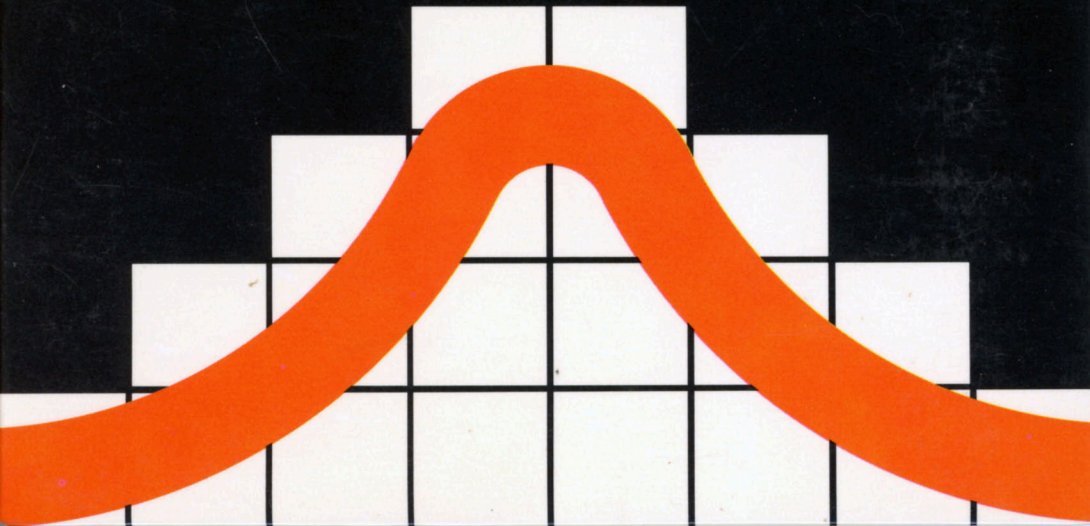
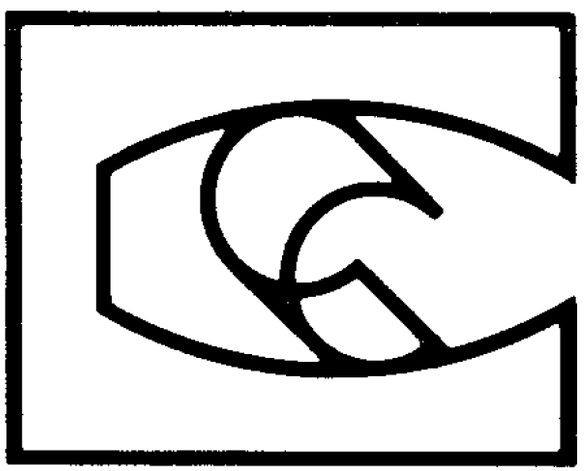
STATISTICS II.



STATISTICS II

Compucolor II

SOF-DISK LIBRARY



A system for applications in regression analysis.

Library Album No. 993002

Requires 16K user RAM

STATISTICS II
(REGRESSION)

TABLE OF CONTENTS

STATISTICS II

(REGRESSION)

Statistics II is a system of 5 programs plus a "MENU" program which operates on numerical data primarily for applications in regression analysis. It consists of the following programs, each of which is described below: FILES, MLTREG, POLREG, DISREG, and VARINZ.

FILES

This is the file manager program. It generates, maintains and displays files of numbers for use by the other programs. A file consists of a set of "observations" each of which is an n-tuple of numbers for a fixed n from 1 to 6. The first numbers in the n-tuples of a file form a data set referred to as "type 1", the second numbers form another data set, "type 2", etc. A file may contain up to 175 observations. This limit may be increased by adjustments of DIM statements in the FILES program (line 30) and in other programs which will use the files.

When FILES is run, the following prompt is displayed:

```
SELECT NUMBER OF DESIRED ACTION:
1)  CREATE FILE
2)  DELETE FILE
3)  ALTER OBSERVATIONS
4)  ADD AND/OR DELETE OBSERVATIONS
5)  DISPLAY FILE
6)  MERGE FILES
7)  END PROGRAM
?
```

1) To create a new file on disk, type "1", followed by a carriage return (CR). The following prompt is then displayed:

```
FILE NAME AND NUMBER OF TYPES:
```

The desired file name (1 to 6 characters) should now be entered, followed by a comma, followed by the number of items/observation. The next prompt is:

```
NUMBER OF OBSERVATIONS:
```

and when answered (followed by CR), the prompt

```
ENTER "0" WHEN DONE
DATA:
#
```

appears. Each observation is now entered by typing first the number of the observation, then (CR), then the numbers for the respective "types" of the observation, each followed by (CR). The observations may be typed in any order and mistakes may be corrected by retyping the numbers of the observation. When finished, type "0" (CR) and the original prompt returns. The new file is now on disk.

2) To delete a disk file, type "2" (CR) and the directory is displayed followed by the prompt:

```
COMPLETE NAME OF FILE TO BE DELETED:
```

The file name followed by ".", followed by file type, followed by ";", followed by version number should now be entered as it appears in the directory, then (CR). The file is deleted (using the screen memory in the process) and the revised directory is briefly displayed before the original prompt returns.

3) To alter observations already in a file, type "3" (CR) and the prompt

```
FILE NAME:
```

appears whereupon the name of the disk file to be altered should be entered. The file is loaded from disk followed by:

```
ENTER "0" WHEN DONE
DATA:
#
```

The corrected observations should now be entered as described above for the same prompt. The file on disk is corrected and the original prompt returns.

4) To add and/or delete observations from a disk file, type "4" (CR) and

```
ENTER "D" (DELETE) OR "A" (ADD) & OBSERVATION NUMBER
ENTER "F,0" WHEN DONE
```

appears. Additions and deletions as well as observation numbers may be processed in any order. To delete an observation, enter "D,", followed by the observation number (then CR). Warning: subsequent observation numbers are now decreased by 1! To add an observation enter "A,", followed by the observation number (then (CR)). Warning: already existing observation numbers from this one up are now increased by 1! When finished, enter "F,0" (CR). A new file of the same name and next higher version number is now placed on disk and the old file remains. The original prompt returns.

5) To display a file which is on disk, type "5" (CR) and the prompt

FILE NAME:

appears to which the name of the desired file (then (CR)) should be entered. This is followed by:

THIS FILE WAS CREATED BY
1 - THE "FILES" PROGRAM
2 - ONE OF THE OTHER STATISTICS PROGRAMS

a) If a "1" is input, the next prompt is

BEGINNING OBSERVATION NUMBER (OR '0' TO END):

When an observation number is typed in, a screen of successive observations beginning with that one is displayed, followed by the same prompt. When finished, enter "0" (CR) and the original prompt returns.

b) If a "2" is input, the file is displayed on the screen but no prompt appears. To return to the original prompt, press "return".

6) To merge two or more files together, type "6" (CR). Files may be merged in one of two ways: files which contain the same number of types may have observations merged, or files which contain the same number of observations may have types merged. The prompt

NEW FILE NAME:

is displayed whereupon the desired name for the merged file should be entered (and (CR)). Next appears

ENTER 1-MERGE OBSERVATIONS OR 2-MERGE TYPES

a) If a "1" is typed, the next prompt is

MERGE FILE NAME (OR "0" IF DONE)

and the name of the first disk file to be merged should be entered (and (CR)). As the names of the successive files to be merged are entered, the prompt MERGE FILE NAME is repeatedly displayed. After the last file name has been entered and the prompt again appears, enter "0" (CR) and the original prompt returns. The merged file is on disk.

b) If a "2" is typed, the next prompt is

FILE NAME & # TYPES TO MERGE (OR '0,0' IF DONE):

The name of the first file to be merged and the number of types from this file to be used in the merge should now be

entered, separated by a comma and followed by (CR). The prompt TYPE 1: next appears and the number of the type (1 to 6) to be merged first is entered (and (CR)). If more than one type is to be used from this file then TYPE 2: appears next, etc. The prompt

MERGE FILE NAME & # TYPES TO MERGE:

is repeatedly displayed as the files to be used in the merge are called for. After all the merge information has been entered and the prompt reappears, enter "0,0" (CR) and the original prompt returns. The merged file is on disk.

7) To return to the MENU program, type "7" (CR).

MLTREG

This program performs multiple linear regression on up to 6 variables (including the dependent variable) with or without transforms.

