AN ANNOTATED DIRECTORY OF STATISTICAL
AND RELATED MICROCOMPUTER SOFTWARE
FOR SOCIOECONOMIC DATA ANALYSIS

By

Valerie Kelly, Robert D.Stevens,
Thomas Stilwell, and Michael T. Weber

Department of Agricultural Economics
Michigan State University

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PREFACE

There is a worldwide revolution in small computer technology under-way and scientists are struggling to find ways to utilize this new technology to help solve development problems in the Third World. We are pleased to announce a number of papers on microcomputers in international agriculture will be published in our International Development Papers series. The aim of these papers is to provide timely information about the rapidly changing state of the new micro-processing technology and its use in research. The papers are also intended as guides to agricultural and social scientists on choosing, installing, and maintaining microcomputer hardware and software systems in developing countries.

Some of the papers will also document field experiences of selected established projects using new data processing hardware and software. Other papers will concentrate on developing guidelines for establishing and maintaining successful microcomputer and/or programmable calculator installations for agricultural research in developing countries.

The present paper is the sixth of these new papers. It is based on staff work by faculty members and graduate students of the Department of Agricultural Economics, Michigan State University, on cost-effective data collection, management, and analysis techniques for developing country applications. This activity is carried out under the terms of reference of Food Security in Africa Cooperative Agreement DAN-1190-A-00-4092-00, and previously under Alternative Rural Development Strategies Cooperative Agreement DAN-1190-A-00-2069-00, between the Bureau of Science and Technology of the United States Agency for International Development ;and the Department of Agricultural Economics at Michigan State University.

Readers are encouraged to submit comments about these new papers on microcomputers and to inform us of their activities in this area. Write directly to: Dr. Michael T. Weber, Acting Director, Alternative Rural Development Strategies Cooperative Agreement, Department of Agricultural Economics, Michigan State University, East Lansing, MI 48824-1039.

Carl K. Eicher, Carl Liedholm and Michael T. Weber
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A. INTRODUCTION

1. Background

The last three years have witnessed the advent of a large number of increasingly powerful microcomputers and a proliferation of application software for these machines. The wide range of statistical software available makes the selection of appropriate, cost-effective packages difficult, especially with time deadlines and high search costs. In light of these problems, this report has two major objectives: (1) to provide detailed information about comprehensive general statistical software which generally have a price range from $100 to $1,000; and (2) to provide information on other statistical and related software of special interest to those desiring to use microcomputers to conduct socioeconomic data analysis.

For optimal choice of statistical software, information about the following issues is usually necessary: (1) hardware and language requirements; (2) cost; (3) ease of program use; (4) documentation adequacy and ease of use; and (5) source. More technical questions include: (1) the statistical routines included and statistics calculated; (2) data and calculating capacities; (3) accuracy and speed of calculations; (4) flexibility and ease of data management and file use--particularly with respect to ease of data transfer between the statistical package and other programs; and (5) reliability of program operation and warnings about incorrect procedures. In all statistical programs listed in this report, name, cost, source, language and operating system, hardware requirements, and some descriptive information about the programs have been listed. Intensive evaluation is currently underway by MSU staff on six of the comprehensive statistical programs (see footnote to the Index of the Comprehensive Programs). The results of this evaluation will be published in a forthcoming MSU International Development Working Paper.

Although we have attempted to provide a comprehensive picture of software for the most popular microcomputers, new programs will continue to appear. We believe this is a fairly complete report on current programs which are easily obtainable. The information presented has been obtained from promotional material, microcomputer journals, program manuals, reviews, and correspondence with producers and users, as well as from personal experience with some programs.

1

Software development for microcomputers is proceeding very rapidly. Microcomputer statistical software development in the near future will probably: (1) assume the use of larger microcomputer memory (e.g., 128K RAM) and (2) the integration of statistical with more comprehensive data base management, word processing, and graphing routines.

2. Organization of the Report

This report is divided into two major sections. The first section focuses on comprehensive statistical software, and the second on other more specialized (and/or limited) statistical and related software for socioeconomic data analysis.

a. Comprehensive Statistical Software

In this section, we present information on 31 "comprehensive" packages which are easily accessible. These are listed in Table 1 where price, computer, and key analytical features are also identified for each package. To be classified as "comprehensive," these programs generally have to include descriptive statistics, cross-tabulations, correlation analysis, and regression. They often also include analysis of variance, and some minimal graphics. In this section, in addition to providing general information for all packages, we have presented considerable technical information, especially on: (1) the routines included; (2) capacities; (3) data interchange; and (4) whether routines are menu-driven. In each review, we have also listed some positive and negative comments based upon first-hand experience of the authors and others in using the programs, and on references to published reviews of the programs. Sources of information are indicated. Each description in this section may include additional information about the programs, such as sample printouts, graphics, a list of commands, and other technical material.

b. Other Statistical and Related Software
for Socioeconomic Data Analysis

In conducting our review, a number of more specialized and/or limited software programs were also identified which appeared likely to be of interest to agricultural researchers and other analysts. This section describes specialized software for: (1) statistical analysis; (2) trend analyses; (3) survey data processing; (4) graphics; and (5) linear programming. These programs are listed in Table 2 along with price, computer, and key analytical features of each package. The software descriptions (or

Table 1. Comprehensive Statistical Software for Microcomputers

Software Name [c]	Price	Computer [d] Apple	TRS-80	CP/M	IBM-PC	Other	Analytical Features Statistics	Trend Analysis	Survey Processing	Graphics	Page
A-STAT a/	US$175.00	II					X				15
ABSTAT	US$395.00			X	X		X			X	17
AIDA a/ (Apple Interactive Data Analysis, Seattle, Wash.)	US$235.00	II					X				19
AIDA, U.K.	Br$t 450.00	II			E	ITT 2020	X	X		X	23
COMPSTAT	US$1000.00			X			X	X		X	27
DB Master STAT PAK	US$99.00	II					X				28
ELF a/ b/	US$200.00	II		X		Atari	X	X		X	29
Ed-Sci. Statistics	US$95.00	II					X				31
HSD Stats, Anova, Regress	US$247.37	II			X		X			X	35
INTER-STAT	US$99.95	II					X			X	40
IntroStat	US$75.00	II					X				41
MaxiStat	US$199.95		I,III,IV				X		X		42
MicroStat (3.0) a/	US$395.00		II	X	X		X	X		X	43
Number Cruncher a/	US$200.00		I,III	X	X	VIC-20	X				46
SL-Micro a/	US$250.00		II			North Star	X		X		49
SpeedSTAT-1	US$300.00	II	II (any micro with UCSD Pascal)				X		X		52
STAN	US$375.00		II		X		X			X	56
STAR	US$225.00		I		X		X			X	57
Stat Pack I (Trans Systems)	US$295.00						X				60
Stat-Systems		II					X				61
Statistical Analysis (Radio Shack)	US$99.00	II	II				X				62
Statistical Package for Microcomputers (SPM)	US$119.95	II	I,III	E	E	Atari	X			X	63
Statistical Processing System (S.P.S.) a/	US$300.00	II	I,II,III	X	X		X		X	X	66
Statistician, The	US$125.00		I,II,III	X	E		X			X	70
Statistics (Basic Bus. Software)	US$75.00	II					X				73
Statistics with Daisy	US$79.95	II					X	X		X	74
StatPac (Wolnick Assoc.)	US$400.00			E	X		X		X		78
STATPAK (NW Analytical, Inc.)	US$495.00			X	X		X				81
Statpro b/	US$1995	II			E		X	X	X	X	86
Stats Plus b/	US$200.00	II					X			X	91

a/ More detailed evaluations are being undertaken of these packages with attention to accuracy, ease of use, and other factors. They will be published in the forthcoming MSU International Development Working Paper No. 15.

b/ Also has data base management capabilities.

c/ It appears that the following programs are also comprehensive but insufficient information was available to include them in this list: MASS, SAM, Personal Data Analysis, Statistics Pac, MSUSTAT (Montana State University), and Statistical Micro Programs.

d/ E = Expected.

annotations) in this section are brief, compared to those in the "comprehensive" section. There are a large number of packages listed here, most of which we have not examined in the same degree of detail as those in the "comprehensive" section. As can be seen when reviewing Table 2, the packages tend to be more specialized and contain fewer features than those in the "comprehensive" section.

Although some "comprehensive" statistical software have trend (time series) analysis routines, users needing high performance programs for time series analysis may want to consider more specialized programs. The same logic applies to specialized programs for processing survey data. In using these, particular attention should be paid to the type of data files produced to ensure compatibility with the desired statistical software (mainframe or microcomputer). Note that, although many plotting or graphic programs are available, the majority appear to have quite limited flexibility.

3. Comments on Analytical Features

An interesting characteristic of the statistical software identified in the two sections is that the price often has little relation to the quality of a package. There are some US $1000 packages which offer little more than US $200 packages. There are also a few US $200 packages which offer little more than programmable calculators. It is therefore important for potential buyers to read software descriptions very carefully.

Advertising literature generally gives a few details about types of analysis performed plus a few samples of the printout. Almost none give details about data entry procedures, which absorb much user time. As always, it is important for buyers to know as exactly as possible the types of analyses they want to perform and then to look for packages that will carry them out. If a software package is used only occasionally, then a menu-driven package may be adequate; but if it is used daily or weekly, then the user may benefit from the flexibility of a command-driven package. If using only one type of analysis such as regression, then a specialized package may well serve better than a generalized one.

A number of highly specialized programs appear to have advantages for users with a heavy load of statistical analysis. These include the following software (also shown in Table 2): ANOVA II, LOLITA, Sample Calc, STAT POWER, Statmanager, Stat Plus, Statistics (Keller Software), and Stepwise Multiple Regression.

Table 2. Other Statistical and Related Software for Socioeconomic Data Analysis

Software Name	Price	Computer					Analytical Features					Page
		Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	
1-2-3 a/					X		X			X		94
16K Finance System	US$20.95											94
Advanced Statistical Analysis	US$39.95		I			Sinclair	X	X				94
Analysis I	US$49.95	II					X	X				94
Analysis of Variance	US$4.95		I,III	X			X	X		X		95
ANOVA II	US$150.00	II					X					95
APLOT	BrSt 380.00			X						X		96
Apple Data Graph	US$400.00	II								X		96
Apple III Business Graphics	US$175.00	III								X		96
Apple Plot	US$70.00	II						X		X		96
Apple Statistics	US$95.00	II					X					97
Applied Statistics	US$55.95	II		X		Zenith, Heath	X					97
Autograf	US$195.00	II		X						X		97
BANOVA-1	US$4.95		I				X			X		97
BANOVA-2	US$4.95		I				X					98
Bar Chart Creator	BrSt 15.00					ITT 2020				X		98
Bar Graph	CN$25.00					PET				X		98
Barchart Simulator	BrSt 420.00					PET				X		98
Bargraph	US$3.00				X	Sinclair				X		98
Basic Statistical Package	US$225.00						X					99
Basic Statistics	CN$23.95					North Star	X					99
Basic Statistics	US$90.00		I	X		PET	X					99
Basic Statistics Package	BrSt 15.00					PET	X					99
Basic Statistics Package II	BrSt 15.00					PET	X					99
Bestline and Least Squares	BrSt 10.00					PET	X	X				100
Biz-Vu	US$29.95				X		X					100
BMDP	US$1000.00					STATCAT				X		100
Box-Jenkins Forecasting Model	US$99.00		II					X		X		100
Busi-Graph	US$125.00	II			X					X		100
Business Graphics	US$175.00	II			X			X		X		101
Business Graphics Package	US$145.00			X						X		101
Business Graphics System	US$475.00			X						X		101
Business Graphics-Analysis Pak	US$174.95	III						X		X		102
Business Management III	US$110.00	II		X		HP Series	X			X		102
Business Management VII	US$100.00	II		X		HP Series						103
Business Planning Package	US$99.00	II						X				103
Business Stat. & Marketing	US$19.95					PC-1	X	X		X	X	103
Calculator I	US$19.95		I				X					103
Chart Pro	US$95.00									X		104
Chart-Master	US$375.00	II,III							X	X		104
Chartman	US$380.00				X					X		104
Complete Graphics System II	US$69.95	II			X					X		105

(continued)

Table 2. (continued)

Software Name	Price	Computer					Analytical Features					Page
		Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	
Context a/	US$695.00				X		X			X		105
CURFIT	BrSt 4.80											105
Curve Fit	US$16.45	II				PET	X			X		106
Curve Fit	BrSt 7.00					PET	X			X		106
Curve Fitter	US$34.95	I				PET				X		106
Curve II	US$275.00	II								X		106
Curve Program	US$199.00		III			Atari, PET				X		107
Daisywheel Plotting Software				X		Zenith, Heath				X		107
Data Plot	US$59.95	II								X		107
Data Reporter	US$220.00	II					X			X		107
Data Smoother	US$23.95		I	X		Heath, Delta	X			X		108
Data-Graph	US$49.95	II				PET				X		108
Data-X	BrSt 350.00											108
Dataplot				X		Zenith, Heath	X			X		108
Datagraph Stat. Display System	US$24.95	I,II		X						X		109
Dataplot	US$60.00	II		X		Zenith, Heath				X		109
Descriptive Statistics AP-7 Comp.	US$200.00						X					109
Descriptive Stats. & Reg. Analysis	US$400.00						X					109
Draftsman	US$150.00	II		X	X					X		110
ELF/ARIMA	US$400.00	II		X		Atari		X				110
Exploratory Data Analysis	US$95.00	II		X			X					110
Factor Analysis	US$99.95		III	X			X					111
Factor Analysis	US$125.00		III	X			X					111
Farm Soft Linear Program	Free			X			X				X	111
FARMAP	US$299.95								X			112
Fast Graphs					X			X		X		112
Financial Modelling	US$9.95				X	Sinclair		X				112
Forcast												112
Forecast	BrSt 10.00	II				PET		X		X		112
Forecaster II	US$29.95	II						X		X		113
Forecasting Group								X				113
Future	US$59.95	I,III						X				113
GASP	BrSt 500.00			X		HP 83, HP 85	X		X			113
General Stat. Application Pac	US$95.00			X		Osborne	X					113
Grafiks	US$125.00			X						X		114
Graftalk				X						X		114
Graph		I								X		114
Graph Creator	BrSt 15.00	II				ITT 2020				X		115
Graph Fit	US$25.00	II								X		115
Graph It	US$19.95					Atari				X		115
Graph Pak	US$270.00									X		115
Graph Plot				X		Zenith, Heath				X		116

(continued)

Table 2. (continued)

Software Name	Price	Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	Page
Graph Plotter	US$7.00					Sinclair				X		116
Graph Plotter	BrSt 30.00					Vid. Genie				X		116
Graph Power	US$295.00						X			X		116
Graph'n'Calc	US$249.00	II		X	X					X		117
Graphic Package	BrSt 12.00				X	PET	X	X		X		117
Graphics Generator	US$195.00				X					X		117
Graphics Presentation Pac	US$250.00					HP-87				X		118
Graphit	BrSt 80.00		I,II							X		118
Graphkit	US$179.00	II		X		PET	X			X		118
GUYL Statpak	Free	II					X					118
HAC LP	US$95.00	II									X	119
HAL3001	US$25.00	II			X		X			X		119
Higraph	US$29.95				X					X		119
Histo-graph		II								X		120
Histogram	US$5.95	II				Sinclair				X		120
Histogram Plot	US$39.00									X		120
Histogram Plotting	US$100.00		I	X						X		120
Histograph/Scattergraph	US$59.95									X		121
Histokit	BrSt 40.00		I			PET	X			X		121
INOUSTAT	US$1595.00	II		X			X	X				121
Interactive Statistics		II					X			X		121
Interstat	BrSt 150.00	II				ITT 2020	X					122
ISIS	US$250.00	II					X					122
Keystat	US$130.00	II					X					122
Lab Statistics Package	US$50.00	II										122
Linear Programming	US$25.00		I,III	X							X	123
Linear Programming	US$95.00		I,III								X	123
Linear Programming	US$45.00		I,II,III								X	123
Linear Programming	Free	II	I,III								X	123
Linear Programming	US$25.00										X	124
Linear Programming	BrSt 8.00					PET					X	124
Linear Programming v.4.1	US$20.00		I								X	124
Linear Regression	BrSt 25.00					PET	X					124
Linear Regression	US$25.00						X					125
Linear Regression	US$90.00		I	X		North Star Vid. Genie	X					125
Linear Regression	BrSt 5.00					PET	X	X				125
LOLITA				X	X				X			125
LP Master	US$495.00			X							X	126
LP/80	US$59.95		I,III								X	126
Market Charting Package	US$450.00			X				X		X		126
MASS		II		X			X			X		127

(continued)

Table 2. (continued)

Software Name	Price	Computer					Analytical Features					Page
		Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	
Math/Stat Disk System	US$75.00		I,II,III				X			X		127
MDC STAT				X			X			X		127
MDC STAT				X			X			X		127
Micro-Graf	US$35.00				X					X		127
Micro-TSP	US$250.00	II					X	X		X		128
Micrograph	US$395.00	II								X		128
MICROLP	BrSt 200.00					Vector MZ					X	128
Microplot				X						X		128
Microquest	BrSt 16000.00	II					X		X			129
MicroSURVEY	BrSt 1200.00	II	III		X		X		X			129
MirrorGraph										X		130
Moving Average	BrSt 5.00					PET	X					130
MSUSTAT	US$750.00			X			X			X		130
Multilinear Regression	US$28.94		I,III			Atari	X					130
Multiple Factor Analysis	US$149.95	II					X					131
Multiple Regression	US$59.00				X		X					131
Multiple Regression	BrSt 45.00				X	PET	X					131
Multiple Regression	US$39.95	II					X					132
Multiple Regression	BrSt 50.00	II					X					132
Multiple Regression 1.0	US$50.00		I,III				X					132
Multiple Regression 2.0	US$70.00		I,III				X					133
Multiple Regression Analysis	US$55.00		I				X					133
Multistat	US$290.00				X	PET	X					133
Multivar	BrSt 125.00	II					X	X		X		133
Nisscast	BrSt 379.00				X			X		X		134
Olistat	FF 1000.00	II				Olivetti	X					134
Omnigraph	US$49.95	II								X		134
Omnitrend	US$59.95	II					X	X		X		134
One-Way Analysis of Variance	BrSt 500.00		I,III	X		ITT 2020	X					134
Optimizer	US$200.00	II					X			X	X	135
Pairstat	US$150.00	II			X		X	X	X		X	135
Personal Data Analysis	BrSt 125.00	II					X	X				135
Personal Stats	BrSt 195.00	II					X					136
PERT/CPM	US$450.00	II			X						X	136
PFS:Graph	US$125.00				X					X		136
Plan 80 a/	US$495.00	II								X		137
Plot II	US$44.95				X					X		137
Plotrax	US$235.00				X		X			X		137
Plotware Z	US$399.00			X						X		137
Polynomial Progression	US$5.95					Sinclair	X					138
Predictor	US$29.95	II						X				138
Prime Plotter	US$240.00	II						X		X		138

(continued)

Table 2. (continued)

Software Name	Price	Computer					Analytical Features					Page
		Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	
PRO-GRESS	US$50.00					PET	X					139
PTPLOT+CLUSTER + GROUP DISPLAY	US$100.00			X			X					139
Randomized Complete Block Design	BrSt 500.00					ITT 2020	X					139
Regress	BrSt 15.75		I,II			Vid. Genie	X					139
Regress/80	US$49.95		I,II				X					140
Regression I	US$19.95		I			Atari, PET	X					140
Regression II (Parafit)	US$126.45		I			Atari, Delta	X					140
SAE		II					X					140
SAFOR Sales Analyst and Forecaster	US$21.50		I				X	X		X		141
Sales Forecast	US$16.95	II					X	X		X		141
SAM	BrSt 335.00	II				PET						141
Sample Calc	US$60.00	II							X			141
Scientific Plotter	US$25.00	II								X		142
Scientist	US$99.95	II					X			X		142
Simplex Linear Programming	US$9.95+					OSI	X				X	142
SNAP	BrSt 645.00			X			X		X	X		142
STADT	Free					HP-9845B	X					143
STAPL	BrSt 190.00			X			X					143
Stat Power	US$50.00	II					X					143
Stat-Pac	US$40.00		I,II,III	X			X					144
Statistical Analysis	US$19.95						X					144
Statistical Analysis Group		II					X					144
Statistical Analysis Group		II					X					144
Statistical Distribution Pack	BrSt 7.00					PET	X					144
Statistical Package I	BrSt 22.95		I				X					145
Statistics	BrSt 10.00					PET, ITT 2020	X					145
Statistics	BrSt 7.00					PET	X					145
Statistics	US$29.95	II				Atari	X					145
Statistics	BrSt 19.95	II				Sinclair	X					146
Statistics	US$9.95						X					146
Statistics (BIO) II	US$60.00	II					X					146
Statistics I	US$19.95					Atari	X					146
Statistics Library	US$1500.00					HP 85, HP 9826	X					147
Statistics Pac	US$99.95	II					X					147
Statistics Pac	US$100.00	II	I,III				X					147
Statistics Package	BrSt 40.00	II					X					147
Statistics Package	US$50.00			X			X			X		147
Statistics Package I	US$24.95	II	I				X					148
Statistiques	FF 2500.00					Canon	X					148
Statmanager	US$249.95						X			X		148
Statpak			I	X		Heath	X					148
Stats	US$6.95		I	X			X					149

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Table 2. (continued)

Software Name	Price	Computer					Analytical Features					Page
		Apple	TRS-80	CP/M	IBM-PC	Other	Statistics	Trend Analysis	Survey Processing	Graphics	Linear Programming	
Stats-Graph	US$200.00			X			X			X		149
Stattest	US$33.95		I,III			Zenith, Heath	X					149
Stepwise Multiple Regression	US$139.00		I				X					149
Stepwise Multiple Regression	US$150.00						X					150
SuperPlot	US$69.95	II								X		150
Superplotter	BrSt 8.00	III					X			X		150
Survey Analysis	US$23.00					PET			X			151
Survey Analysis		II							X			151
Survey Data Processing Sys. (1.1)	Free			X		North Star	X		X			151
Survey System	US$495.00				X				X	X		151
Survey System	US$450.00				X		X		X			152
Survtab	US$180.00				X				X			152
T-Test B	US$4.95		I				X					152
T-Test W	US$4.95		I				X					153
T/Maker	US$275.00			X					X			153
Tape Manager & Adv. Statistics	US$24.95		I				X					153
Technical Analysis Package	US$89.95		II				X	X				153
Time Series & Statistical System	US$120.00					North Star	X	X		X		154
TIMSER	US$300.00		I,II,III					X		X		154
Trend-Spotter	US$175.00	II						X		X		154
TWG/ARIMA	US$300.00	II						X		X		155
Ultra Plot	US$70.00	II								X		155
Variance Analyzer	US$14.95					Sinclair	X					155
VisiPlot	US$200.00	II			X		X			X		155
Visitrend/Visiplot	US$300.00				X			X		X		156
WANOVA-1	US$4.95	I					X					156
XYPLOT-BARPLOT				X						X		156
X-Y Vector Plot Package	US$249.00			X		Zenith, Heath				X		156

a/ Integrated Spread Sheet with graphics and data management capabilities.

There is very little software available to assist experimental design or for analysis of experimental data. Nearly all of the software is written for analysis of social science data. Although there are several packages that can accept and analyze experimental design data, they are relatively complicated to use and do not employ vocabulary or formats familiar to experimental design users. For this and other reasons, a group of agricultural scientists at The Agricultural University of Norway and at Michigan State University have developed "MSTAT," which is comprehensive for experimental design, data management, and statistical analysis. Preliminary versions of the program are being tested in Michigan, Norway, and Peru. A brief description of "MSTAT" is included in Annex 1 of this report. The expected release date for the program is January 1984. It will be made available in Third World Countries through USAID and other donor development projects.

a. Trend Analysis Functions

Software with trend analysis functions consist of packages expressly written for analysis and/or forecasting of econometric time period data such as prices or volume of product. A package has been noted as performing trend analysis functions if the vendor's literature stated that the software is intended for trend analysis use. In other cases, a trend analysis function is noted if special features are included such as (1) Box-Jenkins analysis; (2) extensive regression analyses; (3) extensive curve smoothing or transformation abilities; and (4) other specialized functions such as seasonal adjustment or spectrum analysis. Stock market packages have not been included: although technically these have trend analysis functions, they are not relevant for most developing countries. Trend analysis packages of particular interest include Micro TSP, Speed STAT-4, TWG/ARIMA, EAST/ARIMA, and VISITREN/PLOT.

b. Survey Data Processing Functions

Survey data processing features are found in comprehensive and/or specialized statistical packages, and in stand alone packages that have the capability to enter, check, easily edit, store, recall, and redefine survey data. There is frequently little information available about the data entry procedure. This is unfortunate since most of the time spent in survey data processing is for data entry. There is likewise little information about data cleanup facilities. Most of these software packages offer routines for data

entry, data cleanup, and limited summary functions such as cross-tabulation or descriptive statistics. For many small surveys, this would be adequate. For more complicated analysis, it is important that the package be able to pass its data files on to another statistical analysis package.

Nearly all of these packages are limited in the number of questionnaires or questions that can be processed. A few have the ability to process large volumes of data but these tend to be more difficult to operate. Programs noted of particular interest include ISIS (Interactive Statistical Inquiry System), Microquest, Micro Survey, Personal Data Analysis, SNAP, Survey Data Processing, and the Survey System.

c. Graphics Functions

Graphics functions include the ability to produce line charts, bar charts, pie charts, or scatter plots. We have not reviewed programs to produce slide show, animation, or lettering graphics. Many statistical packages include bar chart or scatter plot output but frequently the quality is minimal. Many graphics packages also include statistical features such as linear regression and polynomial curve fitting. Some graphics packages are general purpose and will produce a variety of charts with many fine adjustments and text styles.

Certain key features should be kept in mind when looking for a graphics package. The first is the ability to produce a chart on a wide variety of dot matrix printers and pen plotters. If the user cannot get replacement pens for a plotter, at least black and white charts can be produced on a dot matrix printer. The second important feature is the ability to add text in different fonts or styles of letters. Many times you can design your own symbols or add non-English alphabets such as Arabic or Devnagri. This feature greatly enhances the appearance of charts. Even simple bar charts appear hand-drawn when fancy letters are used in the title.

An important difference among graphics packages should be noted. Most graphics software produces a paper copy using screen dump subroutines. The video screen image is reproduced on paper. Usually this results in "blocky" circles or "stepped" curves and lines. The smoothness of the curves depends entirely on the smoothness of the lines produced by the computer on the monitor. No change of printers will improve the paper copy. The best quality charts are produced by pen plotters. These do not reproduce the

screen image but actually draw the chart again using special subroutines written for a specific plotter. Lines and circles appear to be smooth and continuous. Different colors can be used simply by changing pens. If the user needs charts similar to hand-drawn graphs, be sure to get a plotter package that will interface with your plotter or vice-versa. Also, order lots of plotter pens since they dry out fast in the dry season. If you do not need high resolution charts, a dot matrix printer will do very well. There are even color dot matrix printers on the market now.

d. Linear Programming Functions

The list of linear programming software is incomplete. It is likely that a number of programs exist in colleges and universities just waiting for someone to ask for a free copy. The programs included here are generalized LP packages. Specialized LP packages for livestock rations, scheduling, et cetera, have not been included.

The advertising literature for LP packages is remarkably free of details about the software. In many cases, it was impossible to learn details about a package (e.g., limits on numbers of variables or the types of results produced). Fortunately, many LP packages are relatively inexpensive.

B. DESCRIPTIONS OF COMPREHENSIVE STATISTICAL SOFTWARE

PROGRAM NAME: A-STAT

DESCRIPTION:

<div align="center">

A STATISTICAL ANALYSIS
AND FILE MAINTENANCE SYSTEM
FOR THE APPLE II^{TM} MICROCOMPUTER

As a Subset Language of P-STAT^{TM} 78...
Version A-STAT^{TM} 79.6 (1981) includes:
FREQUENCIES, BI-VARIATE TABLES: CHI SQUARES,
CORRECATION MATRICES, MULTIPLE REGRESSION,
RESIDUALS, APPLE PLOT INTERFACE,
APPLE FILE CABINET INTERFACE, FILE SORT,
AGGREGATION, REPORT WRITING, COMPLETE
TRANSFORMATION LANGUAGE, and READS VISICALC FILES.

</div>

Version A-STAT 79.6C (compiled version), 1982 requires 64K and operates much more rapidly and has added: ANOVA, including T-test, a DIF interface. Command driven. Data entry and editing.

Version A-STAT 83 (compiled version on 3 disks) planned for June 1983 will add 1) factor analysis with up to 45 variables, 2) a command writer to automatically write A-STAT commands and 3) Histograms and Scattergrams. Maximum of 2,000 records per disk.

HARDWARE: Apple II, IIe, 48K, one drive, CP/M version of A-STAT 79.6C expected to be available in April 1983.

LANGUAGE: Machine. Uncompiled (BASIC) version also included.

AVAILABILITY: Rosen Grandon Associates
7807 Whittier Street
Tampa, Florida 33617
(813/985-4911)

PRICE: $175-Version A-STAT 79.6C
(includes uncompiled version)

COMMENTS: Valerie Kelly and Bob Stevens have some experience using A-Stat for analysis of small data bases. Regression routine uses path analysis and beta coefficients. Data handling and transformation capabilities extensive. Uses standard DOS Text Files and EXECS. Interfaces with Apple Plot, and File Cabinet. Review in _Infoworld_ 4:16, Apr 26, 1982, pp. 36-38. More information about a A-STAT available in Staff Paper #83-14. Comparisons with seven other programs in Staff Paper #82-32.

SOURCE OF INFO: From manual and Rosen Grandon correspondence.

A-STAT ... is a general purpose statistical package for
... ro-computer. This system is subset language
of the pop... min-frame package. A-STAT is a package
designed to optimize the power of the micro by employing many
main-frame design concepts. Data it processed from DOS files,
increasing the capacity of the system to as many as 45 variables
for each of 2,000 cases (one disk full of data). This differs
from the in-core processing approach of most current micro-based
statistical packages. A-STAT is ideal for market research, survey
analysis, social and economic modeling, simulations, teaching
statistics, or any of countless research applications.

Statistical procedures currently implemented include:

DATA: for file definition and descriptive statistics (good
N, sum, mean, standard deviation, minimum, and maximum).

FREQ: for frequency distributions (counts, percents,
cumulative percents).

TABLES: for bivariate frequency distributions (cell counts,
row percent, column percent, total percents, expected
values, cell Chi-squares, overall Chi-Square and exact
probability of Chi-square.

CORRELATE: for the creation of square correlation matrices
(means, standard deviations, pearson-product-moment
correlations, and good N). Up to 15 by 15 matrices can be
constructed.

REGRESSION: for mult... gression and path analysis of
linear combinations ... variables (simple correlations,
standardized regression weights - beta's, non-standard
regression weights and intercept, standard error of
regression weights, exact significance level of
regression weights, multiple correlation coefficient,
R-Square, R-Square adjusted for shrinkage, standard
error of estimate, complete Analysis of Variance table
with sum of squares for regression and error, the F-test
for the equation, and the exact probability of F).

NO.OP: for permanent file modification, variable transfor-
mations, and descriptive statistics file production.

JOIN: for the merging of data files (up-down , and left -
right).

LIST: for the formatted displaying of files and report gen-
eration. Columnar tables are printed from data files and
statistical description files.

READ.FILE.CABINET: for file maintenance, data entry and
report writing facilities, this procedure converts the
Apple Computer Corporation's File Cabinet Program Data-
bases into A-STAT system files for statistical analysis.

WRITE.FILE.CABINET: converts A-STAT system files into file
Cabinet Database files for use with the Apple Computer
Corporation's File Cabinet Program.

Each major procedure has access ... STAT's variable
transformation language. Variables may be combined using
such operations and functions as ordinary arithmetic
(+,-,*,/,**) case delete, sine, cosine, log, and random
numbers. Arithmetic can be based on outcome of logical
transformation language:

(i.e. IF INCOME EQ 1 SETI NEWVAR TO OLDINE + OLDTWO).

All procedures account for missing values and understand
"weight" variables.

A-STAT 79 will run on any standard Apple II or Apple II
plus with 48K of storage. One or more disks are required. A
printer is very useful but not essential. Output widths are
adjustable from 40 columns up. Execution can be either fully
interactive or EXEC driven for batch-like operation.

Other currently available software for the Apple II
include: MOVE370, a file moving program for interfacing IBM
370's and Apples, and IBMPRINT, a file printing utility for
printing files containing ANSI carriage control.

A-STAT 79 is offered complete with 80 page manual from
Rosen Grandon Associates; 296 Peter Green Road; Tolland,
Connecticut 06084. Introductory prices are $125.00 for the
complete system and one manual, and $10.00 for each additional
manual. MOVE370 and IBMPRINT are available on disk with
instructions for $25.00 each.

SAMPLE A-STAT 79 OUTPUT

PROGRAM NAME: ABSTAT (Version 2.23)

DESCRIPTION: ABSTAT^{TM} IS UNLIKE ANY OTHER STATISTICS PACKAGE.
                   Command driven with help message system. It is fully
                   interactive to provide professional statistical rou-
                   tines in a friendly manner. ABSTAT^{TM} includes facili-
                   ties that permit reading and writing of ASCII files,
                   making formal reports, accessing disk directories, and
                   batch processing for all or part of the analysis.
                   Data may be transformed with user defined equations
                   that allow use of relative case numbers and condi-
                   tional constraints.   Data sets may be built   or
                   expanded from existing data files using algebraic and
                   conditional criteria. Editing and input of data is
                   fast and efficient, permitting direct access to any
                   data item by case or variable.   Statistics include
                   multiple regression, analysis of variance, cross tabu-
                   lations, chi square, bar graphs, scatter plots, means
                   test, descriptive statistics, Spearman rank correla-
                   tions, and more. In addition, ABSTAT^{TM} executes 5 to
                   10 times faster than packages written in BASIC.

HARDWARE: ABSTAT^{TM} requires at least 56K,
                   CP/M, an 80 character wide terminal, and 240K of total
                   disk storage, or at least 2 drives. New release
                   expected April 1, 1983 for IBM-PC.

LANGUAGE: Machine

AVAILABILITY: ANDERSON-BELL
                   425 Main Street, Suite 10
                   Canon City, CO 81212 (303/275-1661)

PRICE: $395 including manual and $25 for the manual alone.

COMMENTS: Files in dBase II format can be read and written.
                   Batch runs made by using a command file.   Up to 20
                   variables specified by name or number. Capacity, with
                   64K of memory, approximately 4,000 cases divided by
                   the number of variables. Review InfoWorld June 13,
                   1983, pp. 45-48.

SOURCE OF INFO: Promotional material, February 1983.

ABSTAT IS-

ABSTAT is in use around the world on more than 20 makes of CP/M based computers. Our customers include many major corporations and universities who are using ABSTAT in insurance, manufacturing, marketing, medical research, mining, petroleum, pharmaceuticals and transportation.

ABSTAT has been designed to make the most of human and computer resources. Its fast processing speed and ease of use make it an ideal tool to perform exploratory data analysis.

ABSTAT Is Simple

Previous computer experience is not necessary, you don't have to learn a language or follow complicated procedures to install or use ABSTAT. ABSTAT is command driven and fully interactive. Whenever you have a question of a procedural nature you may simply type a "?" to get a helpful message.

ABSTAT Is Flexible

ABSTAT includes commands that facilitate data manipulation in a comprehensive but simple manner. You may input data from the keyboard with the included editor by either case or variable. You may append cases or add variables to your data using another file as input You may even build a new data set from other files using algebraic transformations with conditional constraints. ASCII data files can easily be read or written so that data can be shared with your other programs. Files in dBase II format can also be read and written. Transformations can be accomplished with user defined equations which may include relative case numbers allowing you to define custom smoothing or time series functions. Up to 5 conditional constraints may be applied to your transformations. Keyboard input can be assigned to a command file if you have need to perform iterative runs using the same commands or wish to define special transformation functions. Virtually all or any part of ABSTAT can be run in a batch mode using this procedure.

ABSTAT Is Comprehensive

ABSTAT provides many procedures from Descriptive Statistics, Analysis of Variance, Chi-square Correlations, Cross tabulations, Multiple Regressions and more to assist you in your data analysis.

ABSTAT Is Supported

Anderson - Bell is committed to the continuing support of ABSTAT and will be adding many new features and procedures in the future. Because of this, Anderson-Bell will provide each licensed user of ABSTAT with one free copy of the first release following purchase and will make future releases available at a nominal fee for copying and handling.

SUMMARY OF COMMANDS

DATA SET COMMANDS

APPEND	Append data from another file using logical conditions
BUILD	Transform a variable from another file using transformations and logical conditions
CREATE	Create a new data file
DBREAD	Read file in dBase II format
DBWRITE	Write file in dBase II format
EDIT	Edit an existing data file or input from keyboard
FETCH	Read in an existing data file
PRINT	Print data set or selected variables and cases
PULL	Add variables from another file using logical conditions
RAND	Provides uniform or Gaussian random number generation
READ	Read ASCII data file
SAVE	Save memory data set on disk file
SORT	Sort data by primary and secondary variables
TRAN	Transform selected variables using algebraic equations and logical conditions
WRITE	Write in ASCII data file

STATISTICAL COMMANDS

ANOV1	One way analysis of variance with replications
ANOV2	Two way analysis of variance
CHIFIT	Chi Square goodness of fit test
CONTIG	Chi Square 2 way Contingency table
CORR	Correlation coefficients, (r) matrix.
DESC	Mean, standard deviation, variance, standard error of mean, coefficient or variation
DESC1	DESC plus median, mode, minimum, maximum, range
DESC2	DESC1 plus skewness, kurtosis
FREQ	Lists values, frequencies, percents, and Z scores
MANN	Mann-Whitney U test
MDIFF	t test for the differences between means of two variables
MEANT	t test for difference between sample and population mean
PAIRT	t test for paired observations
PROB	CHI, TTEST, FTEST, POIS, BIN probability commands
REGR	Simple and multiple linear regressions
SRANK	Spearman rank correlation matrix
XTAB	Cross tabulation
ZSCOR	Lists values, frequencies, percent, and Z scores

GRAPHICAL OUTPUT

BARG	Prints bar graphs, manual or automatic ranges
PLOT	Scatter plot

REPORT COMMANDS

PON	Assigns report output to printer or disk file (132 columns)
PON 80	Assigns report output to printer or disk file (80 columns)
POFF	Assigns all output to terminal (80 columns)
DATE	Set date to print on report headings (12 characters, any format)
TITLE	Set title to print on report headings (64 characters, any format)
TEXT	Include documentary text from a file

MISCELLANEOUS

COMM	Assigns keyboard input to a command file
DIR	View full or selective disk directories, similar to the CP/M command
QUIT	Returns you to CP/M
!	Permits the safe exit from any command
?	Provides help when questions of a procedural nature arise.

PROGRAM NAME: AIDA – Apple Interactive Data Analysis, AIDA Encore, AIDA Banner, AIDA-AID

DESCRIPTION: The U.S. AIDA; one of two statistics packages with the same name. A full-featured, command-oriented statistical analysis package for the Apple II: Data manipulation: transforms, case selection, missing data, case weights Descriptive statistics: means, variances, ranges, percentages, bar charts Bivariate analysis: tables correlation, rank correlation, pair and standard t-tests, ANOVA (all with significance levels). Multi-variate analysis: multiple linear regression with up to twelve independent variables. Convenience features: virtual memory access to disk variable files. Number of data points is limited by disk storage. Over 11,000 data points in 48K of memory (16,000 on 64K), output to printer or disk, EXEC files, enter and verify, text file input, error handling, a HELP command, variable labels. Handles missing values. Statistical accuracy: all sums of squares done with provisional means algorithms

HARDWARE: Apple II, 48K, one or more disk drives or Corvus hard disk drive

LANGUAGE: BASIC

AVAILABILITY: Dr. David A. Lingwood
Action-Research Northwest
11442 Marine View Drive, S.W.
Seattle, Washington 98146
(206/244-9360)

PRICE: AIDA $235 (20% discount for students), AIDA Encore $50.00, AIDA Banner and AIDA-AID together $150.

COMMENTS: Appears particularly good for field surveys. Standard DOS files used. No selective printouts. Data entry and manipulation work well. Low resolution histograms, scatter plots of 2 variables. User can add own rounties. Infoworld Review, March 21, 1983. Infoworld reviewer tested most of the routines with small and large data sets against mainframe results. AIDA results correct. No utility for reading data from standard Apple text files. Ratings "good," documentation, "fair." Integer format for data (Range + 32766) with decimal place specified.

SOURCE OF INFO: Letter, February 1983 and Infoworld

Statistics?.. on an Apple ?

YES INDEED!

AIDA: Apple Interactive Data Analysis

AIDA is a command-oriented statistical analysis 'package' for the Apple II. It provides the data manipulation and statistical commands commonly needed in commercial or academic social science and marketing research. It is at home in other fields of research, as well — anywhere the analyst must deal with large quantities of information. Time lag transformations and a powerful regression package make it useful in economics, too. Its statistics cover the range from descriptive, through bivariate, to multivariate techniques, with case weighting.

Analyses can be done on sub-sets of cases, selected either by case number or data values. Data may be transformed several ways, including any legal Applesoft statement. Data are entered either from the keyboard (with prompting), or from disk text files. Missing data, print to disk or printer, and user-written routines are supported.

AIDA allows up to 11,000 data points in memory at once (e.g., 500 cases by 22 variables), with a maximum of over 4,000 cases. A 'virtual memory' system recalls variables from separate binary disk files as they are referenced during analysis; this permits larger data files (up to 254 variables) than the computer can hold in memory. Program overlay lets AIDA run in under 8K.

The price of the AIDA program is $235.00, with a 20 per cent student discount available. This includes the open-DOS 3.3 program disk, one protected 'boot' disk, and over 50 pages of documentation and sample output. A second boot disk is provided, free of charge, upon receipt of the purchaser's agreement. Further replacement disks are provided on an exchange basis for $10.00. Dealer rates available.

(All programs require 48K or larger Apple II with Applesoft, and at least one disk drive. Washington State residents add 5.4% sales tax.)

* Apple II is a registered trademark of Apple Computer, Inc.

THE AIDA COMMANDS

CASES	CLEAR	CORRELATE
DATA input	DESCRIBE	EDIT
FINISH	FREE	HELP
HISTOGRAM	KEEP	LIST
MEANS (ANOVA, n)	MISSING	MULT regression
ONEWAY	PAIRwise case	PRINT
RBLOCK	RCORR	READ tab
RMEANS rank ANOVA	SAVE	SCATterplot
SPECIAL	STATUS	(or HIRES)
TWOWAY	WEIGHT	TRANSFORM

The AIDA 'Encore' Package

This disk contains several programs designed to work with AIDA, but useful on their own, as well:

REL	Item Analysis and Index Construction. Tests inter-relation of test items, working from a variance-covariance matrix (up to order 100). Features item-to-total correlations, Cronbach's alpha, inter-index and index-to-item correlations.
SORT	Text-Sorting Utility Program. For text files.
INVEN	A 'card image' file data deck inventory that produces frequencies and percentages.
DATA	A case-wise version of AIDA's data input routine. Permits building text files of up to 254 variables per case, unlimited cases. Prompts for variables by number and label; verification capability.

The Encore Package is available, on unlocked DOS 3.3, for $50.00, $40.00 if ordered with AIDA.

AIDA Banner and AIDA-AID

This disk contains two specialized programs. BANNER produces crosstabulation tables, with multiple column variables, upper and lower case headers and extensive variable and code labels. AID, or 'Automatic Interaction Detection' is an algorithm for multivariate analysis. Both programs read AIDA data files, and are contained on one DOS 3.3 disk for $150.00.

ACTION-RESEARCH NORTHWEST

11442 Marine View Drive, S.W., — Seattle, Washington 98146 — (206) 241-1645 — Source: CL 2542

Sample AIDA Output

PROGRAM NAME: AIDA - Apple Interactive Data Analysis

DESCRIPTION: The U.K. AIDA; one of two very different programs with the same name. Menu driven. Emphasis is on time series analysis but there is a facility to handle cross sectional data. Ordinary least squares, multiple regression, 2 stage L.S., auto-regressive estimation technique (Cochrane-Orcutt). Linear, log, and quadratio functions estimated by OLS and report writing. Comprehensive color graphing up to 4 series, data manipulations. Forecasting and Trend analysis with 2 smoothing options. Exponential smoothing, moving average. Paper graphs are actual plots not screen dumps.

HARDWARE: Apple II with 64K and 2 disk drives, Apple IIe with an 80 column card. ITT 2020, 64K RAM, (USCD Pascal version 4, version for hard disk systems). Working on an IBM-PC version.

LANGUAGE: (Pascal)

AVAILABILITY: Appli-Tech Software Services, Ltd.
Broad Oak, Accrington
BB5 2DJ (United Kingdom
Tel (0254) 393122

PRICE: In United Kingdom L450, negotiations for sale in U.S. $500? Small annual maintenance charge for updates.

COMMENTS: Copes with 20 variables x 50 observations in multiple regression in 2 minutes. Missing observation facility. Unlimited disk storage capacity.

SOURCE OF INFO: Letter and Flyer 1983

NEW *Pascal driven program for data analysis*

AIDA

Software for graphics, statistics and forecasts.

Are you asked to analyse or present data on your organisation's past or future performance. Do you want to explain the relationship between say, your sales and changes in advertising or competitors' prices? Or perhaps you want to examine variations in critical production figures. If you are interested in this type of work but do not have the time or manpower to collect, store and analyse the numerical data by hand, AIDA can help you.

Combined with an Apple II micro computer the AIDA program will allow the user to subject any series of observations (for example, on prices, production or sales data) to technical analysis and graphical display. New series can be produced from original data using simple arithmetic formulae or from combination with other series (to produce market share ratios, for example, or failure rates). You can chart this year's results against any other year or against as many as three other series simultaneously. When linked to a plotter excellent copies of any graph or histogram you wish can be reproduced within seconds in full colour.

Statistical analysis may be carried out on data to help understand the behaviour of specific series (with the usual statistical tests). Alternatively, the forecasting option allows you to approximate the underlying trend of a series and use it to forecast future values. The program also gives you the facility to make up tabulated reports of the data used in any analysis.

£450 + VAT (includes three discs, comprehensive manual and U.K. delivery charges).

For more information contact: Appli-Tech Software Services Ltd.,
Broad Oak,
Accrington, BB5 2DJ
Tel. (0254) 393122

or Fairhurst Instruments Ltd.,
Dean Court,
Wilmslow, SK9 2LT
Tel. (0625) 525694

AIDA stands for Apple Interactive Data Analysis

Here are more details of the various functions available in the program:

GRAPHICS. Up to four series can be simultaneously graphed on the screen. The user can produce line charts, bar charts or a histogram from data on one series, and a scattergram of two series. Graphs of two or more series can be automatically scaled and, at all times, it is possible to graph part or all of the data available. Transfer of any graph from the screen to paper may be done using a Watanabe plotter (for full colour copies) or by means of an Epson or Anadex printer (black and white copies but not screen dumps).

STATISTICS. AIDA offers comprehensive, but easy to use, statistical options. Cross-sectional (survey) and time series data can be handled by the program. Regression procedures include; ordinary least squares, two-stage least squares, and an iterative autoregressive estimation method. The user may estimate models involving lags, different transformations etc. and update those models easily and quickly. Whatever the size of the model the program always informs the user of expected calculation times.

FORECASTS. Many data series vary over time in such a way as to make it difficult to determine the underlying trend. AIDA provides two smoothing procedures to help identify that trend. namely: a moving average procedure and an exponential smoothing method. The user has full control over their critical parameters and a graphical display is produced to guide him in his analysis. Once a trend has been satisfactorily identified the program will fit a line to it and extrapolate the desired number of values into the future. Hard copies of the results may be reproduced using the plotter/printer.

REPORT WRITER. This facility allows AIDA to present data in tabulated form. Prompted by questions on the screen the user can make up a table from observations on various data sources with his own headings and footnotes. The user can control the width and size of the table and, when finished, transfer it to the printer. If required, the format of the table may be stored for future use.

SOME GENERAL POINTS ABOUT AIDA

THE SOFTWARE. AIDA is very user friendly and all interaction between the user and the program is in plain English. The program also includes a full data handling capacity (to allow data input, transformation and manipulation). The user can input; 5-day week obser-vations (with reference to an inbuilt calendar in AIDA), daily, weekly, quarterly and annual data as part of the 'standard' AIDA program (other periodicities are available at special request). There is also a 'missing' observations facility. Data transfer is possible from disc to disc and thus there is unlimited data storage capacity. All AIDA programs are person-alized with the purchaser's name and unique security password. AIDA is written in UCSD PASCAL.

THE HARDWARE. AIDA needs an Apple II or ITT 2020 computer with 64K and two 5¼" floppy disc drives. A visual display unit is also necessary. Optional: a colour monitor (to allow easy definition of three or more series graphed simultaneously), and a printer and/or plotter (to allow reproduction of screen text or graphics).

SUMMARY STATISTICS for RETAIL PRICES

76 monthly observations from Jan1975 to Apr1981

Created on 1Jan83   Last used on 1Jan83

RETAIL PRICE INDEX

Minimum Value	119.900	reached at Jan1975
Maximum Value	292.200	reached at Apr1981
Mean Value	197.797	
Range	172.300	
Variance	2163.41	
Standard Deviation	46.5125	

Observations

Date					
Jan1975	119.900	121.900	124.300	129.100	134.500
Jul1975	138.500	139.300	140.500	142.500	144.200
Jan1976	147.900	149.800	150.600	153.500	155.200
Jul1976	156.300	158.500	160.600	163.500	165.800
Jan1977	172.400	174.100	175.800	180.300	181.700
Jul1977	183.800	184.700	185.700	186.500	187.400
Jan1978	189.500	190.600	191.800	194.600	195.700
Jul1978	198.100	199.400	200.200	201.100	202.500
Jan1979	207.200	208.900	210.600	214.200	215.900
Jul1979	229.100	230.900	233.200	235.600	237.700
Jan1980	245.300	248.800	252.200	260.800	263.200
Jul1980	267.900	268.500	270.200	271.900	274.100
Jan1981	277.300	279.800	284.000	292.200	

SUMMARY STATISTICS for FT 500

66 monthly observations from Jan1976 to Jun1981

Created on 1Jan83   Last used on 1Jan83

FT INDEX OF 500 SHARES

Minimum Value	134.100	reached at Oct1976
Maximum Value	337.100	reached at Apr1981
Mean Value	235.634	
Range	203.000	
Variance	2481.53	
Standard Deviation	49.8149	

SHARE PRICES AND INFLATION.
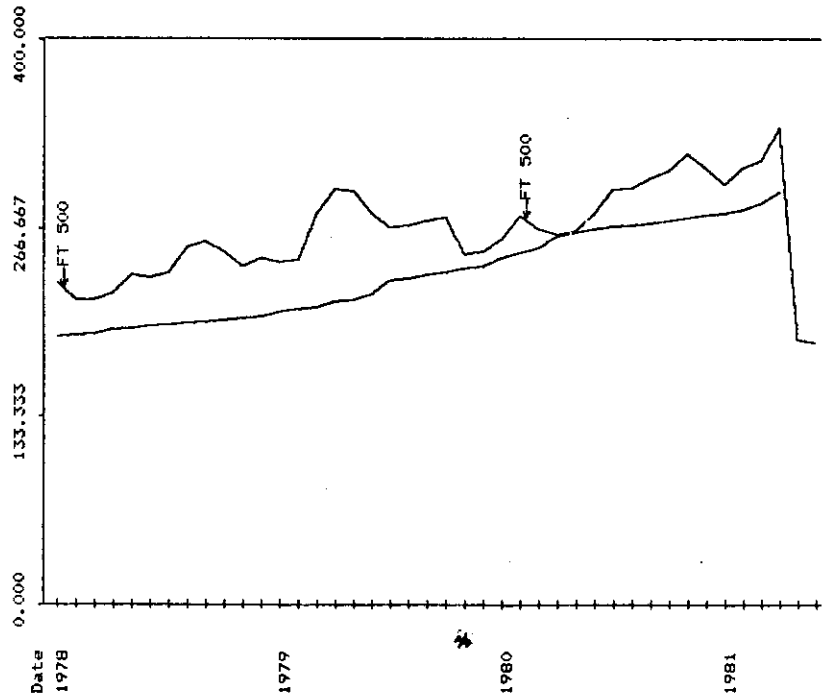
ORDINARY LEAST SQUARES RESULTS

with FT 500 as dependent variable

using 24 monthly observations from Jan1979 to Dec1980

Regressor	Value	Standard Error	T-ratio	Mean
Intercept	122.459	67.4830	1.815	1.0000
FT 115[t]	-0.1314	0.2251	0.584	286.513
RETAIL PRICES[t]	0.0226	0.3664	0.062	243.604
GOLD PRICE[t]	0.1009	0.0866	1.166	287.096
SILVER PRICE[t]	-0.0338	0.0309	1.092	358.779
FT 500[t-1]	1.1954	0.2526	4.732	273.875
FT 500[t-2]	-0.5840	0.2872	2.034	270.554
				276.537 (dep vble)

Residual Variance   142.046

R Square   0.7678
R Bar Square 0.6859   Durbin-Watson 1.9627

Sums of Squares:
     Total 10400.1   Explained 7985.33   Residual 2414.79

               Degrees of Freedom   17

     FIRST ORDER AUTOCORRELATION RESULTS

with FT 500 as dependent variable

using 24 monthly observations from Jan1979 to Dec1980

Correlation parameter (rho): 0.0083 after 3 iterations

Regressor	Value	Standard Error	T-ratio	Mean
Intercept	122.685	56.9630	2.154	1.0000
FT 115[t]	-0.1321	0.1901	0.695	286.513
RETAIL PRICES[t]	0.0239	0.3097	0.077	243.604
GOLD PRICE[t]	0.1009	0.0730	1.382	287.096
SILVER PRICE[t]	-0.0337	0.0261	1.292	358.779
FT 500[t-1]	1.1902	0.2132	5.583	273.875
FT 500[t-2]	-0.5801	0.2422	2.395	270.554
				276.537 (dep vble)

Residual Variance   100.618

R Square   0.9987
R Bar Square 0.9982   Durbin-Watson 1.9671

Sums of Squares:
     Total 1.81647E6   Explained 1.81406E6   Residual 2414.83

PROGRAM NAME: COMPSTAT

DESCRIPTION: Includes over 420 programs. Package is
organized onto disks each covering a single statisti-
cal topic with its own data management program. Data
file structure transparent to user. Programs include:
explana- tory analysis, basic stats.   ANOVA, non-
parametric statistics, data probability platting
graphs, stepwise and non-linear regression, time
series (Box-Jenkins), contingency tables, sampling
intro statistics education counts.

HARDWARE: CP/M on a Z-80 microcomputer with Bazic
(a Z-80 Basic) 8" Disks 48K memory. Also 5 1/2" for-
mat for North Star.

LANGUAGE: Bazic

AVAILABILITY: COMPSTAT
P. O. Box 268
Gloucesten Point, VA   23062

PRICE: $1,000 "Topics sold separately at $200.
Documentation only, $100 (1,000 pages).

COMMENTS:

SOURCE OF INFO: Promotional material

PROGRAM NAME: DB MASTER STAT PAK

DESCRIPTION: DB MASTER STAT PAK is an accessory statistics
package for DB MASTER users.

1. Performs statistical analysis on data contained
   in DB MASTER files.

2. Uses values from any numeric, dollar/cents or
   computed fields.

3. Uses select formats to choose which records to
   include in a test.

4. Tests available include:
   - Mean, standard deviation & Standard Error
   - Coefficient of Variation
   - Frequency Distribution
   - Unpaired t-Test
   - Mann-Whitney U Test
   - Wilcoxon Paired Sample Test
   - Chi-Square Test
   - Linear Regression
   - Correlation
   - One-Way ANOVA with Newman Keuls Test

5. Based on ED-SCI Statistics Package.

HARDWARE: Apple II

LANGUAGE: Basic

AVAILABILITY: Stoneware, Inc.
50 Belvadere St.
San Rafael, CA 94901 (415/454-6500)

PRICE: $99

COMMENTS: DB MASTER is one of the best selling data management
packages for the Apple. Interfacing a stat package
with good data management capabilities should elim-
inate many frustrations associated with programs that
do not provide such capabilities.

SOURCE OF INFO: Advertisement

PROGRAM NAME: Econometrics, Linear Models, and Forecasting (ELF)

DESCRIPTION: Menu driven. Stepwise regression, factor analysis,
                  correlation, coefficients, cross tabs, simple statis-
                  tics, t-tests, 2 way ANOVA, covariance analysis step-
                  wise discriminant analysis, probabilities, scatter-
                  grams, all BASIC transformations and more. Graphs and
                  hictograms. Data base can be on multiple disks with
                  up to 250 variables for each record. Some calcula-
                  tions limited to 25 variables.

HARDWARE: Apple II, 48K, one drive. Atari CP/M, CP/M 2.2

LANGUAGE: Basic

AVAILABILITY: The Winchendon Group
                  Box 10114
                  Alexandria, Virginia 22310
                  (703/960-2587)

PRICE: $200

COMMENTS: Used for small data bases by Valerie Kelly and
                  Bob Stevens. Package was designed specifically for
                  use in economics. More information available in Staff
                  Paper #83-13 (about ELF) and Staff Paper #82-32 which
                  compared ELF with seven statistics programs. Manual
                  easy to read and use. Interfaces with TWG-ARIMA for
                  time series analysis. Some bugs in early versions.

SOURCE OF INFO: Winchendon correspondence and ELF manual.

January 1983

THE WINCHENDON GROUP SYSTEM

Any system is built around a core. All The Winchendon Group programs can use databases created by our other programs. All of our packages include these database utilities:

Create, correct, add new observations. A series of programs use a screen mask to lead you through this. New variables may be added to an existing database. New data may be appended, also. Variable names may be changed.

Transformations. Use BASIC commands and refer to variables by name. Add, subtract, take logarithms, lag variables, reject unwanted observations, etc.

Print a database. Or list it on your screen. Select some or all variables. Select rounding, if desired.

Print ELF database catalog. Without leaving ELF.

Numeric keypad. Optionally transform left or right side of keyboard to a numeric keypad.

ELF—ECONOMETRIC and LINEAR FORECASTING PROGRAM

ANOVA one- and two-way. For more complex designs, use TWG/GLM (General Linear Model) which does Analysis of Variance, Analysis of Covariance, MANOVA, Regression. (Available third quarter 1982).

Correlations

Crosstab up to three dimensions. Prints actual number in each cell, cell percentage, row percentage or column percentage. Chi-Square, Cramer's V, Phi and Contingency Coefficients.

Discriminant analysis user directed stepwise method. Can print classification and probabilities for each observation, flagging new and erroneously classified observations. Summary table.

Factor analysis principal components or principal factors. User given relevant information before making decisions, e.g. eigenvalues before deciding how many factors to retain. Unrotated factor matrix, communalities, rotated factor matrix, transformation matrix. Varimax, equimax, quartimax or no rotation. SMC or maximum off-diagonal row coefficient as initial estimate of communalities. Scores and saves database.

Frequencies and Histograms

Scattergram and simple regression uses Apple high resolution graphics.

Significance of t, F, Chi-Square and normal statistics using National Bureau of Standards approximations and more recently developed formulas.

Simple statistics mean, standard deviation, variance, standard error, minimum, maximum range, skewness, kurtosis, sum and number of observations.

Stepwise regression user directed multiple stepwise regression. Intercept (constant) optional. Can calculate and graph actuals and predicteds. R-squared. Adjusted R-Squared. regression coefficients, t-statistics, Durbin-Watson, von Neumann ration, sum of squared

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residuals and more.

T-test on means paired or unpaired. Common or separate variance.

TWG/ARIMA

Follows the approach developed by Box and Jenkins and similar to their programs 1-4 with enhancements, more user control and recent improvements in algorithms. TWG/ARIMA was tested against all the Box-Jenkins examples and mainframe packages. TWG/ARIMA includes:

- Identification
- Estimating
- Forecasting
- Seasonal and non-seasonal models
- Box-Cox transformations
- Centering data
- Differencing

TWG/ARIMA allows the user to

- Save intermediate calculations
- Define convergence criteria
- Q statistic, t-statistics, coefficients, mu, see grid

TWG/ARIMA offers printer graphics.

GENERAL SPECIFICATIONS

All programs run on a 48K Apple II with Applesoft. Special Apple III versions are available upon request. One disk drive and DOS 3.3 are required. A second disk drive and

FORECASTING
AND
STATISTICS

- TWG/ARIMA univariate ARIMA package

- TWG/GLM general linear models program (for release third quarter 1982).

OUR FIRSTS

The Winchendon Group sets the standards for microcomputer statistical and forecasting software. Among the firsts we claim are:

- First discriminant analysis, first stepwise discriminant analysis

- First factor analysis and principal components

- First ARIMA program

- First stepwise regression program in a general package

SATISFIED CUSTOMERS

Our customers include: Oneida Ltd, University of Chicago, Michigan State University, New York Zoological Society, Law School Admissions Services, Michael Reese Hospital, Arthur Young, Wharton School of Business, Research Triangle Institute, Florida State University, Vanderbilt Medical Center, ITT Kaiser-Georgetown Health Plan, Oregon Health Sciences University, Penn State University, Boston State, Federal Inst. for Geoscience (West Germany), San Jose State University, The University of California (many branches), The Johns Hopkins University, the State of Delaware, and many more.

a printer are helpful.

All programs have been tested against published examples and/or mainframe statistical packages such as SPSS and SAS.

Number of observations. In general unlimited because databases can span disk sizes. EASI/ARIMA is limited to 800 observations, TWG/ARIMA to 400. For these last two programs, a language card and a DOS move program will increase capacity. Because of the limited number of observations for these two programs, each database used with these programs must be on a single diskette.

Number of variables. Databases are limited to 250 variables. Individual procedures are limited to 25 variables, unless the technique is more restrictive.

GUARANTEES, UPDATES and MAINTENANCE

Because we have no control over how the programs are used, we can make no guarantees as to the results of their use or the appropriateness of a technique in a given situation. Consulting help on statistical and economic problems is available at additional cost. All programs are sold with one year of maintenance and updating to purchasers who register their products with us. Additional years are available.

OUR SOFTWARE

Our software includes:

- ELF (Econometric and Linear Forecasting) general purpose statistical package

PROGRAM NAME: Ed-Sci Statistics

DESCRIPTION: A STATISTICS AND DATA MANAGEMENT PACKAGE-
                       Menu Driven

Data Entry and Filing	Statistical Calculations
- By Variable Name and Case Number	- Mean, Std. Dev., Std. Error
- One-Time Data Entry	- Coefficient of Variation
- Easy and Rapid Editing	- Frequency Distribution
- Data Entry Worksheets	- Unpaired t-Test
	- Paired t-Test
	- Mann-Whitney U Test
Data File Manipulation	- Wilcoxon Paired Sample Test
	- Chi-Square Test
- Add New Variables	- Correlation
- Create SUBFILES by User	- One-Way ANOVA with the Newman-Keuls Test
- Defined SEARCH & SELECT Criteria	- Hard Copy of Data & Results
- Merge Files	- Linear Regression

HARDWARE: Apple II, 48K, one drive

LANGUAGE: Basic

AVAILABILITY: Ed-Sci Development
                  1412 Riveroaks Drive
                  Modesto, CA 95356 (209-545-3656)

PRICE: $95

COMMENTS: This program has also been marketed as "Apple-Statistics." Interfaces with Visicalc DIF, Datadex files and Apple Plot. Data management looks good in ad. for the price. No multiple regression mentioned. This is program being used by DB MASTER for their StatPak. Missing data handled.

SOURCE OF INFO: Ad in Micro, January '82 (Ed-Sci Statistics) in Oct. '81 Creative Computing (Apple-Statistics) and promotional material.

ED-SCI STATISTICS

A professional statistical calculation package for the Apple II. It includes data entry and data file manipulation, statistical testing, use of VisiCalc and Datadex Files, and file creation for Apple Plot.

STATISTICAL CALCULATIONS & TESTS

> Mean, Standard Deviation & Standard Error of the Mean
> Coefficient of Variation
> Frequency Distribution
> Unpaired t-Test between 2 variables or between 1 and a constant
> Paired t-Test
> Chi-Square Analysis
> Linear Regression with ANOVA and t-Tests of Significance
> Correlation
> One Way Analysis of Variance with the Newman-Keuls Test
> Mann-Whitney U Test
> Wilcoxon Paired-Sample Test

DATA ENTRY AND FILING

Data files are created by assigning variable names and defining the variables as Alphanumeric or Numeric. Data values are entered for each Case by Variable. There are full editing capabilities so variable names and types can be changed at any time; data values can be changed or deleted; and new variables and/or new cases can be added to an existing data file. A pad of specially designed Data Entry Forms is included to assist the user with data entry.

The programs are self-explanatory and prompt the user with questions at each step. The user orientation of the programs provides extensive Error-Trapping.

Missing data values are deleted either singly or in a pair-wise fashion depending upon the specific statistical test or calculation.

The format of the statistics data files is described clearly in the manual so the user can write individualized programs that will store data on the Data Disk to be read directly by the ED-SCI STATISTICS programs. Also, back-up copies of data disks can be made easily.

DATA FILE SIZE

There are three factors that govern the maximum size of a data file: (1) Number of Variables, (2) Number of Cases, and (3) Average length of the data values (in number of characters). An extensive table is provided in the instruction manual to assist the user in determining the optimum size of individual data files. As an example, a data file with 2 variables and an average data value length of 2 characters can have 1,465 cases per variable for a total of 2,930 individual data points. A file with 5 variables and an average data value length of 4 characters can have 500 cases per variable for a total of 2,500 individual data points. A file with 10 variables and average data value length of 3 characters can have 300 cases per variable for a total of 3,000 individual data values.

CREATE OR MERGE SUBFILES

Subfiles can be created from master data files in one of two ways: Subfiles can contain as many of the variables from the master file as the user wants and (1) all of the case values for those variables; or (2) only those cases that meet specific criteria set by the user.

ED-SCI STATISTICS has a Search and Select function where up to three different criteria for inclusion into the subfile can be set (one for each of three variables). Criteria include: <, =, >, <>, >=, and <=. Criteria can be set for both Alphanumeric and Numeric data. The user can choose to include, for example, 6 of 10 variables in the subfile and set conditions for up to 3 of those variables. As an example, the conditions might be: Include only those cases where SEX = FEMALE and AGE > 20 and TEST SCORE >= 75. Only those cases that meet all three criteria will be included in the new subfile.

Subfiles and master data files can also be merged. The Search and Select feature and the ability to merge files provides the user with tremendous flexibility in manipulating data files. It is an excellent way to work with very large data files that can be broken down into smaller units saving time and computer memory.

USE WITH APPLE PLOT

ED-SCI STATISTICS will create text files that can be read directly by Apple Plot. This allows the user to display the data graphically. Apple Plot files can be created from individual variables or from two variables as X-Y pairs. The Linear Regression program will also create Apple Plot files to plot a scattergram and the regression line.

USE WITH VISICALC AND DATADEX

The 16 sector version of VisiCalc can create DIF files. A utility program is included with ED-SCI STATISTICS that will convert the VisiCalc DIF file into an ED-SCI STATISTICS file. With this file, all statistical calculations and tests can be performed on the VisiCalc data. There is a similar utility program that will convert DATADEX files into ED-SCI STATISTICS files.

COMPUTER REQUIREMENTS

An Apple II with an Applesoft or Language card, or an Apple II Plus, and at least one disk drive with DOS 3.3 (16 sector). A printer is not required but is useful for hard-copies of data or results.

ED-SCI STATISTICS PACKAGE

ED-SCI STATISTICS comes with a 75 page Instruction Manual, a Master Program Disk, a Back-Up Disk, and a pad of Data Entry Forms for $95.00. Available at your Apple Computer Store.

For information, please phone or write:

Ed-Sci Development

PROGRAM NAME: HSD Stats
                     HSD Anova
                     HSD Regress

DESCRIPTION: (See also Stats Plus)

HSD STATS	HSD ANOVA
Analysis of Samples of 200	Analysis of Variance
Descriptive Statistics	1 to 8 Independent Factors
10 Data Transformations	Balanced Designs
Frequency Distribution, Bargraph	Between and/or Within Subjects Designs
Chi Square, Scattergram	Up to 1400 Data Points with 48K Memory
Correlation Matrix	Anova Table Output
Linear Regression	Treatment Means and Standard Deviations
3 T Tests	Keyboard or Disk Data Input
Keyboard or Disk Data Input	Video or Hard Copy Output
Video or Hard Copy Output	Data File Creation
Data File Creation	
Menu Driven	

HSD REGRESS

Complete Multiple Regression Analysis
Up to 25 Variables
Up to 300 Cases/Variable
Transformations
Descriptive Statistics
Correlation Matrices
Regression on Any Subset of Variables
Regression on Any Order of Variables
Hi-Res Scatterplot and Residual Pot
Keyboard or Disk Data Input
Data File Creation
Predicted and Residual Scores File Creation
Menu Driven

HARDWARE: Apple II, 48K, 3.2 or 3.3 DOS, one disk drive, IBM-PC

LANGUAGE: Basic

AVAILABILITY: Human Systems Dynamics (HSD)
                  9249 Reseda Boulevard
                  Suite 107
                  Northridge, California 91324
                  (213/993-8536)

PRICE: Stats = $99.95, Anova = $74.95, Regress = $99.95.
                  Documentation for each package available separately at
                  $7.50 per package. (IBM-PC: Regress, $200; Stats $200)

COMMENTS: See reviews in Softalk of STATS (a poor rating
                  received) and ANOVA (a good rating received) and two
                  Peelings reviews.

SOURCE OF INFO: October '81, dealer literature, and Peelings II
                  reviews February and March 1982.

$99.95   **H S D   R E G R E S S**

A MULTIPLE REGRESSION PROGRAM PACKAGE
FOR THE APPLE II

HSD REGRESS performs regression analysis for sets of data containing up to 25 variables, and up to 300 cases per variable. The analysis is performed on all variables input, or on any subset of variables, in any order.

HSD REGRESS is menu-driven. You choose which of the 5 programs will be run.
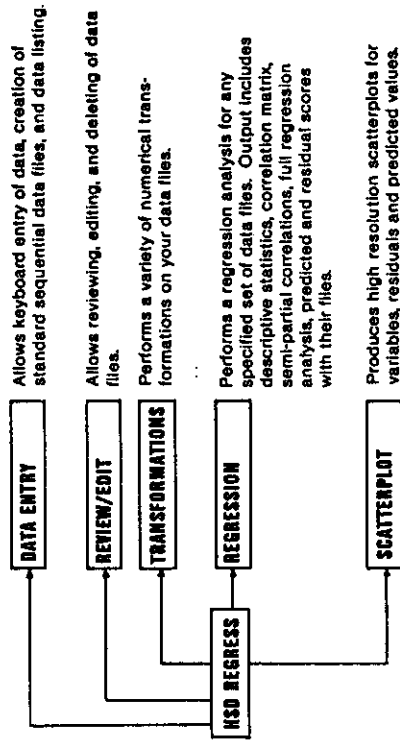
DATA ENTRY — Allows keyboard entry of data, creation of standard sequential data files, and data listing.

REVIEW/EDIT — Allows reviewing, editing, and deleting of data files.

TRANSFORMATIONS — Performs a variety of numerical transformations on your data files.

REGRESSION — Performs a regression analysis for any specified set of data files. Output includes descriptive statistics, correlation matrix, semi-partial correlations, full regression analysis, predicted and residual scores with their files.

SCATTERPLOT — Produces high resolution scatterplots for variables, residuals and predicted values.

HSD REGRESS

HSD REGRESS performs a least-squares regression analysis. The program operates on a set of predictor (independent) variables and a single criterion (dependent) variable.

After DATA ENTRY creates sequential data files on disk for your variables. REGRESSION reads those data files into memory. REGRESSION then performs a regression analysis using all of your variables or any subset of your variables in any order.

$99.95   **H S D   S T A T S**

A GENERAL STATISTICAL ANALYSIS PACKAGE
FOR THE APPLE II

With HSD STATS, you can enter up to 7 samples of 200 cases each from keyboard or disk. After entering the samples, you can choose an analysis option from the program menu. The chosen analysis will then be applied to the particular samples specified by you.

Features include: any or all analyses in one run; optional hard copy of all results; error detection and bomb-proof input; built-in DOS commands; high resolution graphics option; organized and formatted output; complete documentation and instructions.

ANALYSIS/PROCEDURE OPTIONS

DATA ENTRY — keyboard or disk — **DATA REVIEW/EDIT** — review and edit

t-TESTS
-single mean
-independent or correlated samples
-t, df, p
-F-test on variance

FILE CREATION
-files from samples
-combined samples
-append samples to files

TRANSFORMATIONS
-constant: +, -, X, ÷
-z-scores
-new mean, s.d.
-square root
-reciprocal, log

PRINT DATA
-formatted hard copy of sample data

CORRELATION MATRIX
-up to 7 variables
-formatted output

CORRELATION & REGRESSION
-r, p, df
-slope, intercept
-hi-res scattergram

CHI-SQUARE
-one, two variable
-expected frequency
-d, f, p, phi
-formatted hard copy

FREQUENCY DISTRIBUTION
-grouping option
-percentile ranks
-percentile points
-hi-res bargraph

DESCRIPTIVE STATISTICS
-sample size
-mean
-standard deviation

HSD STATS

SAMPLE PRINTOUT

DISTRIBUTION OF A   N = 250

57 VALUES IN THE SAMPLE

MAXIMUM: 82
MINIMUM: 15
RANGE: 67

INTERVAL	FREQUENCY	CUM. FREQ.
15 - 20	3	3
21 - 26	8	11
27 - 32	14	25
33 - 38	23	48
39 - 44	33	81
45 - 50	54	135
51 - 56	32	167
57 - 62	31	198
63 - 68	28	226
69 - 74	15	241
75 - 80	7	248
81 - 86	2	250

SAMPLE	N	MEAN	S.D
A	250	50.200	13.561
DX	250	.000	.770

T = 58.538 DF = 249 P = .000

STANDARD ERROR = .857

OMEGA SQUARED = .931

F(VAR) = 309.479 DF = 249,249 P = .000

INCOME

AGE	<3K	3K-6K	6K-9K	9K-	
-26	46	30	10	20	100
	27.77	30.55	13.88	27.77	
24-46	50	60	70	20	200
	33.33	41.11	27.77	53.33	
46-	10	20	20	10	60
	16.66	10.33	8.33	16.66	
	100	110	50	100	340

CHI-SQUARE = 36.781 DF = 6 P = .000

CRAMER PHI = .226

HSD REGRESS

SAMPLE PRINTOUT

JOB NAME: KERLINGER PG 243

7 PREDICTORS   24 CASES

VARIABLE	FILE NAME
OX1	OX1
OX2	OX2
OX3	OX3
OX4	OX4
OX5	OX5
OX6	OX6
OX7	OX7
DY	DY

ANALYSIS OF VARIANCE

SOURCE	SS	DF	MS
REGRESSION	145.409	7	20.772
RESIDUAL	27.215	16	1.700
TOTAL	172.625	23	

R-SQUARED = .8423 ST.ERROR = 1.304

F(7,16) = 12.212 P = .000

REGRESSION COEFFICIENTS

INTERCEPT   7.9109

VARIABLE	WEIGHT	F	PROB.
OX1	-2.0005	54.636	.000
OX2	-1.7671	13.152	.002
OX3	-.4109	.784	---
OX4	.4223	.828	---
OX5	-.0843	.469	---
OX6	-.4156	.905	---
OX7	.0843	.037	---

$74.95   H S D   A N O V A

A GENERAL ANALYSIS OF VARIANCE PROGRAM
FOR THE APPLE II

HSD ANOVA provides a flexible, general and easy to use analysis of variance procedure, with these features:

Analysis of any balanced design, from a simple two-group design to complex factorial designs with up to 8 variables.

Analysis of designs with between-subjects and/or within-subjects factors, with simple design specifications and data entry.

Production of a fully formatted ANOVA summary table showing: experiment name; experimental effects names; sums of squares; degrees of freedom; mean squares; F-ratios; F probabilities; means and standard deviations.

SOURCE	SS	DF	MS	F	P
AAA	126.150	1	126.150	17.321	.003
ERROR	58.267	8	7.283		
BIT	176.817	1	176.817	38.581	.000
AAA BIT	138.016	1	138.016	30.016	.001
ERROR	36.667	8	4.583		
CCO	4.933	2	2.467	.510	
AAA CCO	8.400	2	4.200	.869	
ERROR	77.333	16	4.833		
BIT CCO	46.533	2	23.267	6.317	.010
AAA BIT CCO	8.534	2	4.267	1.159	.340
ERROR	58.933	16	3.683		

Program options include:

O user specification of variable names and condition names.
O output to TV monitor or 40- or 80-column printer.
O data entry from keyboard or from disk.
O data output to disk.
O data review and editing at input.

Hierarchical Designs. The program can be used to analyze at least some kinds of hierarchical designs. This is accomplished by entering the design as if all variables were crossed. When the ANOVA table has been obtained, the sums of squares can be recombined to obtain the appropriate error terms.

Random Effects. The program computes F-ratios for fixed effects only. However, the F-ratios for random effects can be computed from the SS and df terms produced by the program.

11

H S D   A N O V A

SAMPLE PRINTOUT

WINER PG 546

PROBLEM DESCRIPTION

FACTOR	NAME	LEVELS	TYPE
1	A	2	B
2	B	3	W
3	C	3	W

N PER CONDITION: 3

INPUT FILE NAME: W546

SOURCE	SS	DF	MS	F	P
TOTAL	9924.833	53			
BETWEEN S	2959.278	5			
A	468.167	1	468.167	.752	
<ERROR>	2491.111	4	622.778		
WITHIN S	6965.555	48			
B	3722.333	2	1861.167	63.389	.000
A B	333.000	2	166.500	5.671	.029
<ERROR>	234.889	8	29.361		
C	2370.333	2	1185.167	89.826	.000
A C	50.333	2	25.167	1.907	.210
<ERROR>	105.553	8	13.194		
B C	10.667	4	2.667	.336	
A B C	11.334	4	2.834	.357	
<ERROR>	127.113	16	7.945		

PROGRAM NAME: INTER-STAT (Interactive Statistics)

DESCRIPTION: INTER-STAT offers a full range of interactive
statistical analysis techniques, from averages and
medians to binomial and poisson distributions, corre-
lation coefficients and one- and two-way analysis of
variance. CHI-Square contingency tables. Menu
driven. Histograms and plots.

HARDWARE: Apple II, 48K, one disk drive

LANGUAGE: Basic

AVAILABILITY: Serendipity Systems, Inc.
225 Elimira Road
Ithaca, New York 14850
(607/277-4889)

PRICE: Inter-stat = $99.95, Manual only $15

COMMENTS: Patterned after MINI-TAB mainframe package. Need
more information about how it "stores and retrieves
data from disk in a simple format that other programs
can use and generate."

SOURCE OF INFO: Serendipity promotional material, 1983

PROGRAM NAME: Intro Stat

DESCRIPTION: Menu Driven complete data file management program
including transformations. Similar to SPSS displays,
variable labels on screen with statistical results,
printer output.

Descriptive Statistics for One Variable: minimum,
maximum, mean, standard, deviation standard error of
mean; optional median and frequency table.

Contingency Table (Crosstabulation of two variables
with chi-square test.
Student's t-test (two-group): simple or matched-
pairs; optional one-group test.
Mann-Whitney U Test
Wilcoxon Matched-Pairs Signed-Ranks Test
One-way Analysis of Variance.
Two-way Analysis of Variance.
Two-variable scatterplot in Hi-Res graphics
(optional regression line).
Pearson Correlation Matrix
Simple Linear Regression

HARDWARE: Apple 48K

LANGUAGE:

AVAILABILITY: Microstat Software
P.O. Box 172
Concord, MA 01742

PRICE: $75

COMMENTS: Data file of 3,000 data elements in memory
(60 cases by 50 variables, up to 5,000 data elements
possible, handles missing data)

SOURCE OF INFO: The Blue Book

PROGRAM NAME: Maxi Stat (The TRS-80 version of StatPac, Walonick Associates)

DESCRIPTION: Menu driven, user created codebook, up to 255 variables. Frequency distributions, descriptive statistics, crosstabs and Chi-Square correlation and linear regression, T-test, multiple linear regression, ANOVA, multiple variable response. Graphs of analyses.

HARDWARE: TRS-80 Models I, III, and IV with 2 disk drives.

LANGUAGE: Machine

AVAILABILITY: Adventure International
Longwood, FL 32750
(305) 830-8194 (questions) (800) 327-7172 (orders)

PRICE: $199.95

COMMENTS: Written by D. Walonick

SOURCE OF INFO: Ad. in Access March/April, 1983.

PROGRAM NAME: Microstat – 2.0 (New Rel. 3.0)

DESCRIPTION: Features of Microstat Rel. 2.0 include: menu
driven, the ability to declare each data file's numer-
ical precision and drive location plus a Data Manage-
ment Subsystem for file maintenance (edit, list, des-
troy, augment, sort, rank-order, move and merge) plus
transformations (add, subtract, multiply, divide,
reciprocal, log, natural log, and antilog, exponentia-
tion and linear) that allow you to create new vari-
ables for existing variables.

Other features include: descriptive statistics (mean,
sample standard deviation and variance, standard
error, minimum, maximum, sum, sum of squares, moments
about the mean, skewness and kurtosis, and deviation
sume of squares), Hypothesis tests (mean or propor-
tion), Analysis of Variance (one-way, two-way and ran-
dom blocks), Scatterplot (with overlapping points
indicated), Correlation analysis, Simple, Multiple,
and Stepwise Multiple Regression analysis (with sup-
port statistics), Time Series analysis, Nonparametric
Tests, Crosstabls (including Chi-Square), Factorials,
Permutations, Combinations, and Probability Distribu-
tions.

HARDWARE: CP/M, IBM-PC, Apple with CP/M,
Basic-80 and an 80 column card, recommend minimum of
250K disc storage (1 or 2 drives). Formats: either 8"
or 5 1/4" disks. SBTRS2, CDOS, APPL, XX.

LANGUAGE: North Star Basic, Microsoft's Basic-80 (release 5 or
later), Systems CBasic2.

PRICE: $295 Manual with sample printouts, $25.

AVAILABILITY: Ecosoft, Inc.
Box 68602
Indianapolis, IN 46268-0602
(317/283-8883)

COMMENTS: Data management subsystem appears to be more extensive
than that for other stat packs. (Leighton Price has
manual and disk.) Small Business project in Egypt has
used program on TRS 80 Model II. Regression program
tested against infamous Longlay data. Out-performs
some main- frame programs. Documentation of formulas
used. Info World review gave excellent ratings for
functionality, ease of use, documentation, and good
for error handling. Review in 80 Micro, June, 1982,
pp. 280-81. Comparisons with seven other statistics
programs in Staff Paper #82-32.

SOURCE OF INFO: Byte, Sept. '82 manual and flyer sent to
Jim Pease, January 1983. Review by Bill Burns in Info
World, March 16, 1981.

MICROSTAT®
Available for Basic-80 or baZic

Whether you are involved in "pure" research, quality control or any other application using statistics, Microstat can save you time and money. (We've had several people tell us that the saved computer-time charges by using Microstat would pay for Microstat and the computer in less than two years.) You will also find Microstat offers features not found in any other package.

Microstat is not the run-of-the-mill package; the algorithms were selected specifically to reduce errors introduced by the use of large numbers that are frequently used in statistical calculations. To prove it, compare the sample regression output in this flyer to the infamous Longley data (Journal of the American Statistical Association, vol. 62, pp. 819-841) and you will find that Microstat outperforms some of the mainframe regression programs tested. Similar techniques are used in other programs for maximum accuracy. (The results were produced using 10-digit precision baZic.)

While it is not practical to list all of the features of MICROSTAT in this flyer, some of the highlights include:

- A Data Management Subsystem (DMS) for file creation plus the ability to: edit, list, destroy, delete cases, augment, sort, rank order, lag, move, merge and transform the data.

- The data transformations include: add, subtract, multiply, divide, reciprocal, log, natural log, natural antilog, exponential, linear transformation, plus adding any number of variables to create a new variable.

- The DMS places you in complete control of the data files and allows you to create new variables from existing variables via the transformations.

- Other features include: Descriptive statistics (mean, sample standard deviation and variance, population standard deviation and variance, standard error, minimum, maximum, sum, sum of squares, moments about the mean, skewness and kurtosis, and deviation sum of squares), Hypothesis tests (mean or proportion), Analysis of Variance (one-way, two-way and random blocks), Scatterplot (with overlapping points indicated), Correlation analysis, Simple, Multiple, and Stepwise Multiple Regression analysis (with support statistics), Time Series analysis, Nonparametric Tests (Wald-Wolfowitz,

InfoWorld
Software Report Card

MICROSTAT
ECOSOFT

	Unacceptable	Poor	Fair	Good	Excellent
Functionality					
Documentation					
Ease of Use					
Error Handling					
Support					

Infoworld, March 16, 1981.

Wilcoxon Rank-Sum for two groups, Kruskal-Wallis One-Way ANOVA by ranks, Kolmogorov-Smirnov Goodness of Fit and Two group Tests, Absolute Normal Scores test, Friedman, Kendall, and Sign test), Crosstabs (including Chi-Square), Factorials, Permutations, Combinations, and Probability Distributions (Binomial, Hypergeometric, Poisson, Exponential, Normal, F, Student's t, and Chi-Square).

The user's manual is available separately for $25.00 and includes sample printouts from most programs; the complete package costs $325.00 and is perfect for serious research, educational and industrial work. For a limited time, we are offering Microstat and baZic for $395.00, a savings of $50.00 off the normal price. (Microstat is designed for use with all of baZic's precisions; the sample output in the manual used 10-digit precision.)

------------------------ CORRELATION MATRIX -----------------------
HEADER DATA FOR: A:LONGLEY   LABEL: JASA, V.62, P.819-841
NUMBER OF CASES: 16   NUMBER OF VARIABLES: 7

CORRELATION TEST OF LONGLEY DATA

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--Y--	--Y--	6.844598E+10	1.850088E+08	1.233392E+07	1.0000
--X1-	--Y--	1.068160E+08	5.517000E+05	3.678000E+04	.7405
--X2-	--Y--	4.103227E+11	5.149953E+09	3.433302E+08	.9836
--X3-	--Y--	3.361978E+09	2.473654E+07	1.649103E+06	.5025
--X4-	--Y--	2.740941E+09	1.676510E+07	1.117673E+06	.4573
--X5-	--Y--	1.230685E+11	3.519295E+08	2.346197E+07	.9604
--X6-	--Y--	2.042837E+09	2.436000E+05	1.624000E+04	.9573

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X1-	--X1-	1.680000E+05	3.000000E+03	2.000000E+02	1.0000
--X2-	--X1-	6.467003E+08	1.595300E+07	1.063533E+06	.7566
--X3-	--X1-	5.209090E+06	9.387860E+04	6.258573E+03	.4736
--X4-	--X1-	4.293300E+06	5.270000E+04	3.513333E+03	.3570
--X5-	--X1-	1.921395E+08	1.102700E+06	7.351333E+04	.7473
--X6-	--X1-	3.180800E+06	9.000000E+02	6.000000E+01	.8783

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X2-	--X2-	2.553152E+12	1.481903E+11	9.879354E+09	1.0000
--X3-	--X2-	2.065054E+10	8.418655E+08	5.612437E+07	.6043
--X4-	--X2-	1.663295E+10	4.632063E+08	3.088042E+07	.4464
--X5-	--X2-	7.386802E+11	1.027861E+10	6.852409E+08	.9911
--X6-	--X2-	1.213117E+10	7.064600E+06	4.709733E+05	.9809

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X3-	--X3-	1.762543E+08	1.309835E+07	8.732234E+05	1.0000
--X4-	--X3-	1.314528E+08	-1.730681E+06	-1.153788E+05	-.1774
--X5-	--X3-	6.066486E+09	6.694112E+07	4.462742E+06	.6866
--X6-	--X3-	9.905868E+07	4.459550E+04	2.973033E+03	.6586

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X4-	--X4-	1.159815E+08	7.264500E+06	4.843000E+05	1.0000
--X5-	--X4-	4.923864E+09	2.646140E+07	1.764093E+06	.3644
--X6-	--X4-	8.153700E+07	2.070000E+04	1.380000E+03	.4105

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X5-	--X5-	2.213401E+11	7.258102E+08	4.838735E+07	1.0000
--X6-	--X5-	3.672577E+09	4.938000E+05	3.292000E+04	.9797

ROW	COL.	RAW SSCP	ADJUSTED SSCP	VAR-COVAR.	CORR
--X6-	--X6-	6.112147E+07	3.500000E+02	2.333333E+01	1.0000

------------------------ CORRELATION MATRIX -----------------------
HEADER DATA FOR: A:LONGLEY   LABEL: JASA, V.62, P.819-841
NUMBER OF CASES: 16   NUMBER OF VARIABLES: 7

CORRELATION TEST OF LONGLEY DATA

	--Y--	--X1-	--X2-	--X3-	--X4-	--X5-	--X6-
--Y--	1.000						
--X1-	.741	1.000					
--X2-	.984	.757	1.000				
--X3-	.502	.474	.604	1.000			
--X4-	.457	.357	.446	-.177	1.000		
--X5-	.960	.747	.991	.687	.364	1.000	
--X6-	.957	.878	.981	.659	.411	.980	1.000

------------------------ REGRESSION ANALYSIS -----------------------
HEADER DATA FOR: A:LONGLEY   LABEL: JASA, V.62, P.819-841
NUMBER OF CASES: 16   NUMBER OF VARIABLES: 7

TEST OF THE LONGLEY REGRESSION DATA

INDEX	NAME	MEAN	STD.DEV.
1	--X1-	101.681	10.792
2	--X2-	387.698.438	99,394.938
3	--X3-	3.193.313	934.464
4	--X4-	2.606.688	695.920
5	--X5-	117.424.088	6.956.102
6	--X6-	1.954.500	4.761
DEP. VAR.:	--Y--	65.317.000	3.511.968

DEPENDENT VARIABLE: --Y--

VAR.	REGRESSION COEFFICIENT	STD. ERROR	T(DF= 9)	PROB.	PARTIAL r^2
--X1-	15.0619	84.9149	.177	.8631	.0035
--X2-	-.0358	.0335	-1.070	.3127	.1128
--X3-	-2.0202	.4884	-4.136	.0025	.6553
--X4-	-1.0332	.2143	-4.822	.0009	.7209
--X5-	-.0511	.2261	-.226	.8262	.0056
--X6-	1829.1513	455.4785	4.016	.0030	.6418
CONSTANT	-3482258.3790				

STD. ERROR OF EST. = 304.854
R SQUARED = .995
MULTIPLE R = .998

ANALYSIS OF VARIANCE TABLE

SOURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
REGRESSION	184172401.900	6	30695400.320	330.285	.0000
RESIDUAL	836424.138	9	92936.015		
TOTAL	185008826.000	15			

STANDARDIZED RESIDUALS

	OBSERVED	CALCULATED	RESIDUAL	-2.0 ... 0 ... 2.0
1	60323.000	60055.660	267.340	
2	61122.000	61216.014	-94.014	
3	60171.000	60124.713	46.287	
4	61187.000	61597.115	-410.115	
5	63221.000	62911.285	309.715	
6	63639.000	63888.311	-249.311	
7	64989.000	65153.049	-164.049	
8	63761.000	63774.180	-13.180	
9	66019.000	66004.695	14.305	
10	67857.000	67401.606	455.394	
11	68169.000	68186.269	-17.269	
12	66513.000	66552.055	-39.055	
13	68655.000	68810.550	-155.550	
14	69564.000	69649.671	-85.671	
15	69331.000	68989.069	341.931	
16	70551.000	70757.758	-206.758	

DURBIN-WATSON TEST = 2.4034

PROGRAM NAME: Number Cruncher, Ver. 2.1 (9/1982)

DESCRIPTION: Menu driven. 17 programs. Data input, storage
                 and transformations. ANOVA, one-way and two-way,
                 pair-wise correlations for several variables, cross
                 tabulations and contingency analysis, descriptive
                 statistics, multiple regression several nonparameteric
                 procedures, principle component analysis, statistical
                 function probability calculator for normal, student's
                 T, F, + Binomial, 3+4 way ANOVA.   T-tests, stepwise
                 regression. Scatter plots and histograms. Missing
                 values handled.

HARDWARE: TRS-80 I & II, CP/M, VIC-20 and IBM-PC, one disk
                 drive

LANGUAGE: Microsoft Basic

AVAILABILITY: Dr. Jerry L. Hintze
                 865 East 400 North
                 Kaysville, Utah   48037
                 801/546-0445

PRICE: CP/M $200

COMMENTS: Up to 32 columns of data is on file, files may
                 be merged. Observations limited by disk drive capa-
                 city.

SOURCE OF INFO: Based on Sept. 1982 manual.

(ANOVA Table)

DEPENDENT VARIABLE: 31

SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARE	F-RATIO	TAIL PROB.
COV(30)	1	44.0026	44.0026	15.44	0.0077
A(28)	2	22.6428	11.3214	3.97	0.0796
B(29)	1	1.94819	1.94819	0.68	0.4399
AB	2	4.61805	2.30902	0.81	0.4880
MODEL	6	73.2117	12.2019	4.28	0.0500
ERROR	6	17.096	2.84934		
ADJ. TOT.	12	90.3077	7.52564		

MULTIPLE REGRESSION REPORT FOR VARIABLE 22

COLUMN	ESTIMATE	LAST SS	F RATIO	R-SQUARED	SIMPLE R2
MEAN	-2.85323				
COL(21)	.365377	5.21555	3.79776	5.01991	5.01991
COL(23)	.964533	14.8901	10.8424	75.0769	65.5709
COL(25)	.23042	2.07996	1.51309	79.5066	36.8934

MULTIPLE REGRESSION REPORT FOR VARIABLE 22

ANOVA TABLE FOR REGRESSION

SOURCE	DF	S.S.	MEAN SQ.	F-RATIO
MEAN	1	285.091	285.091	
COL(21)	1	2.35479	2.35479	1.71467
COL(23)	1	32.8631	32.8631	23.9296
COL(25)	1	2.07796	2.07796	1.51309
MODEL	3	37.2958	12.4319	9.05246
ERROR	7	9.61326	1.37332	
ADJ. TOT	10	46.9091	4.69091	

MULTIPLE REGRESSION REPORT
DEPENDENT VARIABLE : COL(22)

ANALYSIS OF VARIANCE TABLE

SOURCE	DF	SUM-SQR	SEQUENTIAL R2	SEQUENTIAL F-RATIO	LAST SUM-SQR	LAST F-RATIO	SIMPLE R2
MEAN	1	285.091					
COL(21)	1	2.35479	5.02	1.71	5.21555	5.02	5.02
COL(23)	1	32.8631	75.08	23.93	14.8901	75.08	65.57
COL(25)	1	2.07796	79.51	1.51	2.07796	79.51	36.89
MODEL	3	37.2958	79.51	9.05			
ERROR	7	9.61326					
TOTAL	10	46.9091					

MEAN SQUARE REGRESSION   12.4319

MEAN SQUARE ERROR   1.37332

PARAMETER ESTIMATION

VARIABLE	COEFFICIENT	STD. COEFFICIENT	STD. ERROR
COL(0)	-2.85323	0	0
COL(21)	.365377	.338164	.18749
COL(23)	.964533	.692521	.292923
COL(25)	.23042	.26099	.187321

PROGRAM NAME: SL—Micro, Version 1.1

DESCRIPTION: A package which has tried to follow as closely as pos-
sible SPSS control card syntax and output formats so
those accustomed to using SPSS can easily adjust to
SL—Micro Routines included are for data entry, fre-
quencies, crosstabs. Pearson correlation, multiple
regression (no residual analysis) and condescriptive
(descriptive statistics). Program does handle missing
values. Data transformations. Utility program for
use of Data Base Management program files. Histo-
grams.

HARDWARE: Runs on a Z80 microprocessor under CP/M. Available
on 8 inch disks or Radio Shack Model II and North Star
with CP/M, IBM—PC (with baby blue board), Osborne and
Apple (with Z80 card), CP/M—80 version planned for
IBM—PC and 8 inch disks. Need 48K and 2 drives. New
CP/M—86 version for 8 inch disks for IBM—PC which
requires CBasic—86. (128K recommended).

LANGUAGE: CBasic 2

AVAILABILITY: Questionnaire Service Company
Box 23056
Lansing, MI 48906
(517/641—4428)

PRICE: $250 (manual for $15)

COMMENTS: Up to 200 variables and 32,600 cases,
depending on disk size (including hard disk). Uses
value labels, permits missing values.

SOURCE OF INFO: Manual.

STATISTICAL PACKAGE FOR MICROCOMPUTERS

THE SP-MICRO CONTROL CARD DECK:

RUN NAME	ACTIVITIES OF 3-5 YEAR OLDS
COMMENT	FICTITIOUS DATA
VARIABLE LIST	CODE,AGE,SEX,SLEEP,PLAYTIME,PLAYACT,WX,ADULT
INPUT FORMAT	FIXED(F3.0,F2.0,F1.0,2F2.0,3F1.0)
INPUT MEDIUM	DISK
N OF CASES	UNKNOWN
DATA FILE	B:KIDS
PAGESIZE	EJECT
VAR LABELS	SLEEP,HOURS/AGE,MONTHS/
	PLAYTIME,HOURS/
	PLAYACT,MAJOR PLAY ACTIVITY FOR THE DAY/
	WX,WEATHER/
	ADULT,ADULT SUPERVISING - HOURS
VALUE LABELS	PLAYACT (1)TELEVISION (2)INSIDE TOYS (3)OUTSIDE TOYS
	(4)OUTSIDE PLAYMATES (5)INSIDE ADULTS
	(6)OUTSIDE ADULT (7)WORK (8)OTHER/
	CODE(007)BETSY(012)TIMMY(013)FRED(022)KATHY
	(024)DAVEY(025)LINDA(031)CAROL/
	WX (1)CLEAR & WARM (2)COLD (3)RAINY/
	SEX (F)GIRL (M)BOY
MISSING VALUES	PLAYACT(8)
FREQUENCIES	GENERAL=AGE
OPTION	STATISTICS
FREQUENCIES	GENERAL=PLAYACT
OPTION	HISTOGRAM
CROSSTABS	TABLES=PLAYACT BY WX
PEARSON CORR	AGE,SLEEP TO ADULT
REGRESSION	VARIABLES=AGE,SLEEP,PLAYTIME,ADULT
	REGRESSION=AGE(2) WITH SLEEP,PLAYTIME,ADULT(1)
	REGRESSION=SLEEP WITH PLAYTIME,ADULT(2)
FINISH	

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
PLAYACT     MAJOR PLAY ACTIVITY FOR T  BY  WX
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                             WX
                   COUNT |
                   ROW PCT |CLEAR  COLD   RAINY     ROW
                   COL PCT |& WARM                  TOTAL
                   TOT PCT |   1      2      3
PLAYACT           ------|------|------|------|
                      1 |    4  |    3  |    2  |     9
TELEVISION            |  44.4 | 33.3  | 22.2  |  37.5
                      |  28.5 | 42.8  | 66.6  |
                      |  16.6 | 12.5  |  8.3  |
                   -|------|------|------|
                      2 |    2  |    1  |    0  |     3
INSIDE TOYS           |  66.6 | 33.3  |  0.0  |  12.5
                      |  14.2 | 14.2  |  0.0  |
                      |   8.3 |  4.1  |  0.0  |
                   -|------|------|------|
                      3 |    3  |    1  |    0  |     4
OUTSIDE TOYS          |  75.0 | 25.0  |  0.0  |  16.6
                      |  21.4 | 14.2  |  0.0  |
                      |  12.5 |  4.1  |  0.0  |
                   -|------|------|------|
                      4 |    1  |    1  |    1  |     3
OUTSIDE PLAYMAT       |  33.3 | 33.3  | 33.3  |  12.5
                      |   7.1 | 14.2  | 33.3  |
                      |   4.1 |  4.1  |  4.1  |
                   -|------|------|------|
                      5 |    3  |    0  |    0  |     3
INSIDE ADULTS         | 100.0 |  0.0  |  0.0  |  12.5
                      |  21.4 |  0.0  |  0.0  |
                      |  12.5 |  0.0  |  0.0  |
                   -|------|------|------|
                      6 |    1  |    1  |    0  |     2
OUTSIDE ADULT         |  50.0 | 50.0  |  0.0  |   8.3
                      |   7.1 | 14.2  |  0.0  |
                      |   4.1 |  4.1  |  0.0  |
                   -|------|------|------|
             COLUMN     14      7      3      24
             TOTAL    58.3   29.1   12.5  100.0
```

CHI SQUARE = 6.2698 WITH 10 DEGREES OF FREEDOM.
NUMBER OF MISSING OBSERVATIONS = 1

V50   EMPLOYER GROUP

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
STATE OF MICHIGAN	1	376	48.2	50.9	50.9
GENERAL MOTORS	2	76	9.7	10.3	61.2
MICHIGAN STATE UNIV	3	78	10.0	10.6	71.7
OTHER GROUP	4	198	25.4	26.8	98.5
NON GROUP	5	9	1.2	1.2	99.7
MEDICARE	6	2	0.3	0.3	100.0
	0	41	5.3	MISSING	
TOTAL		780	100.0	100.0	

MEAN	2.180	STD ERR	0.049	MEDIAN	1.000
MODE	1.000	STD DEV	1.345	VARIANCE	1.809
KURTOSIS	-1.374	SKEWNESS	0.518	RANGE	5.000
MINIMUM	1.000	MAXIMUM	6.000		

VALID CASES   739   MISSING CASES   41

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
V50          EMPLOYER GROUP

CATEGORY LABEL        CODE
STATE OF MICHIGAN       1  |*************************
    (376 = 50.8%)          |
GENERAL MOTORS          2  |*****
    (76 = 10.2%)           |
MICHIGAN STATE UNIV     3  |*****
    (78 = 10.5%)           |
OTHER GROUP             4  |*************
    (198 = 26.7%)          |
NON GROUP               5  |*
    (9 = 1.2%)             |
MEDICARE                6  |*
    (2 = 0.2%)             |
                           |....:....|....:....|....:....|....:....|....:....|
                           0        20        40        60        80       100
                           ADJUSTED FREQUENCY (PERCENT)
```

FREQUENCIES

CROSSTABS

PEARSON CORR

REGRESSION

VAR, VAL LABELS

TRANSFORMATIONS
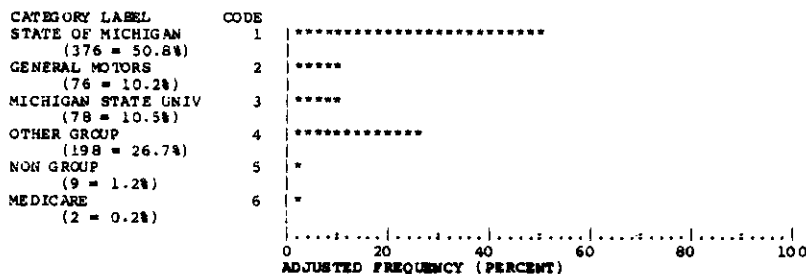
SL-MICRO QUICK REFERENCE SHEET

COMMENT	comment string
COMPUTE	computed variable = arithmetic expression
CONDESCRIPTIVE	variable list
CONVERT	CP/M style output filename
CROSSTABS	TABLES=variable list BY variable list { BY variable list }
DATA FILE	CP/M style input filename
FINISH	
FREQUENCIES	GENERAL=variable list
IF	(logical expression) computed variable = arithmetic expression
INPUT FORMAT	FIXED(Fortran Style format statement)
INPUT MEDIUM	DISK / CARD
MISSING VALUES	variable list(missing value list)
N OF CASES	number of cases / UNKNOWN
OPTION	option names
PAGESIZE	number of lines / EJECT / NOEJECT / WIDE
PEARSON CORR	variable list WITH variable list / variable list /
PRINT BACK	CONTROL / FORMAT / NO
READ INPUT DATA	
RECODE	variable list(value list=new value) . . . (value list=new value)
REGRESSION	VARIABLES=variable list REGRESSION=variable name(n,F) WITH variable list(level)
RUN NAME	title
SELECT IF	(logical expression)
VALUE LABELS	variable list(value)label . . . (value)label/
VAR LABELS	variable name,label/
VARIABLE LIST	variable list

PROGRAM NAME: SpeedSTAT

                    Vol. I: Frequencies and Crosstabs
                    Vol. II Regression and Correlation
                    Vol. III ANOVA, includes experimental design
                    Vol. IV Time Series (July 1983)
                    Vol. V Graphics (Sept. 1983)

DESCRIPTION: SpeedSTAT 1 is Menu Driven. Data Entry, Data Editor, Descriptive Statistics (Frequencies), Crosstabs includes Chi-Square, Cramers V, Lambda, Gamma Kendall's Tau C, Comer's D, Contingency Coeff. C, Spearman's Rho, Pearson Product-Moment Corr., Missing Values, plus valid cases. SpeedSTAT 2 Multiple linear regression, Forward and backward stepwise and selection regression. SS with adjusted v^2. 3 types of correlation and test values. descriptive statistics. Speed STAT 3, ANOVA, Experimental Designs –Randomized, black, split-plot and latin square, with statistics.

HARDWARE: Apple II, 48K, 2 disk drives.

LANGUAGE: BASIC and Machine

AVAILABILITY: Softcorp International
                    229 Haber Village Blvd.
                    Westerville, Ohio 43081
                    (614/890-2820, 800-543-1350)

PRICE: Volume I - $250 (Back-up copy $20)

COMMENTS: SpeedSTAT has the capacity for up to 12,000 data points and 128 variables. Maximum of 2,048 values per variable.

Limits # Variables	#Cases	Values	
5	2,048	Largest Integer	999,900,000
12	1,000	Smallest Integer	99,990,000
22	500	Longest non-integer	3,276.6
47	200	Smallest non-integer	3,276.6
103	50		
200	11		

Detailed, easy to read manual. Employs DIF format for data interchange. Good quality reports. Tool free hotline for questions.

SOURCE OF INFO: Department of Agricultural Economics Demo and Bob Stevens from Speed STAT 1 manual. Promotional Material.

Technical Specifications

SpeedSTAT 2: Regression & Correlation provides rapid access to data sets that can be as large as 12,000 values. Each data set can contain up to 128 variables. Each variable can have a maximum of 2,048 unique values. SpeedSTAT 2's data editor allows for easy insertion and deletion of variables and cases. A powerful set of data transform operations is built in.

SpeedSTAT provides a means of automatically accessing data from most spreadsheet programs. Through use of the well-known DIF™ standard (Data Interchange Format), speedSTAT easily accepts data from many other sources.

REGRESSION

SpeedSTAT regression methods include:

- standard multiple linear regression
- forward stepwise regression
- forward selection regression
- backward stepwise regression
- backward elimination regression

For each data point, Regression will provide the following information:

- predicted values of the dependent variable
- residuals
- standard error of the residual
- standard error of the prediction
- leverage of the data point

SpeedSTAT will also compute the predicted value for data points that are not in the model. For each model, ANOVA tables are produced, which include:

- sum of squares tables with adjusted r^2
- r^2
- coefficient of variation
- root mean square

Parameters included are:

- estimate
- degrees of freedom
- t-value
- Type I sum of squares
- Type II sum of squares

CORRELATION

Three types of correlation, and the corresponding test values, are produced for each variable:

- Spearman's Rho
- Kendall's Tau C
- Pearson Product-Moment Correlation

For each variable, speedSTAT 2 will also provide simple descriptive statistics, including:

- minimum
- maximum
- range
- standard deviation
- mean

Need help? Call speedSTAT's toll free hotline.

Our Technical Service Representatives are ready to answer any questions you have about using speedSTAT.

SpeedSTAT is a trademark of SoftCorp International, Inc.
Apple is a registered trademark of Apple Computer, Inc.
DIF is a trademark of Software Arts, Inc.

SoftCorp
INTERNATIONAL

229 Huber Village Boulevard
Westerville, Ohio 43081

Call toll free: 800/543-1350
In Ohio call: 513/891-5044

Hardware Requirements

Apple II, II Plus or //e with 48K and 2 disk drives

Technical Specifications

SpeedSTAT 1 provides rapid access to data sets that can be as large as 12,000 values. A selection of over 30 different statistical measures is provided. Available statistics include:

Single Variable Analysis

- SIMPLE FREQUENCIES
- FREQUENCY PERCENTAGE DISTRIBUTION
- CUMULATIVE FREQUENCY PERCENTAGES
- MEAN
- MEDIAN
- MODE
- MINIMUM
- MAXIMUM
- RANGE
- SKEWNESS
- KURTOSIS
- SAMPLE STANDARD DEVIATION
- ESTIMATE OF POPULATION STANDARD DEVIATION
- SAMPLE VARIANCE
- ESTIMATE OF POPULATION VARIANCE
- STANDARD ERROR
- # MISSING VALUES
- # VALID CASES

Analysis with Two or More Variables

- TWO-WAY AND N-WAY CROSSTAB TABLES FREQUENCY PERCENT ROW PERCENT COLUMN PERCENT TOTALS PERCENT TOTALS
- CHI SQUARE
- CRAMER'S V
- LAMBDA
- GAMMA
- KENDALL'S TAU C
- SOMER'S D
- CONTINGENCY COEFFICIENT C
- SPEARMAN'S RHO
- PEARSON PRODUCT- MOMENT CORRELATION
- # MISSING VALUES
- # VALID CASES

Hardware Requirements

Apple II, II Plus or //e with 48K and 2 disk drives

SpeedSTAT data sets can hold as many as 2048 cases and as many as 128 variables. Each variable may have up to 128 unique values.

SpeedSTAT provides a means of automatically accessing data from most spreadsheet programs. Through use of the well-known DIF™ standard (Data Interchange Format), speedSTAT easily accepts data from many other sources.

Need help? Call speedSTAT's toll free hotline.

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SpeedSTAT represents many man-years of intensive design and development work by a team whose first priority was to produce a line of statistics products that are designed with the user in mind. As a result, speedSTAT makes your computer do the work, so you're free to think about the results.

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In Ohio call: 513/891-5044

Technical Specifications

SpeedSTAT 3: Analysis of Variance provides rapid access to data sets that can be as large as 12,000 values. SpeedSTAT data sets can hold as many as 2,048 cases and as many as 128 variables. Each variable may have up to 128 unique values.

SpeedSTAT provides a means of automatically accessing data from most spreadsheet programs. Through use of the well-known DIF™ standard (Data Interchange Format), speedSTAT easily accepts data from many other sources.

ANALYSIS OF VARIANCE: TECHNICAL FEATURES

Experimental Designs

Allows any general balanced data design (also performs unweighted means analysis on unbalanced data) with up to 512 cells. Examples of designs accommodated include:

- COMPLETELY RANDOMIZED
- BLOCK
- SPLIT-PLOT
- LATIN SQUARE

Model Specifications

- HIERARCHICAL OR CROSSED (FACTORIAL) FACTORS
- FIXED OR RANDOM FACTORS
- UP TO 64 SEPARATE EFFECTS ALLOWED
- UP TO 6 FACTORS
- UP TO 128 TOTAL LEVELS
- AUTOMATICALLY COUNTS LEVELS PER FACTOR
- AUTOMATIC GENERATION OF ALL INTERACTION TERMS FOR COMPLETELY CROSSED MODELS.

Overall Model Statistics

- ANOVA TABLE
- PROBABILITY OF EXCEEDING F OBSERVED
- R-SQUARE
- ROOT MEAN SQUARE ERROR
- MEAN FOR DEPENDENT VARIABLE
- COEFFICIENT OF VARIATION
- NUMBER OF LEVELS FOR EACH FACTOR
- RANGE OF LEVEL VALUES FOR EACH FACTOR
- NUMBER OF CASES INCLUDED IN COMPUTATIONS

Individual Hypothesis Test Statistics

- Provides standard test for each effect, using the means square residual error term.
- Allows general specification up to 64 additional tests under user control.
- For each test, the Sum of Squares and Degrees of Freedom are provided, as well as the F observed and the probability of exceeding F observed.

Means Summaries

- Computes a table for any modeled effect, including, for each specific mean, the number of observations summed over, and the specific levels for each factor.

Hardware Requirements

Apple II, II Plus or //e with 48K and 2 disk drives

Need help? Call speedSTAT's toll free hotline.

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229 Huber Village Boulevard
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Call toll free: 800/543-1350
In Ohio call: 513/891-5044

PROGRAM NAME: STAN

DESCRIPTION: Menu driven interactive statistical analysis
                     system (except for transformations   which   use   Pascal
                     language).   Four Modules: Data   input and management;
                     Linear models-analysis of variance; Graphics with mul-
                     tople variables; text formator (word processor).

HARDWARE: Any microcomputer system with a properly
                     configured UCSD Pascal system.

LANGUAGE: Pascal

AVAILABILITY: Statistical Consultants, Inc.
                     Park Plaza Office Building
                     462 East High Street
                     Lexington, KY   40508
                     (606) 252-3890

PRICE: $300

COMMENTS: New, easy to use program in Pascal language
                     with limited statistics but including a   word   proces-
                     sor.

SOURCE OF INFO: User's Guide and article in the Journal
                     of Pascal and Ada, September and October, 1982, pp.
                     15-19.

PROGRAM NAME: STAR

DESCRIPTION: More than 40 features for data entry, transformation
                 etc. Programs written so sample size is not limited
                 by computer capacity, more than 100 statistical
                 results. 24 programs including chi-square and derived
                 tests, 2x2 tables, ANOVA, descriptive Statistics and
                 T-Test, 2 and 3 way ANOVA, histogram, repeated measure
                 designs, analysis of covariance (1 and 2 way), Multi-
                 ple correlation and stepwise regression.

HARDWARE: TRS-80, Model II, 64 K, one drive

LANGUAGE: Basic

AVAILABILITY: Integrated Computer Systems, Inc.
                 P.O. Box 483
                 San Juan, Metro Manilla 3113
                 Philippines
                 Tels 78-40-21 and 78-40-72

PRICE: $375 FOB Manila, ₱3,000 (Philippine currency)

COMMENTS: Written by Father Luke Moortgat.
                 The International Price Research Institute in the Phi-
                 lippines has acquired this program.

SOURCE OF INFO: July 1981 correspondence and summary
                 listing of programs.

A. Statistics	Capacities	Notes
Adapted Phi	for 2 by 2 tables	
Alpha coefficient	see test analysis	
Analysis of covariance	sizes per cell: unlimited, can be unequal	
- one-way	3500 levels (16K: 450 levels)	
- two-way	e.q. 54 x 54 cells or 2916 cells or	
	2 x (a+b) + (axb) < 3,200 (16K:500 cells)	
- higher levels:	through stepwise regression approach	
Analysis of variance	sizes per cell: unlimited, can be unequal	
- one-way	unlimited no. of cells	
- two-way	e.q. 1150 x 1150 or 1,322,500 cells	
	or a + b <= 2300 (16K: 250,000 cells)	
- three-way	e.q. 25 x 25 x 25 or 15,625 cells or	
	a + b + c + (axa) + (bxb) + (cxc) < 2,100	
	(16K: 6,000 cells)	
- higher levels:	through stepwise regression approach	
Binomial distribution	any	
Biserial correlation	unlimited sample size	
C-coefficient	if integers: e.q. 104 x 104	(1)
	w/o file: 2000 columns by unlimited rows	
Chi-square (w/ probability)	if integers: e.q. 104 x 104	(1)
	w/o file: 2000 columns by unlimited rows	
Correlation Coefficient	see specific correlation	
Correlation Matrix	77 variables, unlimited sample size	
	(16K: 44 variables)	
Crosstabulation (frequencies)	if integers: e.q. 104 x 104	(1)
Cramer's V	if integers: e.q. 104 x 104	(1)
	w/o file: 2000 columns by unlimited rows	
Descriptive data (mean etc.)	unlimited sample size	
Determinant	95 by 95 matrix (16K: 61 by 61 matrise)	
Discrimination Index	see test analysis	
Distributions	chi-squre, F-ratio, t-value	
Exponential Curve Fit	any	(4)
F : probability (significance)	any	
Factorial	up to 10 to the 30th	
Factorial design	see analysis of variance	
Fischer exact probability	2 by 2 table, n > 2 x 10 to the 20th	
Frequency table	see crosstabulation or specific test	
Friedman test	e.q. 120 x 120	(3)
Goodness of fit	e.q. 104 x 104	(1)
G-index of agreement	2 by 2 tables	
Gamma	e.q. 104 x 104	(1)
Inverse of a Matrix	95 by 95 matrix	(4)
Item Analysis	unlimited	
Item - remaining item correlation: part of test analysis		
Item - total correlation	part of test analysis	
Kendall's Coefficient W	e.q. 120 x 120 (can be unlimited)	(3)
Kurtosis	unlimited sample size	
Least Squares Regression	any	(4)
Likert Scale	unlimited sample size	(4)
Logarithmic Curve Fit	any	(4)
Mann-Whitney U-test	any	(5)
McNemar test	for 2 x 2 tables	
Mean	unlimited sample size	
Mixed design	see analysis of variance (2 or 3-way)	
Multiple correlation	75 variables, unlimited sample size	
	(16K: 40 variables)	

Parabolic Curve Fit	any	(4)
Pearson Correlation	unlimited sample size	
Percentage tables	see crosstabulations	
Phi - coefficient	for 2 by 2 tables	
Point - biserial correlation:	unlimited sample size	
Poisson distribution	any	
Polynomial Regression	any (check computer limitations)	
Power Curve Fit	any	(4)
Predictions	in Pearson r, multiple r, file program	
Probabilities (Significance levels):	Chi-square, F-ratio,t-value	
Random designs	see analysis of variance (2 or 3-way)	
Reliability coefficient	see test analysis	
Repeated measures:		
one-way	see also test-analysis	(4)
two-way	cell sizes: unlimited (and unequal)	
	no. of cells: depending upon extra	
	features: up to 2,500 x 1000 (2)	
Robinson's A	if integers: e.g. 104 x 104	(1)
	without file : any kind	(4)
Simultaneous Equations	66 unknowns (16K: 41 unknown)	
Skewness	unlimited sample size	
Somer's D	if integers: e.g. 104 x 104	(1)
Spearman Rho	if integers: 5,000 pairs	(3)
Standard Deviation	unlimited sample size	
Stepwise Regression	42 variables, unlimited size (16K: 26).	
	(forward and backward possibility)	
t : probability	any	
Test analysis	includes reliability, item corr. etc.	
	e.g. 120 x 50 (or rxc + 2xc + r < 6500)	
	(16K: 2,100 data)	
	twice as much if data are integers	
Tetrachoric correlation	for 2 by 2 tables	
Theta	if integers: e.g. 104 x 104	(1)
Truncated Poisson distribution:	any	
t - tests: for independent samples / correlated (or matched or		
same samples / difference or gain scores:		
	sizes: unlimited and can be unequal	
U test	any	(4)
V - coefficient	if integers e.g. 104 x 104	(1)
	w/o file: 2800 columns by unlimited rows	
W (coefficient W)	see Kendall's coefficient W	
Wilcoxon-signed pair test	any	(5)

B. Files   More than 40 different features for data entry,
checking, correction, comparison, transformation,
generation of new variables (e.g. for interaction
analysis of covariance or polynomial regression) etc.

Can accomodate virtually any sample size

NOTES: (a, b, c stand for no. of levels for factor A, B, and C)
1. for two-way frequency table: max. (rows + 1) x (columns + 1)
   < 11,000 in integer mode or < 5500 in non-integer mode
   (16k:4,000 cells if integers, else 2,000): without file 1,100
   columns by unlimited rows)
2. for two-way repeated measures: max. no. of cells: least no. of
   options: 3 x a + b < 8,500:most: 7 x a + b < 8,500
3. for two-way rank table: max. (rows +1) x (columns + 1)
   < 15,000 in integer mode or < 7,500 in non-integer mode
   (w/o file: even if 16K can be made for unlimited columns by
   unlimited rows).
4. as of this date (March 1, 1983) this part is being improved.

PROGRAM NAME: Stat Pack I

DESCRIPTION: Menu driven, Anova and Covariance Analysis
                   Regression Analysis, General probability File Main-
                   tenance, Display and Print data Description Statis-
                   tics. Random Sample Generation.

HARDWARE: IBM-PC

LANGUAGE: PC-DOS, 1 Disk drive, 64K Ram

AVAILABILITY: Transactions Systems
                   8708 E. 39th Street
                   Tulsa, Oklahoma 74145

PRICE: $225

COMMENTS:

SOURCE OF INFO: Promotional material, June 1983.

PROGRAM NAME: STAT-SYSTEMS

DESCRIPTION: Menu driven. Seven programs. ANOVA, between
                  design and repeated measures, ANCOVA, factor analysis
                  discriminant function, multiple regression, and matrix
                  manipulation. Unlimited number of associations, data
                  transformations. Data entry and editing

HARDWARE: Apple, IBM-PC, TRS-80-I, 48K

LANGUAGE: Basic

AVAILABILITY: PAR, Inc.
                  17408 Gunn Highway
                  P. O. Box 98
                  Odesca, FL   33556
                  (813) 977-3395

PRICE: $295

COMMENTS:

SOURCE OF INFO: LIST Vol. 1, No. 1, Spring 1983, p. 274.

PROGRAM NAME: Statistical Analysis and Advanced Statistical
Analysis. (Radio Shack)

DESCRIPTION: Descriptive Statistics, Histogram, Frequency
Distribution, Analysis of Variance, Analysis of
Covariance, Correlation Matrix, Multiple Regression,
Time Series Analysis, Chi Square, Test Scoring and
Item Analysis, Random Sample, Data File Utility Pro-
gram.

HARDWARE: For Statistical Analysis TRS-80 Model II, 1 Disk
Drive, 64K RAM Advanced Stat. Analysis is available
for Model III, requires 32K and 2 Disk Drives.

LANGUAGE: Machine language.

AVAILABILITY: Radio Shack Computer Center
2519 South Cedar Street
Lansing, MI 48910
(517/372-1120)

PRICE: $99 (Model II version)
$33.95 (Model III version)

COMMENTS: Review in 80 Micro comparing it with
Microstat, June, 1982, pp. 280-281.

SOURCE OF INFO: Lansing Radio Shack dealer, 1983

PROGRAM NAME: Statistical Package for Microcomputers (SPM)
(Version 2.2)

DESCRIPTION: Each module menu driven. The programs include descriptive statistics, linear bivariate regression, linear multivariate regression, bivariate and multivariate nonlinear regression to arbitrary functions, one-way frequency analysis, one-way frequency analysis, one and two-way analysis of variance, and plots for the screen or printer including XY plots, pie charts and histograms. The file utility programs allow extended file editing and manipulation, including adding, changing or deleting variables or observations, application of up to seventeen mathematical transformations nested up to 30 deep, merging and splitting files, and transferring files from one format to another. SPED offers a Visicalc-like alternative for fast, easy data entry and editing. It features analysis of variance with unequal sample sizes, exceptional flexibility in formatting post hoc and planned comparison analysis and computation of percentile ranks of F ratio statistics. Smoothing of data with moving averages. (Probability significance)

All the programs allow for easy input, output transformation and editing of data.

HARDWARE: TRS-80 Models I and III with 48K; Apple; Atari, IBM and CP/M versions in process.

LANGUAGE: Machine

AVAILABILITY: A - Priory Software
Bruce Powel Douglas
1005 W. Main Street
Vermillion, SD   57069
(605/624-4214)

PRICE: $119.95 for the package. Each of 9 programs may be purchased separately for $30.

COMMENTS: File formats different for each module. Menu driven file transformation and manipulation program. Documentation adequate. Numerical techniques used indicated in the manual. A stand-alone cross tabulation program (XTAB 1.0) is sold for $80. is sold for $80.

SOURCE OF INFO: Ad in December '81 Microcomputing and correspondence with programmer. Review in ACCESS March/April, 1983, pp. 7-9.

Multiple Linear Regression

The multiple linear regression program is particularly powerful. It allows any number of groups and any numbers of observations (limited only by memory). It displays the first order correlation matrix, the multiple correlation coefficient, the significance of the correlation, the regression equation, the significance of the coefficients of the regression correlation, and allows the options of switching any variables in the order of the correlation (including any X with the dependent variable Y), calculating a predicted Y for user-input X's, and allows finding the significance of adding any variable or group of variables to the correlation. This latter option is powerful in that the regressions with and without the variable(s) are computed and their significance compared; then the regression statistics for both these regression are displayed. This allows the user to get all the information provided by step-wise regression without this method's inherent problem of lack of flexibility.

Analysis of Variance

The ANOVA program allows for unequal sample sizes in your groups, and calculates the significance the variation among any number of groups with any number of scores (limited only by memory). The basic descriptive statistics of each of the groups is also displayed. The ANOVA program allows for unprecedented flexibility in Post Hoc analysis. Any number of groups may be compared to any other combination of groups for a pair-wise Post Hoc analysis. Experimental-wise error is also calculated.

Two-Way Analysis of Variance

The TANOVA program allows for two-way analysis of variance statistics with all the same flexibility of the ANOVA program, with the exception that equal sample sizes are currently required. Significance for the TANOVA are calculated for simple main effects, group effects, and interaction of variables.

Non-linear Regression and Multiple Non-linear Regression

The non-linear regression programs both use the optimized method of Marquardt using a variable step size, and optimize the Chi-square function to obtain the least-squares best fit. All program parameters have default values, but give you the option of altering the convergence criterion, step size, and maximum number of iterations. The program has a default of using numerical finite-difference equations to calculate the derivatives, but you may alter this very easily to use analytical derivatives instead. Both non-linear regression programs support direct use of the data files from their linear counterparts (see above), and are completely menu-driven. They require only that the fitting function be entered in a specific place (instructions are given both in the manual and in the program), although if the analytical derivatives are desired, they must also be manually entered into the the programs. The variance and the current values of the parameters are displayed at each iteration, and whether the convergence criterion was met is also displayed. The non-linear regression program takes two variables and up to 5 fitting parameters, while the multiple non-linear program takes up to 5 variables and 10 fitting parameters.

EDIT

The EDIT program allows disk (only) users to have expanded editing capabilities for their data files. You may have up to 10 files in memory at once (depending on the size of the files). Your editing options include adding or deleting variables, adding, deleting, or changing observations, paging your data set, or applying mathematical transformations to a variable. There are 17 transformations available, including 3 types of random functions (to aid in certain types of Monte Carlo simulation). These transformations may be nested up to 30 deep. 48K memory required.

FILETRAN

FILETRAN allows for sophisticated data file manipulation. Data files may be merged, concatenated, or dismembered, or they may be transformed into data files suitable for another statistical analysis program. Thus, you may, for example, merge several descriptive data files together into a single multiple regression file, and then, if you wish, change the structure into an Analysis of Variance data file. Due to the size of the FILETRAN program (23K), few of the data files reside in memory all at once, allowing for creative file manipulation performed on even very large data sets. 48K required.

SPM is a very highly versatile and flexible statistical package for the TRS-80 model I/III microcomputer. Both cassette and disk versions are available. Besides the storage medium differences, the disk package also contains two additional programs EDIT and FILETRAN for more sophisticated editing and data set file manipulation. All the programs allow file entering, editing, and I/O, but the EDIT and FILETRAN programs allow for much more sophisticated manipulation. The SPM package supports some functions that are not to be found in any other microcomputer statistical package, such as frequency and contingency tables, non-linear regression, multiple non-linear regression, unprecedented flexibility of Post Hoc analysis, unequal sized groups for Analysis of Variance, and significance of adding variables to multiple linear regression, complete with subcorrelation statistics. All the inferential statistical procedures (except for the non-linear regression) provide F ratio and the probability of the significance of the F ratio. All programs are thoroughly error-trapped. The longest statistical program is packed into 12K of user memory, allowing for large data sets, particularly with 32K and 48K memory systems. The special editing programs provided in the disk system package are much larger, but FILETRAN and EDIT attempt to minimize the amount of data in core memory at any one time.

Since Bruce Douglass is a well known and respected writer for the micro computer, the manual meets the expectations of a complete, readable, and thorough reference. Each program is presented with examples leading the user through each program's operation. Special appendicies cover the exact file structure for each program, the mathematical methods, and suitable references for the interested user. These appendicies are not needed by the casual user, but are provided for the more experienced user who might wish to expand SPM's already impressive capabilities. The manual has a table of contents and a complete index and bibliography. The programs included are:

Descriptive Statistics

This program calculates the mean, standard deviation, and standard error of a group of scores. It contains all its own disk or cassette I/O and data entering and editing routines. It also performs data smoothing and moving averages.

Frequency analysis and contingency tables

The FREQ program has several features that make it a very powerful program. It will take in uni- or multi-variate data files and perform 1- to N-way frequency cross tabulations. It will allow you to group your data and sort it by any variable. The cross tabulation feature will display the percent of total, cumulative percent, row percent, column percent, and chi-square statistic for each cell as well as the descriptive statistics of mean, range, and standard deviation. It not only sends the formatted output to the printer, but also to a tape or disk file to be used with your word processor for managerial reports.

Linear Regression

This programs also contains the data manipulation routines, and calculates the correlation coefficient of two variables, the significance of the correlation, and the linear regression equation coefficients. You are also given the option of calculating a predicted value from the regression equation.

PROGRAM NAME: Statistical Processing System (S.P.S. Version 4.2, 1983)

DESCRIPTION: Menu driven, Data entry and management, transforma-
                  tions, merges. Descriptive statistics, crosstabs,
                  correlation, three regression routines, ANOVA, Factor
                  analysis, scattergrams, histograms, plots of regres-
                  sion functions.

HARDWARE: TRS-80, Model II; Apple II+, Apple IIe (one or two
                  disk drives), IBM-PC and CP/M versions in MBASIC.

LANGUAGES: Applesoft, MBASIC

AVAILABILITY: TRS-80 Model II version from:

                  Dr. R. C. Kirk
                  2495 East Broomfield Road
                  Mount Pleasant, MI 48858 (517) 773-5260

                  CP/M MBASIC Version, Data Base, Inc.
                  Mount Pleasant, MI   48858.
                  The Apple and IBM versions are available at a low
                  price by writing directly to:

                      Dr. Gregory Buhyoff Department of Forestry Virginia
                      Technical University Blacksburg, VA   24061 (703)
                      961-5148

PRICE: TRS-80 Model II and CPM versions - $300
                  ($250 with institutional discount). Apple and IBM
                  versions $25 plus two disks. (No purchase orders) (See
                  above)

COMMENTS: Based on Apple II+ Users Manual Version 4.0.
                  Not recommended for large surveys, more than 700 cases
                  due to loss of computational efficiency. File struc-
                  ture, observations in rows, variables in columns.
                  Memory restriction on file size for 48K system is
                  about 1800 observations for 2 variables, less for a
                  larger number of variables. Can split large files
                  flexibly, to handle a file of 500 observations and 10
                  variables. File conversions for Mainframe, DIF, and
                  VISIplot. SPS precision is 7 significant digits which
                  in most cases was comparable to the IBM 370 Mainframe
                  Statistical Analysis System output (manual p. 108).
                  Good documentation on formulas used. Interfaces with
                  mainframe SPSS easily. Regression routine and file
                  manipulations work well. Comparisons with seven other
                  statistics programs in Staff Paper #82-32.

SOURCE OF INFO: Correspondence Rodney C. Kirk, developer of the TRS-80
                  Model I version and Gregory J. Buhyoff. Geoff Remes,
                  Dept. of Pediatrics and Human Development.

OVERVIEW

The following routines and tests are available on S.P.S. Version 4.0

A.   File Creation and Manipulation

1.   File review and error correction

2.   Write file to disk

3.   Sort for or against variable codes or values

4.   Strip variables from file and create new subset

5.   Deletion of observations

6.   List file to screen and review

7.   List file to printer

8.   Review and change variable labels

9.   Transform variables

10.   Add data to existing file

11.   Merge files

12.   Rank order data file

13.   Recode variable values

14.   Formulate indices from variables

15.   Create special unit vectors within data file

16.   Reorder observations

B.   Descriptive Statistics and Plots

1.   Descriptive Statistics   (mean; s.d.; variance; range; max.;
     min.; mode; 2nd, 3rd, 4th moments; coefficients of skewness and

kurtosis)

2. Histograms and frequency distributions for = 40 intervals

3. X/Y scatter plots to CRT

4. Multiple variable plots to printer

5. Plots of regression functions

    C. Parametric and Nonparametric Correlation

1. Pearson's r

2. Spearman's Rho

3. Point Biserial r

4. Kendall's W

    D. Regression Analysis

1. Simple linear models (linear, power, exponential, logarithmic)

2. Multiple linear regression with residual analysis

3. General linear modeling with residual analysis, CI plots, multicolinearity checks, CP statistics, PRESS residuals, outlier tests.

4. Bartlett's chi square test for homogeneous variances

5. Tests for pooling models

6. Plots of C.I.'s, residuals

    E. Tests for Mean Differences and Analysis of Variance

1. t-tests for equal and unequal sample sizes as well as homogeneous and heterogeneous variances, includes tests for heteroscedasticity

2. ANOVA oneway layout with a-posteriori multiple

comparisons

3. General linear model ANOVA for experimental designs

4. Randomized Complete Blocks ANOVA with multiple comparisons including: Fisher's test, Tukey's Procedure, Duncan's New Multiple Range Test, and Dunnett's Procedure. Also included are Linear and Orthogonal contrasts as well as accompanying t-tests.

    F. Test Distributions

1. t, F, and Chi Square -- yield attained sig. levels given critical values and d.f.

    G. Cross Tabs for R x C Contingency Tables and Qualitative Variables

1. Chi Square, Phi, Cramer's V, Contingency Coef., Somer's D, Pearson's C, Tschruprow's T, Goodman-Kruskal Tau-Y, Tau-A, Gamma and Tau-B

    H. Monte Carlo Variable Distributions

    1. Uniform, Normal and Lognormal.

    I. Multivariate Analysis of up to 50 x 50 correlation matrices

1. Principal components

2. Factor analysis

3. Image analysis

    J. File Structure Transformation for preparing S.P.S. files as a card image and other formats used by other APPLE software.

PROGRAM NAME: The Statistician

DESCRIPTION: Menu driven. More than 50 statistical procedures.
                  Five multiple regression procedures (including step-
                  wise, backward elimination, least squares, all subset,
                  and ridge), 24 transformations, comprehensive data
                  base manager (with search and sort), descriptive
                  statistics, hypothesis testing (7 tests), time series
                  analysis (7 models), random variate generation,
                  discrete probability distributions, sampling distribu-
                  tions, nonparametrics (5 tests), and complete documen-
                  tation. Histograms. Data entry and modification.

HARDWARE: TRS-80, Models I, II, III; CP/M, IBM-PC
                  (June '83) and XENIX (June '83).

LANGUAGE: BASIC

AVAILABILITY: Quant Systems
                  Box 628
                  Charleston, South Carolina   29402
                  (803/571-2825).

PRICE: $125 The Statistician plus shipping
                  $ 70 Multiple Regression 2.0
                  $ 50 Multiple Regression 1.0
                  $ 45 Linear Programming
                  $ 45 Zero-One Programming
                  $ 40 Differential Equations
                  $ 40 Queuing Statistics
                  $ 40 STAT-PACK

                  Add $2.00 for shipping
                  Foreign Orders Add $7 for shipping.

COMMENTS:

SOURCE OF INFO: Promotional literature, February 1983.

DATA TRANSFORMATIONS

There are a total of 24 data set transformations: ABS(X), EXP(X), LN(X), Normalization, nth difference, nth order lag, additive and multiplicative accumulation, vector reversal, vector rotation (nth order). In addition, two variables or a variable and a constant can be added, multiplied, subtracted, or divided. There is a special transformation for converting data to different time periods. For example, converting daily data to weekly data. There is also a provision for generating a constant vector of any dimension.

DESCRIPTIVE STATISTICS

The user can obtain the arithmetic, geometric, and harmonic means as well as the median, variance, standard deviation, mean absolute deviation, range, and maximum and minimum values. In addition, histograms can be displayed on the screen or printer.

HYPOTHESIS TESTING

THE STATISTICIAN will compute the test statistics for the following tests: single mean, single variance, difference in variances. Also one way and two way Analysis of Variance can be performed and the associated ANOVA tables be presented.

TIME SERIES ANALYSIS

This component computes time series forecast using the following models: moving averages, single exponential smoothing, double exponential smoothing, sinsusodial models, Holt's two parameter linear exponential smoothing, Winter's exponential smoothing model, and adaptive filtering. Plots of forecasted versus observed data points can be displayed on the screen or plotted on the printer. Also, a single series can be plotted on the screen or printer. Mean Squared Error and Mean Absolute Deviation of the forecast are also printed.

NONPARAMETRIC STATISTICS

The following nonparametric tests can be performed: Median test, Mann Whitney Test, Kolmogorov-Smirnow, Wilcoxon Signed Test, Kruskal-Wallis, Spearman's Rho, and the Runs Test.

RANDOM VARIATE GENERATION

The user can generate random variates from the Uniform, Normal, Gamma, Exponential, Binomial, Poisson, and Geometric random variables. This data is written to disk and becomes part of your data base.

GENERATE RANDOM SAMPLES

The user may generate some or all random samples of a given size from a data set. The program will calculate the mean, median, and variance of each sample and add them to your data base. There is a special provision to provide histograms of the mean and median values even if they are too numerous to store on disk.

The package is available for the TRS-80 model I,II, and III and will soon be availabe for the CPM operating system.

MULTIPLE REGRESSION ANALYSIS

This component permits the user to estimate a linear model using one of several estimation procedures including stepwise, all subset, backward elimination, ridge, and least squares. In addition to the estimates of the coefficients, their t-values, and standard errors, the user may display or print the variance/covariance matrix, correlation matrix, ANOVA table, F statistic, Durbin Watson statistic, and the coefficient of determination (R^2). Moreover, the predicted values, observed values, and residuals can be plotted or listed on the printer. In addition the predicted values can be saved to disk and be used in the estimation of simultaneous equations.

PROGRAM NAME: Statistics (Basic Business Software)

DESCRIPTION: Menu driven. Data entry from keyboard or disk,
                  descriptive statistics, two-way ANOVA, multiple linear
                  regression, curve fitting, contingency tables, a
                  series of distributions.

HARDWARE: Apple II

LANGUAGE: Basic

AVAILABILITY: Basic Business Software
                  P. O. Box 26311
                  Las Vegas, NV   89126

PRICE: $75.00

COMMENTS:

SOURCE OF INFO: Promotional literature.

PROGRAM NAME: Statistics With Daisy (See at end of Comments)

DESCRIPTION: Command Driven. "...excells on user convenience
                   and offers a full range of statistical capabilities:
                   Mathematical and time-series transforms, Elementary
                   statistics (mean, standard deviation, etc.), Correla-
                   tions, Multiple regression (6 different procedures),
                   Model testing and evaluation, Nonparametric statis-
                   tics, Hypothesis testing, Analysis of variance.
                   Includes plots, inter- face with Visicalc and DB Mas-
                   ter using DIF files.

HARDWARE: Apple II, 48K, DOS 3.3, one or 2 drives.

LANGUAGE: Basic

AVAILABILITY: Rainbow Computing, Inc.
                   9719 Reseda Boulevard
                   Northridge, CA 91324
                   (800/423-5441 for mail order;
                   213/349-0300 for information).

PRICE: $79.95 + $2.50 shipping plus handling

COMMENTS: Easy to learn, data easy to merge and transform.
                   Does not allow unequal sample sizes, (No missing data)
                   Documentation weak (Peelings), Some routines slow. A
                   calculation error (Peelings). Users can add their own
                   routines as New Daisy commands. Default matrix 10
                   variables by 272 observatins (Range 2 x 666 to 20 x
                   141). Over 100 commands. Help command, 15 types of
                   data transformations. Interface to Appleplot. high
                   performance cost ratio. Plotting appears weakest
                   part. Split screen capability. Reviews in in Cider
                   Press, Feb.-Mar. 1982, p. 30-31; The Computing
                   Teacher, April 1982, p. 54; Softalk, Oct. 1982, p.
                   150; Educational Technology, June 1982; Peelings,
                   May/June 1982, p. 47-50. Note: A new version has
                   just been released (Summer '83) at a price of $199.95.

SOURCE OF INFO: Reviews and flyer, February 1983.

Statistics with DAISY

Appendix B - Technical Details

DATA FILE LAYOUT

All data files used directly by DAISY (that is, used with the ENTE, SAVE, EXAM, or OVER commands) have a name beginning with "DAISY.". The commands are written so that this prefix need not be entered.

The data files are stored as follows. First, the size of the table is written, followed by the data, and finally the column names:

Element	Contains
=======	========
1	number of active rows
2	number of active columns
3	value of row 1, column 1
4	value of row 1, column 2
...	...
c+2	value of row 1, column c
c+3	value of row 2, column 1
...	...
...	...
c*r+2	value of row r, column c
c*r+3	name of column 1
c*r+4	name of column 2
...	...
c*r+c+2	name of column c

If the application demands it, you can use non-DAISY files from within DAISY by using your own extension routine.

statistics with DAISY

Assistance

HELP	List all commands
INFO	Info about a particular command

Shorthand Notation

Command may be followed by:
column name or number: *
file name: **

Data Entry

RDIM	Redimension the data table (default 10x272)
DATA	General data entry and changing
ENTE	Enter data from keyboard
ENTE **	Enter data from keyboard or a file
OVER **	Overlay with data from a file
CHGO	Change one value

DATA Command

?	Help, get instructions
↑	Move down or right
↓	Move up or left
carriage return	move to first value in next row or column
D	Change direction of movement
/	Enter a single value
S	Split or unsplit screen
; or 0	Move to other side of screen
ESC	Leave DATA and return to DAISY proper

Errors:
one beep: attempt to move past edge
two beeps: illegal entry

Data Examination

QUIK	Quickly look at a column
DATA	Review the table
#PRT	Print all or part of the table

Data Creation

ZERO	Create a data table containing all zeroes
INDX *	Create a series of numbers in a column
RAND *	Fill a column with random numbers
RANK *	Rank values in a column, place ranks in another
CATE *	Categorize values in a column

Moves

MOVE *	From one column to another
MOVF *	Fitted values into a column
MOVR *	Residual values into a column

Deletes

DELR	A row
DELB	A block of rows
SELR	Selected rows

Recovery

RECR	A row
RECO	All rows
RECB	All rows within a block

Permanent Deletes

CLRC	Clear a column (remove it)
PURG	Get rid of all deleted rows and cleared columns

Mathematical Transforms

On one column:

ABSO *	Absolute value
EXPO *	Exponential
INTE *	Integer
INVE *	Inverse (1/x)
LOGE *	Natural log
LOGi *	Log, base 10
STAN *	Standardization

On one column and a constant:

ADDC *	Add
MULC *	Multiply
DIVC *	Divide
POWE *	Power

(Subtraction is addition of a negative)

On two columns:

ADDV	Add
SUBV	Subtract
MULV	Multiply
DIVV	Divide

Time-Series Transforms

CTOT *	Cumulative totals
DIFF *	Differences
LAGG *	Lag the data
LEAD *	Lead the data

Sorts

SORT *	Sort a column
PSOR *	Paired sort
TSOR *	Table sort

(Also see RANK under "Data Creation")

Elementary Statistics

MEAN Mean and standard deviation
STAT * Mean, standard deviation, variance, standard error, minimum, maximum, range, sum

Frequency Counts

FREQ * Frequency table
HIST * Histogram (if printed)

Graphics

SEQU Sequence plot (Hi-Res)
SEQUL Sequence plot, log scale (Hi-Res)
HIST * Histogram (Lo-Res)
PLOT Scatter plot (Hi-Res)
PLOTLX ...semilog, X-axis
PLOTLY ...semilog, Y-axis
PLOTLL ...log-log scatter plot

To print Hi-Res plots later:

SAVP Save plot to a file

Correlation

COVA Covariances
CORR Correlations
PARC Partial correlations
AUTO * Autocorrelation

Nonparametric Correlation

SPEA Spearman rank correlation (rho)
KENR Kendall rank correlation (tau)
KENP Kendall partial rank correlation
KENC Kendall coefficient of concordance

Hypothesis Testing

RUNS Runs test about mean
RUNX Runs test about a given value
ANV1 Analysis of variance, one way
ANV2 Analysis of variance, two way
ANOV Analysis of variance for regression
CHIS Chi-square
TTES T-test
COCH Cochran Q-test
MANN Mann-Whitney U-test
FRIE Friedman two-way analysis of variance

Specifying a Regression

(Note: shorthand would denote dependent variable)
REGR * Specify a simple or multiple regression
ALLS * All subsets of possible independent variables
SUBS * All such subsets of a given size
BACK * Backward stepwise regression
FORW * Forward stepwise regression
SHEE * Sweep a variable in or out of regression

Testing a Regression

SUMM Summary statistics
COEF Regression coefficients
ANOV Analysis of variance
DURB Durbin-Watson statistics
BETA Beta weights
PLUG "Plug" values into a regression equation

(Also note that FITTED and RESIDUAL are available)

Using Disk Files

Filenames: DAISY.XXX --data file (accessed as XXX)
            DAISY:X   --program module
            DAISY:#XXX --extension (accessed as #XXX)

CATA Catalog (excludes program modules)
ENTE ** Enter data from a file
SAVE ** Save data onto a file
EXAM ** Examine a file without disturbing data table
OVER ** Overlay existing data with data from a file

DOS Commands

Standard DOS commands may be issued from within DAISY.
Just type a Control-D and then the command.

Printing Reports

PRON Printer on
PROF Printer off
; Printer control: whatever follows is sent to the printer

Miscellaneous

QUIT or EXIT Leave DAISY
NAME List column names
CHGN List column names, change if desired
TEXT Comment: remainder is ignored
: Comment or printer control: remainder is sent to printer
; Clear the screen
FREE Amount of memory remaining unused
' Extension

PROGRAM NAME: StatPac

DESCRIPTION:

Menu-drive Programs; User Created Codebook; Accepts up to 255 variables; and 5,000 cases Machine Language Code allowing fast data entry; Fast and easy editing; Hundreds of tasks can be specified at one time; Reports may be custon designed; Screen prompting to guide user; Automatic Back-up of data to protect against system crashes; File uploading and downloading from mainframes; All phases of research analysis, including:

Write subfile, Frequency distribution, Descriptive statistics, Crosstabs, and chi-square, Correlation and linear regression, T-test, Multiple linear regression, Analysis of variance, Multiple variable response

HARDWARE: IBM-PC and C/M version expected, 2 disk
                  drives, 128K RAM (For TRS-80 version see Maxi Stat)

LANGUAGE: Machine language

AVAILABILITY: Walonick Associates
                  5624 Girard Avenue, South
                  Minneapolis, MN   55419
                  (612/866-9022)

PRICE: Manual $30, IBM version $400

COMMENTS: Data Management strong, excellent crosstabs output. Comparison with seven other programs in Staff Paper #82-32.   Enhanced from TRS-80 version (now named Maxi Stat)

SOURCE OF INFO: Manual and vendor publicity, Roy Black of the
                  Michigan State University Agricultural Economics Department has a manual for TRS-80 version.

MALONICK ASSOCIATES - COMPUTER DIVISION 2/5/81

T-TEST FOR INDEPENDENT GROUPS - READING SCORES MALES VS FEMALES

VARIABLE UNDER ANALYSIS - READING SCORE

VARIABLE USED TO GROUP CASES - SEX

GROUP 1   M/
M=MALE

        NUMBER OF CASES   = 7
        MEAN   = 73.71
        VARIANCE   = 176.78
        STANDARD DEVIATION   = 13.3
        STANDARD ERROR OF THE MEAN = 5.43

GROUP 2   F/
F=FEMALE

        NUMBER OF CASES   = 10
        MEAN   = 74.1
        VARIANCE   = 481.09
        STANDARD DEVIATION   = 21.93
        STANDARD ERROR OF THE MEAN = 7.31

              T-TEST STATISTICS

    DIFFERENCE (MEAN X - MEAN Y)   = -.386
    STANDARD ERROR OF THE DIFFERENCE   = 9.896
    T - STATISTIC   = .039
    DEGREES OF FREEDOM   = 15
    PROBABILITY OF T (ONE TAILED TEST)   = .484
    PROBABILITY OF T (TWO TAILED TEST)   = .968

MALONICK ASSOCIATES - COMPUTER DIVISION 4/20/81

ANALYSIS OF VARIANCE - EFFECT OF RACE ON READING SCORES

Dependent Variable - READING SCORE

Anova Summary Table

Source of Variation	DF	Sum of Squares	Mean Squares	F	Significance Level
Between Groups	2	5119.48	2559.74	13.051	0.000
Within Groups	25	4903.47	196.14		
Total	27	10023			

Group Statistics

Group	Codes & Labels	N	Mean	SD
Group 1 -	A/ A=WHITE	7	82.86	9.79
Group 2 -	B/ B=BLACK	11	48.27	18.56
Group 3 -	C/ C=OTHER	10	62.4	9.9

t-test Between Group Means - (Values of p are for a two-tailed test)
----

t = 5.107   Group 1
p = .000   Group 2

t = 2.964   Group 1
p = .012   Group 3

t = 2.309   Group 2
p = .046   Group 3

TEST RUN OF THE NEW CHI SQUARE PROGRAM

COMPARISON OF LIBRARY USAGE FOR DIFFERENT MAJORS

                    MAJOR FIELD OF STUDY - (X AXIS)
    - - - - BY - - - -
                    LIBRARY USAGE - (Y AXIS)

	OBSERVED EXPECTED (O - E) CONTRIBUTION	PSYCH. 0	SOCIOL OGY 1	ROW TOTALS
USED LIBRARY	0	47 55.6 -8.6 1.2	62 53.4 8.6 1.2	109 2.4
DID NOT USE LIB.	1	58 49.4 8.6 1.3	39 47.6 -8.6 1.4	97 2.7
COLUMN TOTALS		105 2.5	101 2.6	206 5.1

    CORRECTED CHI SQUARE   = 5.06   VALID CASES   = 206
    DEGREES OF FREEDOM   = 1   MISSING CASES = 3
    PROBABILITY OF CHANCE = 0.024   RESPONSE RATE = 98.6 %
    PHI   = 0.157
    CONTINGENCY COEFF.   = 0.155

TEST RUN OF THE NEW CORRELATION & LINEAR REGRESSION PROGRAM

SCORE ON COLLEGE ENTRANCE EXAM AS A PREDICTOR OF GPA
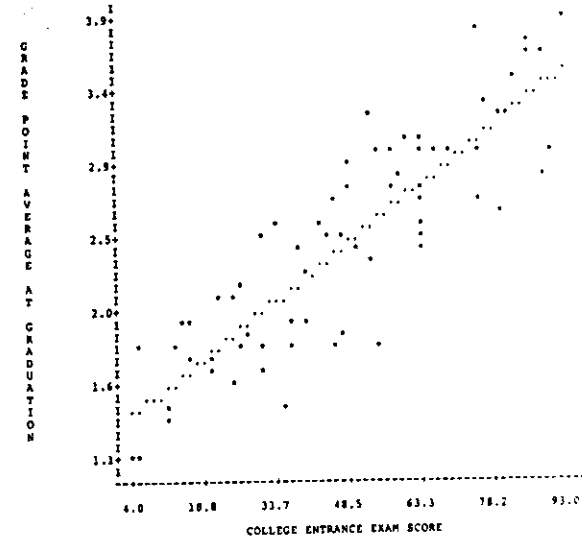
COLLEGE ENTRANCE EXAM SCORE

    MEAN OF X = 48.23   CORRELATION COEFFICIENT = .87   VALID CASES   = 71
    S.D. OF X = 23.99   DEGREES OF FREEDOM   = 69   MISSING CASES = 4
    MEAN OF Y = 2.46   SLOPE OF REGRESSION LINE = .02   RESPONSE %   = 94.
    S.D. OF Y = .67   Y INTERCEPT   = 1.29

    REGRESSION EQUATION : Y' = .02 X + 1.29
    STANDARD ERROR OF ESTIMATE FOR REGRESSION   = .33
    STANDARD ERROR OF CORRELATION COEFFICIENT   = .12
    SIGNIFICANCE OF CORRELATION COEFFICIENT   = 0.000

WALONICK ASSOCIATES - COMPUTER DIVISION 4/20/81

MULTIPLE LINEAR REGRESSION - EFFECTS OF VARIOUS SCORES ON GPA

Regression Statistics

Coefficient of Multiple Determination = .875 (Corrected = .868)
Coefficient of Multiple Correlation = .935 (Corrected = .932)
Standard Error of Multiple Estimate = .356 (Corrected = .366)

Regression Sum of Squares = 15.095
Residual Sum of Squares = 2.158
Total Sum of Squares = 17.252

F-Ratio = 39.644
Degrees of Freedom = 3 & 17
Probability of Chance = 0.000

Number of Valid Cases = 21
Number of Missing Cases = 0
Response Percent = 100 %

Regression Coefficients

Var.	Variable Label	Mean	S.D.	Coeff.
DV	GRADE POINT AVERAGE	2.62	0.93	
K	Constant			0.378
IV1	VERBAL ABILITY SCORE	61.81	27.12	0.010
IV2	WRITING ABILITY SCORE	53.95	23.82	0.021
IV3	READING COMPREHENSION SCORE	56.57	22.45	0.008

Correlation Matrix

	DV	IV1	IV2
IV1	0.832		
IV2	0.874	0.694	
IV3	0.799	0.800	0.671

WALONICK ASSOCIATES - COMPUTER DIVISION 4/20/81

DESCRIPTIVE STATISTICS FOR VARIABLE # 1

AGE (IN YEARS)

Minimum	= 10
Maximum	= 60
Range	= 50
Sum	= 784
Mean	= 27.034
Median	= 21
Modes (Bimodal)	= 12 & 21
Variance	= 207.137
Standard Deviation	= 14.392
Standard Error of the Mean	= 2.72
95 Percent confidence interval around the mean	21.704 - 32.365
99 Percent confidence interval around the mean	20.031 - 34.038

* UNBIASED ESTIMATES OF POPULATION *

| Variance | = 214.534 |
| Standard Deviation | = 14.647 |

* DATA DISTRIBUTION COEFFICIENTS *

Skewness = .791

Kurtosis = -.448

Valid Cases = 29
Missing Cases = 0
Response Percent = 100.0 %

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FREQUENCY DISTRIBUTION FOR VARIABLE 3

CANDY PREFERENCE	NUMBER	PERCENT
A = YUMMIE-CHEWIES	6	26.1 %
B = MUNCHIE-MARVELS	8	34.8 %
C = NO PREFERENCE	9	39.1 %
TOTAL	23	100.0 %

MISSING CASES = 0
RESPONSE PERCENT = 100.0 %

WALONICK ASSOCIATES - COMPUTER DIVISION 2/5/81

ANALYSIS OF VARIANCE FOR PREGROUPED DATA - FINAL TEST SCORES

ANOVA SUMMARY TABLE

SOURCE OF VARIATION	DF	SUM OF SQUARES	MEAN SQUARES	F	SIGNIFICANCE LEVEL
BETWEEN GROUPS	2	5593.71	2796.86	17.763	0.000
WITHIN GROUPS	57	8974.74	157.45		
TOTAL	59	14568.45			

GROUP STATISTICS

GROUP	N	MEAN	SD
TEXTBOOK 1	20	55.95	13.42
TEXTBOOK 2	20	66.4	14.15
TEXTBOOK 3	20	79.55	9.25

PROGRAM NAME: STATPAK (Northwest Analytical)

DESCRIPTION: Most programs menu driven, Data entry. Most data
                    base management program files can be used.   Frequency
                    Dist.   Descriptive   Statistics.   Multiple   linear
                    regression, correlation, 3-way ANOVA. Plots in ASC II
                    characters. Over 80 programs.

HARDWARE: CP/M, IBM-PC, 5 1/4 + 8 inch formats.

LANGUAGE: Basic

AVAILABILITY: Northwest Analytical, Inc.
                    P. O. Box 14430
                    Portland, OR 97214
                    (503) 224-7727

PRICE: $495, Manual $25

COMMENTS: ASCII text file for data, interfaces with
                    data base management programs and work processor pro-
                    grams. Equations used documented.

SOURCE OF INFO: Nefferdorf List and promotional literature.

STATPAK LIBRARY FUNCTIONS

FILE UTILITIES

STATPAK uses ASCII text files as the data structure. This allows easy transfer of data to and from databases, word processors, etc. The user may use STATPAK as a totally stand alone product or may interface with other system software.

The file utilities provide the following functions:

File creation and editing
File merging
Formatting for report generation
Missing data flagging
Format conversion
Lagging
Sorting

MATHEMATICAL UTILITIES

These utilities provide for data manipulation and include:

Deseasonalization
Function generator
Plot (X-Y, with user definable parameters)
Rank order
Random number generator
Subset selection
Data transformation
Curve smoothing
Summation of intervals (cross tabulation)

PROBABILITY CALCULATIONS

Factorial
Combination
Permutation

Probability of
No Repetition
Bayes Formula

SINGLE VARIABLE STATISTICS

Descriptive Statistics
Standard Deviation
Means: Arithmetic
  Geometric
  Harmonic
  Quadratic
Coef. of Variation

Standard Error
Moments About Mean
  1st, 2nd, 3rd, 4th
Coef. of Kurtosis
Coef. of Skewness

Moving Average
Standardized Scores

Generalized Mean
Frequency Histogram

REGRESSION AND CORRELATION

Single Variable
Linear
Exponential
Logarithmic
Power
Polynomial

Multiple Linear
Forward Stepwise
Multi-way Correlation
Residual Analysis

TIME SERIES

Auto-Correlation
Cross-Correlation

Fourier Analysis

NON-PARAMETRIC STATISTICS

Kendall's tau
Kruskal-Wallis
Mann-Whitney
Spearman Rank

Wilcoxon Signed-Ranks
Friedman 2-way ANOVA
Kolmogorov-Smirnov
"goodness of fit"

DISCRETE DISTRIBUTION FUNCTIONS

Binomial
Hypergeometric

Negative Binomial
Poisson

CONTINUOUS DISTRIBUTION FUNCTIONS

Bivariate Normal
Chi-squared
Exponential
F
Gamma Function
Incomplete Gamma Function

Inverse Normal
Khrgian-Mazin
Logarithmic Normal
Normal
t

MEANS TESTING

One Sample t
Paired t
Pearson "r"

t Statistic for 2 Means
Test Statistics: t and z

SURVEY DATA AND CONTINGENCY TABLES

Chi-Square:
Bartlett Statistic
Equal Frequencies
Unequal Frequencies
Cross tabulation

Fisher's Exact Test
Contingency Table
Difference Among
  Proportions

ANALYSIS OF VARIANCE

One-way
One-way, 1 repeated
  measure

Two-way
Two-way, 1 repeated measure
Two-way, 2 repeated measures

Three-way
Three-way, 1 repeated measure
Three-way, 2 repeated measures

Note: 2- and 3-way ANOVA require even design

---) ONE INDEPENDENT VARIABLE REGRESSION (---

MAXIMUM # of Data Pairs? 22

-- Select Desired Regression(s) --
Linear: A+(B*X) (Y/N)? Y
Exponential: A*EXP(B*X) (Y/N)? Y
Logarithmic: A+B*LOG(X) (Y/N)? Y
Power Curve: A*X^B (Y/N)? Y

X = Data Column # 1
Y = Data Column # 2

Name of Input File: REGTEST
# of columns in Input File? 2
File Column for Data Column # 1 - ? 1
File Column for Data Column # 2 - ? 2
....

Output to Screen, Printer, File - or Quit (S,P,F,Q)? S
Skip Detail Data (Y/N)? N

---) ONEVREG (REGTEST): SAMPLE RUN   PAGE 1

X	A+(B*X)	A*EXP(B*X)	A+B*LOG(X)	A*X^B	Y
5	21.2428	21.2566	16.7358	17.5229	16.5
10	21.8904	21.8033	20.2262	20.2012	20.2
15	22.538	22.3639	22.2679	21.9539	22.7
20	23.1856	22.939	23.7166	23.2889	24.8
25	23.8332	23.5289	24.8402	24.3801	24.6
30	24.4808	24.1339	25.7583	25.3095	25.5
35	25.1284	24.7545	26.5346	26.1229	25.9
40	25.776	25.3911	27.207	26.8485	27.2
45	26.4236	26.044	27.8001	27.5053	27
50	27.0712	26.7137	28.3306	28.1065	29
55	27.7188	27.4007	28.8106	28.6616	27.9
60	28.3664	28.1053	29.2487	29.1779	29.5
65	29.014	28.828	29.6518	29.6611	29.8
70	29.6616	29.5693	30.025	30.1156	30
75	30.3092	30.3297	30.3724	30.545	30.5
80	30.9568	31.1096	30.6974	30.9522	30.5
85	31.6044	31.9096	31.0027	31.3397	31.6
90	32.252	32.7302	31.2905	31.7094	30.8
95	32.8996	33.5718	31.5627	32.0632	31.9
100	33.5472	34.4351	31.821	32.4025	32

	A+(B*X)	A*EXP(B*X)	A+B*LOG(X)	A*X^B
A REG COEFF	20.5953	20.7237	8.63131	12.5944
B REG COEFF	.129519	5.07797E-03	5.03559	.2052
A STD ERROR	.726969	.0367028	.552297	.0284597
B STD ERROR	.0121372	6.12779E-04	.144979	7.47075E-03
STD ERR EST	1.56495	.0798104	.513596	.0264655
COEFF DET	.863509	.792019	.985301	.97629
COVARIANCE	113.329	4.44322	3.32604	.135536
CORR COEFF	.929252	.889955	.992623	.988074
DURBN-WATSN	.594394	.480337	2.59095	1.90443

---) 3-WAY ANOVA: 2 REPEATED MEASURES (---

Levels of Factor A ? 2
Levels of Factor B (Repeated Measures)? 4
Levels of Factor C (Repeated Measures)? 2
# of Subjects/Cell? 8

-- 8 Data Columns (B & C, w/ C varying most rapidly)
-- ROWS: Subjects grouped by Levels of A

Name of Input File: ANOVATES.T
# of columns in Input File? 8
File Column for Data Column # 1 - ? 1
File Column for Data Column # 2 - ? 2
File Column for Data Column # 3 - ? 3
File Column for Data Column # 4 - ? 4
File Column for Data Column # 5 - ? 5
File Column for Data Column # 6 - ? 6
File Column for Data Column # 7 - ? 7
File Column for Data Column # 8 - ? 8

Total # of Subjects (rows) = 16

....
Output to Screen, Printer, File - or Quit (S,P,F,Q)? S

	SUM OF SQUARES	DEGREES FREEDOM	MEAN SQUARE	F-TEST RATIO
FACTOR A	1617.39	1	1617.39	33.8887
ERROR	668.172	14	47.7266	
FACTOR B	33903.1	3	11301	775.996
A TIMES B	1874.66	3	624.886	42.9084
ERROR	611.656	42	14.5632	
FACTOR C	5369.09	1	5369.09	1068.1
A TIMES C	110.641	1	110.641	22.0102
ERROR	70.375	14	5.02679	
B TIMES C	223.672	3	74.5573	10.2611
A * B * C	375.547	3	125.182	17.2285
ERROR	305.172	42	7.266	

Output to Screen, Printer, File - or Quit (S,P,F,Q)? Q
0#

---> MULTIPLE LINEAR REGRESSION <---

Output Residuals to a File (Y/N)? N

# of X-values/Y-value (P)? 3

Data Column 1 = Dependent Variable (Y)
Columns 2 - 4 = Independent Variable (X Matrix)

Name of Input File: REGSALES
# of columns in Input File? 4
File Column for Data Column # 1 - ? 1
File Column for Data Column # 2 - ? 2
File Column for Data Column # 3 - ? 3
File Column for Data Column # 4 - ? 4

Determining Matrix Size...........................
--> 24 Dependent Variable (Y) Values

Reading Data...........................
Working...
Output to Screen, Printer, File - or Quit (S,P,F,Q)? S

TERM	COEFFICIENT	T-TEST
B 0	-17.7109	
B 1	.201423	3.86226
B 2	.667411	3.7255
B 3	.627072	6.60873

	SUM SQ	DEG FR	MEAN SQ
DUE TO REGRESSION	9370.1	3	3123.37
ABOUT REGRESSION	289.731	20	.14.4866
TOTAL	9659.83	23	419.993

R-SQUARED   .970887
F-TEST   215.604
DURBIN-WATSON 1.49443

LOW LIMIT	(DX = 10 SCALE = 2:1)	Data Plotting Sample
0	!::::	
10	!::::*:::	
20	!::::*::::*::::*::::*	
30	!::::*::::*::::*::::*::::*::::*::	
40	!::::*::::*::::*::::*::::*::::*::::*::::*::::*:	
50	!::::*::::*::::*::::*::::*::::*::::*::::*::::*::::*::::*::	
60	!::::*::::*::::*::::*::::*::::*::::*::	
70	!::::*::::*::::*::::*::::*	
80	!::::*::::	
90	!::::*	
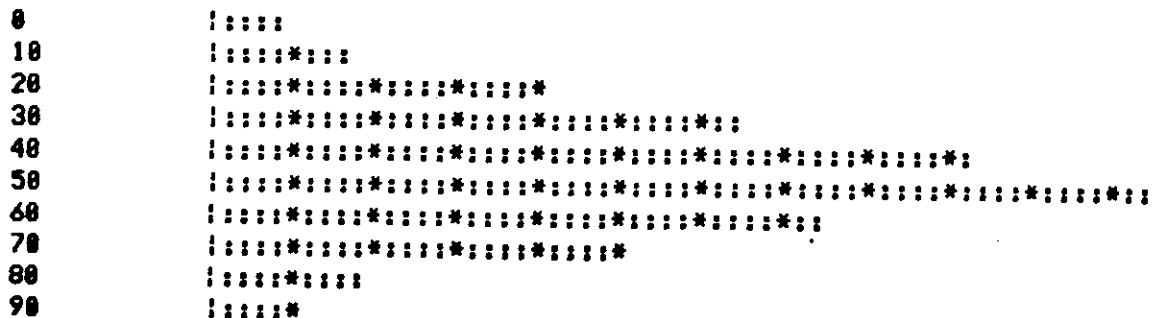
PROGRAM NAME:	Statpro

DESCRIPTION:

"The Statistics and Graphics Database Workstation" Database, Statistics, and Graphics. Menu driven. Statpro is grouped into a modular format for sales purposes yet which allows the user to transfer data between modules and other programs with easy to use prompts. Statpro Database module include: data transformations, questionnaire database, mailing label databese, general category database, graphic printing and editing, Corvus and Profile compatible. Sample data for first time use. The five statistics modules include descriptive regression analysis (multiple linear and non- linear, step-wise), analysis of variance, time series, multivariant.

Statpro, data bases limited in size to disk space. Transformations include arithmetic logarithmic, exponential, trigonometric, powers and square roots, conversions, random numbers, standardized observations and over 40 English to metric or metric to English conversions.

The four Statpro Graphics modules are Scatter, Statplot, Curvefit and Multiplot Extensive color graphics capabilities, a graphic screen editor, multiple plots per screen, user or computer defined access limits, and choice of symbols and lines. Triangle plot, up to 3 graphs per screen, Variance plot and moving averages, Linear regression, dot and line plot, residuals plot, cluster analysis and star plot.

HARDWARE:

Apple II (Apple III version available), IBM-PC (expected)

LANGUAGE:

Pascal (completely compiled)

AVAILABILITY:

Wadsworth Electronic Publishers
20 Park Plaza, Suite 1423
Boston, MA   02116
(800-322-2208)

PRICE:

$250 for STATMOD only. Additional cost for interfacing programs such as PLOTMOD and database communicator. Total set costs $1,995.

COMMENTS:

From advertising description, this package looks to be an extremely sophisticated combination of data management and analysis capabilities. Professor Carl Bowser, Department of Geology and Geophysics, University of Wisconsin has been involved in testing the stat module and can provide more infor- mation on this program. Can be cumbersome. Uses up to 26 disks. Data may need to be scaled for ease of use. The bags may not yet have all been removed.

SOURCE OF INFO: Vendor publicity.

System Capabilities

DATABASE MODULES

Boot, Datasetup, Conversions
- Data manipulations and setup
- Data transformations
- File handling capabilities
- Data listings
- Formatting and datafile creation
- Data entry with graphics tablet

Workfile
(Data Storage Disk)

STATISTICS MODULES

Description
- Cross tabulation
- Contingency analysis
- Descriptive statistics
- 2-way comparisons
- Normality testing
- Nonparametric comparisons
- Range statistics

Regression
- Statistical matrices calculations
- Linear regression
- Non-linear regression
- Multiple regression
- Stepwise multiple regression
- Residual analysis for all regressions

ANOVA
- Single classification
- Nested classification
- 2 & 3 way with equal sample sizes
- 2 & 3 way with unequal sample sizes
- Kruskal-Wallis nonparametric

Time Series
- Moving averages and variances
- Multi-stage least squares
- Fitted polynomial and trig functions
- Forecasting an additive series
- Forecasting a multiplicative series
- Exponential forecasting

Multivar
- Principal components analysis
- Factor analysis
- Discriminant function analysis
- Canonical correlation
- Multiple contingency analysis
- Cluster analysis
- Matrix determinants and inverses

GRAPHICS MODULES

Graphedit
- Keyboard editing
- Paddle and joystick editing
- Graphics printing to selected printers
- Change character sets
- Graphics saved to diskette
- Automatic viewing of graphics diskette contents

Scatter
- Scatter plot
- Histogram
- Pie chart
- Triangle plot
- Ordered scatter plot
- Bivariate plot

Statplot
- Variance plot
- Range plot
- Normality plot
- Cost efficiency plot
- Function generator
- Contour plot
- Moving averages plot

Curvefit
- Linear regression plot
- Non-linear regression plot
- Residual plot (all regressions)
- Fitted polynomial plot
- Fitted trig function plot
- Box-Jenkins identification

Multiplot
- Multivariate scatter plot
- Cluster analysis dendogram
- Andrew's Fourier plot
- Star plot

Statpro Statistics

Statpro STATISTICS is the workstation component which provides you with an extensive collection of modern statistical procedures, many of which have been previously available only on large computers.

Whether your application involves scientific research, consulting, market research, forecasting, or demographic studies, you will find the appropriate statistical routines in *Statpro*. All *Statpro* STATISTICS procedures have been thoroughly tested for quality, accuracy, and speed of execution.

These procedures can be performed on the data stored in any *Statpro* workfile. By using the powerful data handling capabilities in the *Statpro* DATA-BASE, you can employ a procedure on various subsets of your data. Additionally, for quick analyses you can enter data directly from the keyboard.

Statistical procedures are detailed in the *Statpro Statistics User's Guide*, with instructions on how to run the program, examples of data input and output, and appropriate statistical references.

Statistical output may be saved and stored on the diskette, or listed out to a printer. The following pages illustrate the format of sample output from a variety of *Statpro* procedures.

The STATISTICS component of *Statpro* contains five sets of analyses grouped in the following modules:

Descriptive
• Cross tabulation
• Contingency analysis
• Descriptive statistics
• 2-way comparisons
• Normality testing
• Nonparametric comparisons
• Range statistics

1. Descriptive: Statistical Comparison Summary

```
Statistical  Comparison  Summary

Title --> HFS STEAM TARGET DATA

Date  -->

Record range [1-25]

Sorted fields - None

Field for X(I) --------------->          2
Field for Y(I) --------------->          4

Summary for Paired Comparisons

Number of observations ------>          25
Sum of X(I) ----------------->     136.060
Sum of Y(I) ----------------->     158.900
Mean of X(I) ---------------->     5.44240
Mean of Y(I) ---------------->     6.35600
Uncorrected SS for X(I) ----->     756.511
Uncorrected SS for Y(I) ----->     1083.81
Sum of cross products ------->     860.461
[Sum of X(I)] squared ------->     18512.3
[Sum of Y(I)] squared ------->     25249.2
Corrected SS for X(I) ------->     16.0181
Corrected SS for Y(I) ------->     73.8417
Corrected SS of X(I)&Y(I) --->    -4.33612
--------------------------------------------
Covariance of X and Y ------->    -0.18067
--------------------------------------------

--------------------------------------------
Correlation of X and Y ------>    -0.12608
--------------------------------------------

--------------------------------------------
R-Squared value of X and Y -->     0.01590
--------------------------------------------

Summary --> Unpaired Comparisons

Number of X observations ---->          25
Number of Y observations ---->          25
Sum of X(I) ----------------->     136.060
Sum of Y(I) ----------------->     158.900
Mean of X(I) ---------------->     5.44240
Mean of Y(I) ---------------->     6.35600
Uncorrected SS of X(I) ------>     756.511
Uncorrected SS of Y(I) ------>     1083.81
[Sum of X(I)] squared ------->     18512.3
[Sum of Y(I)] squared ------->     25249.2
Corrected SS of X(I) -------->     16.0181
Corrected SS of Y(I) -------->     73.8417
--------------------------------------------
Unpaired T-test value ------->    -2.36075
--------------------------------------------

--------------------------------------------
Numerator D.F. -------------->          24
Denominator D.F. ------------>          24
Numerator FIELD ------------->           4
```

Residuals and Predicteds

#	Obs. X	Obs. Y	Pred. Y	Residual	Smooths	95% Confidence Limits for Values		

Linear Regression Summary

Title --> COMPANY A TRAINING STUDY

Date ----------------> 03-04-15

Record range (1-1*)

Sorted fields   None

Control Information

Independent label --> Field 7:
Dependent label ----> QUALITY

Number of observations --------->	10
Degrees of freedom ------------->	9
Sum of cross products ---------->	831.281
% variation explained ---------->	64.2043
ST. Dev. as a % of mean response)	7.49071
Regression intercept ----------->	40.3968
Regression slope --------------->	0.63055
Functional intercept ----------->	30.4260
Functional slope --------------->	0.78693
Sum squares of (R(1)-R(1-1)) --->	763.363

Variable	Field #	Sums	Sums 2	Mean	St. Dev.
Independent	7	627.59	1218.35	65.76	
Dependent	7	806.(*)	816.40	80.60	
Residuals		0.(*)	292.235	0.00	4.(*)

Coefficients

	Coefficients	Variances	St. Errors
B0 -)	40.3968	116.294	10.7840
B1 -)	0.63055	0.0277	0.1665

Analysis of Variance Table

Source	DF	SSquare	MSquare	F-Test
Total(Corr)	9	816.40		
Regression	1	524.16	524.16	14.349
Residual	8	292.24	36.53	

Runs Test Summary

Residuals >= 0 --->	7	Residuals < 0 ---->	3
Number of runs --->	7	T-Statistic ---->	1.8021
Runs distribution ---------->	N (5.200 , 1.4933)		

Durbin-Watson Test Summary

Durbin Watson statistic (DW) ------------>   2.6122

REMINDER: Serial correlation = P
   and --> H0:P*S=0 ::: H1:P*S=P(S)

One sided test ------> P>=0 ------>	IF DW	<=DU
One sided test ------> P<=0 ------>	IF 4<DW	<=DU
Two sided test ------> P<>0 ------>	DW OR 4=DW <DU

Anova Summary

Title --> sugar beet

Sorted fields = none

Number of groups ------------>	18
Number of observations ------>	72
Total Mean ------------------>	30.9561
Total Variance -------------->	2840.3930

Group	Field	Low	High	Interval
1	1	1	4	1
2	2	1	4	1
3	3	1	4	1
4	4	1	4	1
5	5	1	4	1
6	6	1	4	1
7	7	1	4	1
8	8	1	4	1
9	9	1	4	1
10	10	1	4	1
11	11	1	4	1
12	12	1	4	1
13	13	1	4	1
14	14	1	4	1
15	15	1	4	1
16	16	1	4	1
17	17	1	4	1
18	18	1	4	1

Anova Table

Source of Variation	DF	SS	MS	F
Among Groups	17	2338.547	137.562	(4.796)
Within Groups	54	502.047	9.297	
Total	71	2840.594		

Exponential Smoothing Summary

Title --> Exponential Smoothing Test Data

Control Information

Record range (1-24)

Sorted fields - None

Number of observations ->	24
Period (field number --->	1
Forecast field number -->	2
Optimal alpha estimate ->	0.0200

Analysis assumes no trend

Forecasting equation
Forecast = 0.020y(t) + 0.980ST(t-1)

Sum of Squared Forecast Errors

Alpha Constant	Squared Errors
0.01	27906.6
0.02	27868.2
0.03	27874.8
0.04	27918.6
0.05	27992.8
0.06	28092.9
0.07	28214.4
0.08	28353.9
0.09	28508.6
0.10	28676.0
0.11	28854.4
0.12	29042.0
0.13	29237.5
0.14	29439.8
0.15	29648.0
0.16	29861.2
0.17	30078.8
0.18	30300.2

Simulation of Forecasting 1 Period Ahead

Period	Y(t)	S(t)	Forecast	Error	Squares

Initial estimates 359.670

1.00	362.000	359.717	359.670	2.330	5.429
2.00	381.000	360.142	359.717	21.283	452.982
3.00	317.000	359.279	360.142	-43.142	1861.26
4.00	297.000	358.054	359.279	-62.279	3878.73
5.00	299.000	358.951	358.054	40.966	1678.23
6.00	402.000	359.716	358.951	43.147	1861.65
7.00	375.000	360.022	359.716	15.284	233.597
8.00	349.000	359.801	360.022	-11.022	121.481
9.00	386.000	360.325	359.801	26.199	686.367
10.00	328.000	359.679	360.325	-32.325	1044.93
11.00	389.000	360.265	359.679	29.321	859.729
12.00	343.000	359.920	360.265	-17.265	298.090
13.00	274.000	358.243	359.920	-85.920	7642.56
14.00	334.000	357.757	358.243	-24.242	587.654
15.00	394.000	358.482	357.757	36.243	1313.57
16.00	334.000	357.992	358.482	-24.482	599.350
17.00	384.000	358.512	357.992	26.008	676.41a
18.00	314.000	357.622	358.512	-44.512	1981.33
19.00	344.000	357.350	357.622	-13.622	185.557
20.00	337.000	356.943	357.350	-20.350	414.103
21.00	345.000	356.704	356.943	-11.943	142.634
22.00	362.000	356.810	356.704	5.296	28.051
23.00	314.000	355.953	356.810	-42.810	1832.66
24.00	365.000	356.134	355.953	9.047	81.841

Regression
- Statistical matrices calculations
- Linear regression
- Non-linear regression
- Multiple regression
- Stepwise multiple regression
- Residual analysis for all regressions

Analysis of Variance
- Single classification
- Nested classification
- 2 & 3 way with equal sample sizes
- 2 & 3 way with unequal sample sizes
- Kruskal-Wallis nonparametric

Time Series
- Moving averages and variances
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- Fitted polynomial and trig functions
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2. *Regression: Linear Regression Summary*

3. *Analysis of variance: ANOVA Summary*

4. *Time Series: Exponential Smoothing Summary*

5. *Multivar: Oblique Primary- and Reference-Factor Analysis*

PROGRAM NAME: Stats Plus

DESCRIPTION: Menu driven, ranks data, restructures files,
                  cross-tabs (up to 5-way), file searches. Includes
                  plotting and printer reports. Designed to be interac-
                  tive with Human Systems Dynamics Series – ANOVA II,
                  HSD ANOVA, HSD STATS, and HSD REGRESS. Descriptive
                  Statistics, transforma- tions, partial correlation, 2
                  way ANOVA, a series of Statistical tests. Histograms
                  and plots.

HARDWARE: Apple II, 48K, 1 or 2 disk drives

LANGUAGE:

AVAILABILITY: Human Systems Dynamics
                  9010 Reseda Blvd., Suite 222
                  Northridge, California 91324
                  (213/993-8536)

PRICE: $200

COMMENTS: "Thoroughly tested against examples from textbooks,
                  SPSS, and B1OMED. 1-20 variables per file. Accepts
                  print format files from VISICALC and DIF files.

SOURCE OF INFO: February 1983 promotional material.

STATS PLUS

PROFESSIONAL STATISTICAL ANALYSIS WITH A RESEARCH DATA BASE

Stats Plus is easy to use. You don't have to memorize any commands, just follow conversational menus.

Stats Plus uses data from keyboard or disk. Design your own data base files for later analysis, or simply enter your data directly into the analysis routines.

Stats Plus creates disk files of your data which you can count, search, sort, review, edit, merge, join and divide.

Stats Plus generates reports on the data in your files.

Stats Plus produces high resolution scatterplots for regression data, bargraphs and polygons for frequency distributions.

Stats Plus is completely interactive with the other programs in the Human Systems Dynamics Series. You can use **Stats Plus** files with ANOVA II, HSD ANOVA, HSD STATS, and HSD REGRESS.

Stats Plus has been thoroughly tested against examples from textbooks, SPSS and BIOMED.

Stats Plus has the professional support of Human Systems Dynamics behind it. You can call or write for technical advice. Get any replacements for disks you damage at the nominal fee of $9.00. Purchase any major program revisions at substantial discounts.

For the Apple II, 48K, ROM Applesoft 1 or 2 Disk Drives, Optional Printer

Written and tested by professional research consultants, **Stats Plus** is the fifth program in the statistics series from Human Systems Dynamics. **Stats Plus** provides you with sophisticated statistical analysis and simplicity of use.
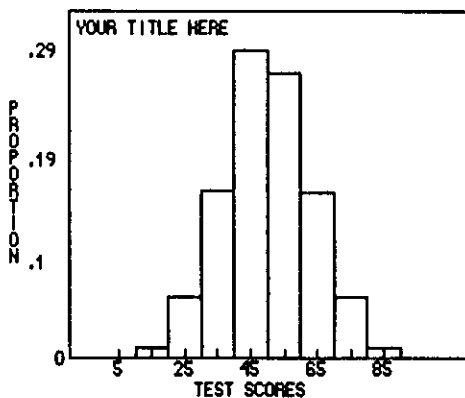
Stats Plus Accepts:

1 to 20 Variables per File
Keyboard or Disk File Data
Print Format Files from VISICALC

Stats Plus Performs:

Data Ranking
File Ranking
File Restructuring
1 to 5 Way Cross-tabulation
1 to 4 Way Data File Search
File and Subfile Creation

Stats Plus Calculates:

Descriptive Statistics
14 Data Transformations
Frequency Distribution
Cumulative Frequency and Percent
Percentiles
Correlation Matrix
Pearson r
Spearman Rho
Kendall Tau
Partial Correlation
1 or 2 Predictor Regression
1 or 2 Way Randomized Anova
t-Test for Independent Groups
t-Test for Correlated Groups
t-Test against Population Mean
Chi-Square
Fisher Exact Test
Mann-Whitney/Rank Sum Test
Signed Ranks Test
Kruskall-Wallis
Wilcoxon Signed Ranks
Friedman Anova by Ranks

Stats Plus Produces:

Printer Reports of Results
Printer Copies of Data
Plots and Bargraphs on CRT or Disk
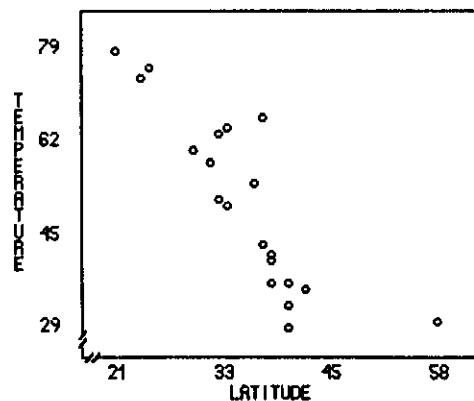
C. DESCRIPTIONS OF OTHER STATISTICAL AND RELATED SOFTWARE FOR SOCIOECONOMIC DATA ANALYSIS

1-2-3

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives		Lotus Development Corp.
	128K RAM		55 Wheeler Street
			Cambridge, MA 02138
			USA

This combines several functions in one Package. The spreadsheet permits 256 columns and 2048 rows (with 440K RAM), has date functions, financial functions, statistical functions (count, sum, average, max, min, variance, Std. dev), logical operators and a few special operators. It also has extensive screen and print formatting capabilities. The data base function (called Information Management) can handle multiple data bases each having up to 2000 records of 256 fields each. It appears to be an indexed system with a maximum of 2 key fields per record. It will sort, modify the data base, produce histograms of selected items, do spreadsheeting of 1 or 2 variables, select on the basis of 1-32 criteria and produce descriptive statistics. The graphics function produces X-Y plots, scatter graphs, line charts, pie charts, bar charts and stacked bar charts in black & white or color. It also features auto or manual scaling, labels and titles plus special symbols and four fonts. It will produce graphs on several common printers and plotters. In addition, standard ASCII data files may be read or written and converter routines are included for VisiCalc, dBase II and DIF files. Over 200 help screens make it nearly independent of a manual.

16K Finance System   US $20.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	K & K Software
	16K RAM		PO Box 6403
			Falls Church, Virginia
			USA

The 16K Finance System includes Trend Analysis, Annuities, IRA Accounts, Compound Interest and Annuity Due calculations in a menu-driven package.

Advanced Statistical Analysis   US $39.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	level II BASIC	Radio Shack
			P.O. Box 17400
			Fort Worth, TX 76102
			USA

This package will perform simple descriptive statistics plus frequency distribution, multiple linear regression, and time series analysis.

Analysis I   US $49.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM	BASIC	Galaxy
	Hires capacity		PO Box 22072
			San Diego, CA 92122
			USA

ANA 1 is a command driven package written for time series analysis of market and stock data. It includes various graphics options for graphical analysis of trend lines.

Reviews and vendor literature do not specify the form of data entry. Addition of data to an existing database is possible but only one input per day is permitted. The program is supplied with a database of the weekly Dow Jones Index from 1897 to date. Transformations which can be performed are least squares, linear fit, filters for time/magnitude/percentage changes and up to two user defined functions. The data plotting features include color line charts with 26 to 260 data points on a single graph. The scale is automatically calculated or it can be user specified. There is no limit on the number of overlays permitted on a graph. Some of the useful data handling functions are selection of a range of data to load from disk, moving average, best straight line fit, transformations and filters. Results may be displayed on the screen or printer. The data set used for a graph may also be displayed or printed.

Analysis of Variance   US $43.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 diskette		Dynacomp, Inc.
TRS-80 III	or 1 cassette		1427 Monroe Ave.
CP/M	16K RAM		Rochester, NY 14618
			USA

ANOVA is actually four programs in one. Each program performs a specific task matched to the designed experiment under analysis. (1) A one-way ANOVA produces the treatment sum of squre, mean square, and F ratio along with the error mean square. This algorithm accepts unequal numbers of replicates per treatment level and unlimited numbers of treatment levels and replicates. (2) Two-way ANOVA performs an analysis of either fixed or random factors with equal numbers of replicates per cell. There is no practical limit on the number of levels or replicates. Sums of squares and mean squares are printed for both factors and the interaction as well as the error sum of squares and all F ratios. (3) The "N-Way" (for N up to 5 factors) will accept up to 4 levels per factor or any combination of levels not to exceed 1024 treatment combinations in 16K of core. Sums of squares and mean squares for all main effects and up to 3 factor interactions are computed. The appropriate (residual or pure error) mean square is used to compute the F ratios. (4) YATES analysis computes the mean square and half effect for two level fractional experiments. All main effects and interactions are computed and printed out. In all programs except the YATES, the means for the main factors are printed.

ANOVA II   US $150.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	1 disk drive	Applesoft	Human Systems Dynamics
	48K RAM		9249 Reseda Boulevard
			Northridge, CA 91324
			USA

ANOVA II is a menu driven package using prompts and questions displayed on the monitor. Data entry may be done by case or by variable (row or column). Data may be stored in one single file or in several separate files for larger data sets. Data files are compatible with all other programs in the HSD series (ANOVA, STATS, and REGRESS). Analysis can be done on designs with 1-5 factors having up to 36 levels per factor. Types of experimental designs covered include randomized designs, repeated sampling design, and mixed designs plus designs with equal or unequal n. Data files can be edited, joined together, or transformed. Calculations and tests performed include ANOVA, analysis of covariance, F-Test, probabilities, mean, standard deviation, and sums of squares. Results may be displayed on a monitor, sent to a diskfile, or printed on a printer. Data plots and bar graphs may also be produced.

APLOT   Br St 380.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	APL Interpreter	CP/M 2.2	Alan Pearman
	64K RAM		Maple House
	daisy wheel		MortLake Crescent
			Chester CM3 5UR
			England

APLOT is a graphics package for daisy wheel printers. It will produce X-Y charts, and pie charts in black/white or colors. It can receive data from STAPL, MICROFIN or MDMS; all packages sold by the same company.

Apple Data Graph   US $400.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Conneticut Information
			218 Huntington
			Bridgeport, CT 06608
			USA

Apple Data Graph is written for drawing line charts and scatter charts. Data entry is by keyboard and the graphs can be saved on disk. Up to 120 points can be plotted on one line and up to 3 lines can be plotted on one chart. Three line types can be used. No mention is made of hardcopy facilities.

Apple III Business Graphics   US $175.00

Computer:	Hardware:	Op. System:	Vendor:
Apple III	1 disk drive	Pascal	Apple Computer, Inc.
	128K RAM		20525 Mariani Ave.
	plotter or prntr		Cupertino, CA 95014
			USA

This is a package that allows curve fitting and trend analysis, and plots line, pie and bar charts with overlays. Charts can be plotted in three different sizes, in different colors, with or without fill and with text being placed at any location on the chart. Data files can be edited and saved and information can be taken and plotted from VisiCalc files, DIF files, ApplePlot files and BASIC text files.

Apple Plot   US $70.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM		Apple Computer, Inc.
			10260 Bardley Drive
			Cuppertino, CA 95014
			USA

Apple Plot will produce bar, line, or scatter charts of data entered from the keyboard. There is a provision for data editing and colors. No information is available at this time about the equipment needed for printing graphs.

Apple Statistics   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM	Applesoft	Happ Electronics Inc.
	1 Disk Drive		4640 Island View
			Oshkosh, WI 54901
			USA

Data entry can be done by either variable name or case number and there are provisions for editing and corrections.   Existing data files may be used to add new variables, add or delete individual values, or to create new files with a subset of data. The tests and calculations performed are;   mean, standard deviation, standard error, coefficient of variation, frequency distribution, unpaired t-test, paired t-test, Mann-Whitney U test, Wilcoxon paired sample test, Chi-square test, linear regression, correlation, one way ANOVA, and Newman-Keuls test. All results may be printed.

Applied Statistics   US $55.95

Computer:	Hardware:	Op. System:	Vendor:
CP/M	1 DISK DRIVE	HDOS	Sunflower Software, Inc.
ZENITH	48K RAM	CP/M	13915 Midland Drive
HEATH		MBASIC	Shawnee, KS 66216
			USA

Applied Statistics is a menu-driven package of common statistical routines. Data entry is from keyboard and can be saved on disk. Tests and calculations include paired t-test, u-test, F/u/t probabilities, ANOVA (1 & 2 way) and regression. Histograms of the data can also be produced. Results can be sent to a video monitor or printer.

Autograf   US $195.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	1 disk drive	CP/M	Data Most
Apple II	64K RAM		8943 Fullbright Ave.
	DMP Plotter		Chatsworth, CA 91311
			USA

Autograf is a CP/M based Apple graphics program. Data can be edited and saved on disk or input from other programs. Types of charts produced include line charts, bar charts with overlays, pie charts, hi-low charts and scatter plots. Scaling is automatic and different colors or shadings can be chosen. Only the DMP series of plotters can be used for output.

BANOVA-I   US $4.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	level II BASIC	Dr. D. Kauffman
			2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

This is a program for a one way ANOVA output. Includes ANOVA, summary table, treatment effects, F test, means, standard deviation, n, and a data list.

BANOVA-2   US $4.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	level II BASIC	Dr. D. Kauffman
			2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

This is a two-way ANOVA program and will produce the following results: ANOVA, treatment main and interaction effects, F test, probability, row/column/cell means, standard deviation, and a list of data.

Bar Chart Creator   Br St 15.00

Computer:	Hardware:	Op. System:	Vendor:
ITT 2020	48K RAM	UCSD Pascal	Systematic International
			5th Floor Essex House
			Arevrydown
			Basildon, Essex SS16 5BT
			G. Britain

Bar Chart Creator can create histograms in color and store the graphs on disk. No other information is available at this time.

Bar Graph   Cn $25.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Sheridan College
	2040 disk drive		1430 Trafalgar Rd.
	CBM 2020 printr		Oakville, Ontario
			Canada

Bar Graph can plot up to 60 data sets in a vertical bar graph. Scaling can be manually set and title plus sub-heading entered.

Barchart Simulator   Br St 420.00

Computer:	Hardware:	Op. System:	Vendor:
PET	32K RAM	BASIC	Alphabet Company
			2 Whitefriars Way
			Sandwich
			Kent
			G. Britain CT 139 AD

Barchart Simulator will generate barcharts on a PET computer. No other information available.

Bargraph   US $3.00

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	Quest Research Associates
	2K RAM		P.O. Box 3073
			San Jose, CA 95156
			USA

Bargraph will create a vertical bar chart of up to 30 bars. No other information is available at this time.

Basic Statistical Package   US $225.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drives	PC DOS	Jack Strick & Assoc.
	64K RAM	BASIC	949 S. Southlake Drive
			Hollywood, Florida 33019
			USA

Functions include descriptive statistics, ANOVA and standard deviation.

Basic Statistics   Cn $23.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM		Total Computer Systems
			PO Box 335
			Ajax, Ontario L1S 3C5
			Canada

The tests and calculations performed include central tendency, Person product-moment correlation coefficient, Chi-square, t test, ANOVA, Z scores, standard scores, and a random number generator.

Basic Statistics   US $90.00

Computer:	Hardware:	Op. System:	Vendor:
North Star			Enercomp Co.
CP/M			PO Box 28014
			Lakewood, Colorado 80228
			USA

No detailed information available at this time.

Basic Statistics Package   Br St 15.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

The tests and calculations included in this package are mean, median, variance, standard deviation, skewness, kurtosis, frequency distribution, linear regression, correlation,and t- test.

Basic Statistics Package II   Br St 15.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

This package includes paired t test, unpaired t test, linear regression, Mann-Whitney, Wilcoxon, and Spearman tests.

Bestline and Least Squares   Br St 10.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

This program uses the least squares method to fit a curve to a data set.

Biz-vu   US $29.95

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Jack Strick & Assoc.
	64K RAM	BASIC	949 S. Southlake Drive
	RatTRAX		Hollywood, FL 33019
			USA

Biz-VU will produce pie charts and bar charts on a printer. No other information available at this time.

BMDP   US $1000

Computer:	Hardware:	Op. System:	Vendor:
Statcat		UNIX	BMDP Statistical Software
			Suite 202
			1964 Westwood Blvd.
			Los Angeles, CA 90025
			USA

No other information is available at this time.

Box-Jenkins Forecasting Model   US $99.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 II	1 disk drive	TRS II DOS	Applied Economic Analysis
	32K RAM		4005 Locust Avenue
			Long Beach, Calif. 90807
			USA

Box-Jenkins Forecasting Model combines moving averages and auto-correlation in a trend analysis package. Analysis may be done automatically or the user can manually set the parameters used.

Busi-Graph   US $125.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	GraphTrax	PC DOS	Transaction Systems
	Epson printer		8708 E. 39th Street
			Tulsa, Oklahoma 74145
			USA

This uses the IBM PC medium resolution color graphics and an Epson printer with Graph-Trax to plot as many as 9 sets of data with automatic scaling, multiple plots in pie

charts, bar charts, line plots, area plots, multiple bars, scatter plots, high-low- close plots, perspective bar and stacked plots. It will also accept data files from VisiCalc via the DIF feature.

Business Graphics   US $175.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	64-128K RAM		Business & Prof. Software, Inc.
Apple II	2 disk drives		143 Binney Street Cambridge, Mass. 02142 USA

This is a command language graphics system with some data handling functions. It will perform vertical and horizontal bar charts, stacked bar charts, line charts, pie charts, area charts and scatter plots with horizontal and vertical title plus labels where desired. As many as 3821 data points (up to disk capacity) can be entered by keyboard, DIF files, VisiCalc print files, ASCII files and PASCAL files. In addition to descriptive statistics it will perform curve fitting to linear, constant, log, parabolic or sine equations. By use of a separate Printer/Plotter Installation Kit an impressive number of plotters, dot matrix printer and daisy wheel printers can be connected to provide hardcopy graphics. The commands may be abbreviated or grouped together and stored in files. The entire package may also be accessed as a subroutine to other programs. The range of graphics and interfacing is impressive. If there were just some way to get those commands into a menu so us common folk could use it.

Business Graphics Package   US $145.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	spec. interface	Applesoft	Strobe, Inc.
CP/M		MBASIC	897-5A Independence Ave. Mountain View, CA 94043 USA

Business Graphics Package is a menu-driven plotting package for the Strobe 100 Graphics Plotter. Data entry can be by keyboard, disk files or DIF files. Stored data can be edited before plotting. Types of charts produced include line charts, bar charts, pie charts and letter charts. Size, orientation and shading can be varied. Colors can be plotted by changing pens. Results can be produced on an Apple II video monitor or the Strobe 100 Graphics Plotter. Special interfaces are required for different computers using Parallel or Serial ports.

Business Graphics System   US $475.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	1 disk drive	CP/M	Peachtree Software
	64K RAM	MS DOS/PGL	3445 Peachtree Rd, N.E.
	Serial port		Atlanta, Georgia 30326 USA

Business Graphics System is a menu-driven graphics package for CP/M based computers. Data entry can be by keyboard or from Peachcalc spreadsheet files. Types of graphs produced include bar charts, pie charts, line charts and text charts. Bar charts can be vertical or horizontal, variable shading, 2 or 3 dimensional, grouped, vertical

overlays and can have variable width. Pie charts feature variable sizes, slice color, slice shading, displaced sections, and labels. Line charts feature optional grids, manual scaling, and variable filling. Text charts feature seven different fonts, and variable letter size/color/spacing/slant/angle/rotation. Text can also be manually entered on charts. Multiple charts can be created on a single screen. Charts can be produced on Epson MX series printers, HP series plotters, DMP series plotters and the Strobe 100 plotter.

Business Graphics-Analysis Pak   US $174.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 III	2 disk drives		Tandy Corp.
	48K RAM		One Tandy Center
			Fort Worth, TX 76102
			USA

Business Graphics-Analysis Pak is a menu-driven graphics package with some trend analysis functions. Data can be entered by keyboard or disk files. Disk data files can be used from Visicalc, Scripsit (ASCII), BASIC or FORTRAN sources. Types of graphs produced include line charts, vertical bar charts, pie charts and scatter plots. Line charts can have up to 100 data points with or without a connecting line. Bar charts can have up to 100 bars with 3 overlays or clusters of 3 bars with or without shading. Pie charts can have up to 12 slices with or without shading. Scaling may be manual or automatic. Labels and titles can be entered and text can be manually entered anywhere on the graph. Various line types and data point characters can be used. Size of the chart can be varied. Data manipulations include arithmetic and geometric series, moving averages, log transform, and linear/quadratic/exponential trend curves. Charts and data can be stored on disk. Results can be produced on a monitor, TRS-80 dot matrix printer, TRS-80 daisy-wheel printer or TRS-80 pen plotter.

Business Management III   US $110.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 II	56K RAM	CP/M	Century Software
Apple			Suite 1730
CP/M			1875 Century Park East
HP series			Los Angeles, CA 90067
			USA

Business Management III is a menu-driven statistical package for business applications. Data entry is from the keyboard or disk file and can accept up to 250 observations. The data management module permits editing, transformations, generation of subsets and addition of new files. The linear regression module calculates linear, exponential and power regressions. The colinear analysis module gives the best fit linear regression line. The multiple regression module can analyze up to 8 variables and will calculate residuals, plot the results, give t-values, ANOVA, F ratio, Durbin-Watson d-statistic and covariance matrix. The statistical analysis module gives descriptive statistics and a histogram.

Business Management VII   US $100.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 II	56K RAM	CP/M	Century Software
Apple			Suite 1730
CP/M			1875 Century Park East
HP series			Los Angeles, CA 90067
			USA

No further information available at this time.

Business Planning Package   US $99.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 II	1 disk drive	TRS II DOS	Applied Economic Analysis
	32K RAM		4005 Locust Avenue
			Long Beach, Calif. 90807
			USA

There are three modules in the package: short term forecasting, multiple regression, and seasonal adjustment. The data entry program permits data entry, deletion and modification. The short term forecasting module uses exponential smoothing. The multiple regression module includes tranformations and subset selection. The graphics output permits up to 5 data sets to be plotted on the same graph.

Business Stat & Marketing   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
PC-1			Radio Shack
			PO Box 17400
			Fort Worth, Texas 76102
			USA

This is a package of 7 programs: forecasting, seasonal variation, moving average, normal/t/F distributions, descriptive statistics, multiple regression, and Gomperts curve analysis.

Calculator I   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	Level II BASIC	Semi-Sentient Software
			Box 683
			New York, N.Y. 10001
			USA

Tests and calculations performed include regression, correlation, variance, mean, transformations, percent calculations, and factorial calculations.

Chart Pro   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Micro Control Systems
	128K RAM	disk BASIC	143 Tunnel Road
	Epson MX-80		Vernon, CT 06066
			USA

Data is input from the keyboard or from DIF files. This is a menu driven program and can plot grouped vertical bar charts, grouped horizontal bar charts and scatter charts with optional automatic scaling. It will work on a minimum configuration IBM PC having only a monochrome monitor, MX-80 (with or without GRAPHTRAX) and 128K RAM.

Chart-Master   US $375.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Decision Resources
Apple II	64-128K RAM	Applesoft	PO Box 309
Apple III	Var. plotters		Westport, CT 06880
			USA

Chart-Master will produce bar, pie, line, area and scatter charts. Data entry is by keyboard or directly from Visicalc files. Up to 600 data points can be entered, edited and saved. Missing values are permitted. Bar charts can have up to 600 bars and 24 clusters of bars, 8 shading patterns and horizontal or vertical orientation. Overlays are possible. Pie charts can have 20 slices, displaced sections, proportionally sized sections and a maximum of 4 pie charts on one screen. Line charts can have up to 24 lines, 8 different line types, horizontal or vertical orientation and cumulative lines. Area charts have specifications similar to line charts plus a choice of 8 colors for shading. Scatter plots are similar to the line plots without connecting lines. Curves can also be plotted using linear, exponential, log, power and moving average calculations. All charts can be produced in any size at any position and rotation desired. Titles and labels can be entered automatically or manually. Manual text entry permits a choice of 8 fonts, 16 sizes, underlining and colors. Charts can be made with grid lines and linear or log Y axis scale. Charts can be produced on a video monitor or the folowing plotters: IBM XY-750, Panasonic VP6801-A30, and HP 7221, 7220, 7225, 7470A. Some require special connector cables.

Chartman   US $380.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC			Graphic Software
			PO Box 367
			Kenmore Station
			Boston, Mass. 02215
			USA

Chartman is a graphic program that utilizes printers or plotters for the printout. It can save graphs on disk and interface with visicalc and features 2 and 3 dimentional graphs in colors in over 15 types of charts. Chartman is actually divided into three products or versions. Chartman I (US$380) will form up to 20 different types and variations of pie charts, line charts, and bar charts. These can be printed, plotted,or presented on the monitor in a series of charts similar to a slide show. Chartman II (US

$425) has all the features of Chartman I plus color display and interfacing with IBM XY-750 plotters and IDS color prism printers. Chartman III (US $99) has the same basic features as Chartman II but with less variety of chart types and only features a B/W monitor display. All three types will read and write DIF files. Operation is menu-driven. Data and labels are entered by "filling in the blanks" on a screen form. After data entry and editing a chart is shown on the screen. At this point it may be saved on a disk file, printed or plotted, or the basic information edited to correct mistakes. A maximum of 6 shadings and 8 colors can be used for pie and bar charts. Exploded pie charts can have 3 title lines of 48 charatcers each in any of 3 character sizes. Titles are automatically centered. As many as 3 footnote lines of 48 characters each may be added but these are produced only in the smallest character size. Overlays are not possible but Chartman II offers a few pie-bar chart combinations and multiple line plots. All three versions support the Epson MX-80/100 printers and HP-7470 and HP-7220 plotters. Limits for graph types are: Pie chart-20 slices, line charts-6 lines, bar charts, 72 bars, clustered bars-36 clusters.

Complete Graphics System II   US $69.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II		Applesoft	Co-op Software
			PO Box 432
			West Chicago, IL 60185
			USA

No additional information available at this time.

Context   US $695.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives	PC DOS	Context Management Systems
	256K RAM		23864 Hawthorne Blvd.
	color board		Torrance, CA 90505
			USA

Context is a software package which integrates a database manager, spreadsheet, word processor and graphics into one package. Types of graphs produced include vertical bar charts, grouped bar charts, scatter plots, line charts and filled line (area) charts. Bar and line charts can be overlaid. Different shadings are optional and fixed position labels can be entered. Data is taken from the database file. Graphics screen dump is produced on an Epson MX series printer with Graftrax.

CURFIT   Br St 4.80

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		OPTELCO
			26 Albany Road
			Rayleigh
			Essex SS6 8TE
			G. Britain

Fits six different types of curves to the data you enter by least squares methods.

Curve Fit   US $16.45

Computer:	Hardware:	Op. System:	Vendor:
Apple II	16K	Applesoft	Progressive Software
PET			Suite 323 Blue Bell West
			Blue Bell, PA 19422
			USA

No further information available at this time.

Curve Fit   Br St7.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15 3ES
			G. Britain

No further information available at this time.

Curve Fitter   US $34.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	BASIC	Creative Computing
			Software
	48K RAM		39 E. Hanover Ave.
			Morris Plains, NJ 07950
			USA

Curve II   US $275.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	B&L DMP Plotter	BASIC	West Coast Consultants
			1775 Lincoln Blvd.
			Tracy CA 95376
			USA

Curve II features horizontal or vertical bar charts, pie charts, line charts and equation plots. Data entry is by keyboard or from disk file. Bar charts can have variable shading and colors plus overlays. Pie charts can have different colors, shading and displaced sections. Line charts feature grid lines, linear or log error limit bars, and different line types. Equation plots can be cartesian (Y=F(X)), parametric (Y=g(t)) or polar (R=F(S)). Titles and labels can be automatically or manually placed on the charts. