MATH * VECTOR COL %3 NR 1 NC GET DEMOGF%0.DAT R 3
     * VECTOR COL %3 NR 1 NC GET DEMOTEMP     R 3 STOP
SAVE TEMP2 YES
NO
GOTO T5
*********************************************************************
*  MULTIPLY THE ENTIRE TABLE WITH THE ADJUSTED POPULATION TOTALS    *
*********************************************************************
:T5
MATH * VECTOR COL  8 11 1 NC GET TEMP2 R 22
```

```
TABLE2.MAC     SAM macro.  Demographic Table

     * VECTOR COL 12 15 1 NC GET TEMP2 R 23
     * VECTOR COL 16 21 1 NC GET TEMP2 R 24 STOP
SUM C 22 24 1 NC
INFO
"
"
"                                        TABLE 2
"
"                                 POPULATION IMPACT DUE TO
"                                  IN-MIGRANT EMPLOYMENT
"                                  FOR COASTAL REGION %0
"
"
"                    -----------PRIMARY----------   ----------SECONDARY----------
"POPULATION          ON/OFF SHORE    ON/OFF SHORE         TYPE I          TYPE II
"                    OPERATION       CONSTRUCTION
"
"AGE DISTRBUTION
"OF MALES
"     20-24      %M08,1,15,0 %M08,2,15,0 %M08,3,15,0 %M08,4,15,0
"     25-34      %M09,1,15,0 %M09,2,15,0 %M09,3,15,0 %M09,4,15,0
"     35-44      %M10,1,15,0 %M10,2,15,0 %M10,3,15,0 %M10,4,15,0
"     45-64      %M11,1,15,0 %M11,2,15,0 %M11,3,15,0 %M11,4,15,0
"                          ------          ------          ------          ------
"     TOTAL      %M22,1,15,0 %M22,2,15,0 %M22,3,15,0 %M22,4,15,0
"
"AGE DISTRBUTION
"OF FEMALES
"     20-24      %M12,1,15,0 %M12,2,15,0 %M12,3,15,0 %M12,4,15,0
"     25-34      %M13,1,15,0 %M13,2,15,0 %M13,3,15,0 %M13,4,15,0
"     35-44      %M14,1,15,0 %M14,2,15,0 %M14,3,15,0 %M14,4,15,0
"     45-64      %M15,1,15,0 %M15,2,15,0 %M15,3,15,0 %M15,4,15,0
"                          ------          ------          ------          ------
"     TOTAL      %M23,1,15,0 %M23,2,15,0 %M23,3,15,0 %M23,4,15,0
"
"AGE DISTRBUTION
"OF CHILDERN
"      0- 5      %M16,1,15,0 %M16,2,15,0 %M16,3,15,0 %M16,4,15,0
"      6-11      %M17,1,15,0 %M17,2,15,0 %M17,3,15,0 %M17,4,15,0
"     12-14      %M18,1,15,0 %M18,2,15,0 %M18,3,15,0 %M18,4,15,0
"     15-17      %M19,1,15,0 %M19,2,15,0 %M19,3,15,0 %M19,4,15,0
"     18-19      %M20,1,15,0 %M20,2,15,0 %M20,3,15,0 %M20,4,15,0
"     20-24      %M21,1,15,0 %M21,2,15,0 %M21,3,15,0 %M21,4,15,0
"                          ------          ------          ------          ------
"     TOTAL      %M24,1,15,0 %M24,2,15,0 %M24,3,15,0 %M24,4,15,0
"
"                          ======          ======          ======          ======
"POPULATION
"CHANGE TOTAL   %M25,1,15,0 %M25,2,15,0 %M25,3,15,0 %M25,4,15,0
"
"
MACRO IMPACT2.MAC %
```

```
TABLE3.MAC     SAM macro.  Direct and Indirect Economic Activity Summary

GET DEMOTEMP NO
DELETE R 3 4 STOP
SUM C 2 2 1 NC
MATH - VECTOR C 2 2 1 NC GET DEMOTEMP R 1 STOP
"
"
"
"                                        TABLE 3
"
"               DIRECT & INDIRECT ECONOMIC IMPACT BY INDUSTRY GROUP
"                                  FOR COASTAL AREA %0
"                               (IN MILLIONS OF DOLLARS)
"
"
"               -----------PRIMARY----------   ----------SECONDARY----------
"   TYPE OF     ON/OFF SHORE    ON/OFF SHORE         TYPE I          TYPE II
"   IMPACT      OPERATION       CONSTRUCTION
"
"   DIRECT   %M1,1,15,0 %M1,2,15,0 %M1,3,15,0 %M1,4,15,0
"
"   INDIRECT %M2,1,15,0 %M2,2,15,0 %M2,3,15,0 %M2,4,15,0
"
"   TOTAL    %M3,1,15,0 %M3,2,15,0 %M3,3,15,0 %M3,4,15,0
"
PAGE
MACRO IMPACT2.MAC %
```

```
TABLE4.MAC     SAM macro.   Employment by Industry Groups Summary

GET DEMOGF%0.DAT NO
DELETE ROWS 4 NR STOP
MATH * VECTOR COL 1 NR 1 NC  GET DEMOTEMP  R 3 STOP
SUM C 1 NR 1 NC
"
"                                    TABLE 4
"
"                     EMPLOYMENT BY INDUSTRY GROUPS SUMMARY
"                               FOR COASTAL AREA %0
"
"
"                    -----------PRIMARY----------   ----------SECONDARY----------
"WORK FORCE          ON/OFF SHORE    ON/OFF SHORE         TYPE I          TYPE II
"                    OPERATION       CONSTRUCTION
"
"LOCAL           %M1,1,15,0 %M1,2,15,0 %M1,3,15,0 %M1,4,15,0
"
"COMMUTING       %M2,1,15,0 %M2,2,15,0 %M2,3,15,0 %M2,4,15,0
"
"RELOCATING      %M3,1,15,0 %M3,2,15,0 %M3,3,15,0 %M3,4,15,0
"                           ------          ------          ------          ------
"    TOTAL       %M4,1,15,0 %M4,2,15,0 %M4,3,15,0 %M4,4,15,0
"
PAGE
MACRO IMPACT2.MAC %
```

```
TABLE5.MAC      SAM macro.   Income by Industry Groups Summary

GET DEMOGF%0.DAT NO
DELETE ROWS 4 NR STOP
MATH * VECTOR C 1 NR 1 NC GET DEMOTEMP R 4 STOP
SUM C 1 NR 1 NC
"
"                                    TABLE 5
"
"                        INCOME BY INDUSTRY GROUPS SUMMARY
"                               FOR COASTAL AREA %0
"
"
"                   -----------PRIMARY----------   ----------SECONDARY----------
"WORK FORCE         ON/OFF SHORE    ON/OFF SHORE         TYPE I          TYPE II
"                   OPERATION       CONSTRUCTION
"
"LOCAL          %M1,1,15,0 %M1,2,15,0 %M1,3,15,0 %M1,4,15,0
"
"COMMUTING      %M2,1,15,0 %M2,2,15,0 %M2,3,15,0 %M2,4,15,0
"
"RELOCATING     %M3,1,15,0 %M3,2,15,0 %M3,3,15,0 %M3,4,15,0
"                          ------      ------        ------          ------
"    TOTAL      %M4,1,15,0 %M4,2,15,0 %M4,3,15,0 %M4,4,15,0
"
PAGE
MACRO IMPACT2.MAC %
```

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. The includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.