When MLTREG is run, the following prompt is displayed:

```
ARE TRANSFORMS TO BE USED?
```

If one or more of the variables are to be transformed as a function of any of the variables or is to be made a constant, enter "Y" or "YES", otherwise "N" or "NO". In the former case the following prompt appears:

```
ENTER FUNCTIONS FOR THE TRANSFORMS IN 'BASIC' FORMAT
USING LINE NUMBERS FROM 1000 IN INCREMENTS OF 10
AND V(0) (DEPENDENT VARIABLE), V(1), V(2), . .  FOR THE
REPECTIVE INPUT VARIABLES.  USE X(0) (DEPENDENT VARIABLE),
X(1), X(2), . . . FOR THE RESPECTIVE TRANSFORMED VARIABLES.
FOLLOW THIS BY THE STATEMENT "RUN".
```

```
EXAMPLE:
1000X(0) = V(0)
1010X(1) = 3 * V(1) + V(3) - V(4)
1020X(2) = V(2) - V(5)
1030X(3) = V(3)
1040X(4) = V(5)
1050X(5) = V(5) - 2
RUN

NOTE:  IDENTITY FN. USED FOR X(3) WHERE NO TRANSFORM WAS NEEDED

READY
```

The functions for all the variables are now entered as indicated. Next, or after an answer of "N" or "NO" to the original prompt, appears:

```
DATA SOURCE (F-FILE OR K-KEYBOARD)
```

If the data to be used is in a disk file created by the "FILES" program, then "F" should be entered, otherwise, "K". This is followed by

```
NUMBER OF VARIABLES:
```

and the number of variables to be used, including the dependent variable, is now entered. This must be an integer from 2 to 6.

1) If data is to be entered from a disk file ("F" entered before), the next prompt is

FILE NAME:

to which the name of the file to be used is entered. This is followed by TYPE #1 to which is entered the "type" number (described for "FILES" above) of the values for the dependent variable. The type number of the respective independent variables are next entered to the prompts 'TYPE #2', 'TYPE #3', etc.

2) If data is to be entered from the keyboard, the next prompt is

NUMBER OF OBSERVATIONS:

whereupon the number of n-tuples of data to be used should be entered. This is followed by:

OBSERVATION #, DEPENDENT VALUE, INDEPENDENT VALUES:
#

and data is then entered from the keyboard as is done for the "FILES" program described above.

A pause now ensues as calculations are performed. Afterwards, a screen of statistics will appear, including the regression of the equation. At the bottom of the screen is displayed:

ENTER 1-RESIDUALS, 2-SAVE OR 3-END

1) To display a table of dependent values verses computed values along with the residuals, enter "1" and the prompt

BEG. OBSERVATION #:

appears. Upon entering the desired number, a screen of successive data, beginning with that corresponding to the observation number entered, is displayed. At the bottom of the screen appears

1-CONTINUE, 2-SAVE OR 3-END

To enter another beginning observation number, type "1". The other two alternatives are the same as those in the preceeding prompt.

2) To save the screen in a disk file, type the number corresponding to the "SAVE" alternative and a disk file of the screen is created with the name MLTREG.DSP. This is followed by:

1-RESIDUALS OR 2-END

which offers the same two alternatives as those not selected in the previous prompt.

3)To return to MENU, type the number corresponding to the alternative "END".

POLREG

This program performs polynomial regression using a polynomial of degree up to 5.

When POLREG is run, the following prompt is displayed:

DATA SOURCE (F-FILE OR K-KEYBOARD):

Data, whether from a disk file or from the keyboard, is entered as described for MLTREG above. After the data has been entered,

DEGREE:

appears to which is entered the desired degree of the regression equation. A pause now ensues as calculations are performed. Afterwards, a screen of statistics appears, including the regression equation. At the bottom of the screen is displayed

ENTER 1-SAVE, 2-DRAW GRAPH OR 3-END PROGRAM:

1) To save the displayed statistics in a disk file, enter "1" and a disk file of the screen is created with the name POLDSP.DSP.

ENTER 1-DRAW GRAPH OR 2-END PROGRAM

is displayed next, which offers the same two alternatives not chosen in the preceeding prompt.

2) To display the graph of the regression equation along with the data points, type the number corresponding to the alternative "DRAW GRAPH" and the prompt:

GRAPH NAME:

appears. The name which is to appear at the top of the screen when the graph is displayed is entered now, whereupon the prompt:

X-SCALE NAME, Y-SCALE NAME:

appears. The desired names for the scales are entered, separated by a comma and this is followed by:

X-SCALE (START, END, DIFFERENCE):

The beginning and ending marked scale values and the constant difference is entered, separated by commas. A maximum of 8 values will be displayed so if the constant difference chosen is too small, then the ending value entered will not be displayed. The next prompt to appear is:

Y-SCALE (START, END, DIFFERENCE)

to which parameters are entered for the Y-scale as they were for the X-scale in the preceeding prompt. However, up to 14 marked values may be displayed. The graph is now displayed and at the bottom of the screen appears:

ENTER 1-NEW SCALES, 2-SAVE OR 3-END:

1) To change the scales and redisplay the graph, enter "1" and the prompts to enter the scale parameters return.

2) To save the graph in a disk file, enter "2" and the screen is saved in a disk file with the name POLGR.DSP. The same prompt then reappears.

3) To return to the MENU program, type "3".

DISREG

This program fits binominal, normal or Poisson distributions to input data. A chi-square test for goodness of fit may then be performed. Also, tables of Students' T-, chi-square and the standard normal distribution may be displayed.

When DISREG is run, the following prompt is displayed:

IS DATA TO BE ENTERED?

To merely display one or more of the distribution tables, enter "N" or "NO", otherwise, "Y" or "YES". In the latter case, the prompt:

DATA SOURCE (F-FILE OR K-KEYBOARD):

appears, to which is entered, "F" if the data is to be used is in a disk file created by the "FILES" program; otherwise, "K" is entered. The next prompt is

ARE CLASS MARKS SUCCESSIVE INTEGERS FROM 0 UP?

If the values of the independent variable are 0, 1, 2 etc., then type "Y" or "YES" and these values will not have to be entered. Otherwise, enter "N" or "NO". At this point, data is entered from the disk file or from the keyboard as is done for MLTREG described above. After the data has been entered or a negative response to the original prompt has been typed, the following prompt is displayed:

```
SELECT NUMBER OF DESIRED CHOICE:
1 - BINOMINAL DISTRIBUTION
2 - NORMAL DISTRIBUTION
3 - POISSON DISTRIBUTION
4 - DISPLAY T-DISTRIBUTION TABLE
5 - DISPLAY CHI-SQUARE TABLE
6 - DISPLAY NORMAL DISTRIBUTION TABLE
7 - CHI-SQUARE TEST FOR LAST DISTRIBUTION
8 - END PROGRAM
?
```

If a "1", "2" or "3" is entered, parameters for the corresponding distribution are computed and a table comparing expected frequencies to observed frequencies is displayed. At the bottom of the screen appears the prompt:

```
ENTER 1 TO RETURN OR 2 TO SAVE, THEN RETURN:
```

If it is desired to save displayed data in a disk file, enter "2" and a disk file of the screen is created with the name DISREG.DSP. After the file is created or a "1" is entered to the last prompt, a return to the prompt with the 8 alternatives occurs. If a test for the goodness of fit to the distribution just computed is desired, enter "7". The chi-square test is applied and confidence limits for 4 levels are displayed with an indication as to whether the fit is good, and, if so, whether it is reasonable. A fit which is "too good" should be viewed with suspicion. At the bottom of the screen appears:

ENTER 1 TO RETURN OR 2 TO SAVE, THEN RETURN:

which should be answered in the manner described for the same prompt above. A distribution table may be displayed by typing "4", "5" or "6" to the prompt offering the 8 alternatives to which one of the prompts:

BEGINNING "DF" NUMBER (OR "0" TO RETURN):
or
BEGINNING ABSCISSA (OR "0" TO RETURN):

is displayed. The desired beginning number of degrees of freedom (or beginning abscissa number) is entered and a screen of successive table entries beginning with the number entered (or the closest preceeding number if not a table entry) is displayed with the same prompt at the bottom of the screen. When finished, enter "0" (or "10" for the normal distribution table) and the prompt with the 8 alternatives returns. To return to the "MENU" program, type "8".

VARINZ

This program uses data from a set of samples of varying sizes to compute statistics for each sample, to analyze variance between samples and to provide estimates of the population mean. 4 levels of confidence limits for the population mean or for the population standard deviation may be displayed.

When VARINZ is run, the following prompt is displayed:

DATA SOURCE (F-FILE OR K-KEYBOARD):

This prompt is answered as for MLTREG described above. This is followed by

NUMBER OF SAMPLES:

and the number of samples to be used is entered. If data is to be entered from a disk file ("F" entered to the original prompt), then

FILE NAME (OR "S" IF SAME AS LAST):

appears next. The file name of the disk file containing the data for the next sample is entered, or, if it is the same file as that of the previous sample, type "S". This is followed by

TYPE #

and the type number of the sample data is entered. These last two prompts are repeated until all the sample information has been entered. There now appears

```
ENTER NUMBER OF DESIRED INFORMATION
1 - ANALYSIS OF SAMPLES
2 - ANALYSIS OF VARIANCE
3 - CONFIDENCE LIMITS FOR POPULATION MEAN
4 - CONFIDENCE LIMITS FOR POPULATION STANDARD DEVIATION
5 - END PROGRAM
?
```

1) To display basic statistics as well as an estimate of the population standard deviation mean for each sample, enter "1". The information is displayed and at the bottom of the screen appears

ENTER 1 TO RETURN OR 2 TO SAVE, THEN RETURN

To save the information in a disk file, enter "2" and a disk file of the screen is created with the name VARINZ.DSP. After the new file is placed on disk or a "1" is entered to the last prompt, a return to the prompt with the 5 alternatives occurs.

2) To display an analysis of variance for the samples, enter "2". The information is displayed and at the bottom of the screen appears the same prompt to return or save as described above.

3) To display 4 levels of confidence for the population mean, enter "3" and the information is displayed followed by the return or save prompt as before.

4) To display 4 levels of confidence for the population standard deviation, enter "4". The information is displayed followed by a return or save prompt as before.

5) To return to the MENU program, type "5".

There is a whole library of Sof-Disk Albums available for your COMPUCOLOR II. Most Albums include at least four different programs, and that adds up to a lot of variety! There are financial management packages that guide investments, personal information systems, educational programs for learning at all levels, and much, much, more. Below is a list of just a few of the Albums you can buy. To see them all, visit your nearest COMPUCOLOR II dealer.

OTHELLO	CUBIC TIC-TAC-TOE
MATH TUTOR	BONDS AND SECURITIES
EQUITY	STAR TREK
PERSONAL DATA BASE	BLACKJACK
PERSONAL FINANCE I&II	TEXT EDITOR
CHESS	ASSEMBLER
STATISTICS I-III	SHARKS
SCREEN EDITOR	BASIC LANGUAGE

All software is sold on an "AS IS" basis without warranty.

Compucolor Corporation
P.O. Box 569 Norcross, GA 30071
(404) 449-5961

Statistics II—Regression

$29.95

Requires 16K RAM

FILES: A file manager program that generates, maintains, and displays files for use with the other programs.

MLTREG: Performs multiple linear regression on up to 6 variables (including dependent variable) with or without transforms.

POLREG: This program performs polynomial regression using a polynomial of degree up to 5.

DISREG: Fits binomial, normal or Poisson distributions to input data. A chi-square test for accuracy of fit may then be performed.

VARINZ: This program uses data from a set of samples of varying sizes to compute statistics for each sample, to analyze variance between samples and to provide estimates of the evaluation mean.

Compucolor® Corporation

IMPORTANT INFORMATION

A. For extended media life of your Sof-Disk™—take the following precautions.

1. Do not put fingers on the precision surface.
2. Insert the Sof-Disk carefully into the disk drive.
3. Keep the Sof-Disk far from magnetic field which will erase it.
4. Store the Sof-Disk in the jacket when not in use.
5. Handle the Sof-Disk with care. Bending and folding will damage it.
6. Sof-Disks are best stored at temperatures ranging from 10° to 52°C or 50° to 125°F.
7. Do not leave Sof-Disk in disk drive while turning your Compucolor II ON or OFF.

B. ALL COMPUTER PROGRAMS ARE DISTRIBUTED ON AN "AS IS" BASIS WITHOUT WARRANTY.

Compucolor Corporation shall have no liability or responsibility to customer or any other person resulting from the use of computer programs.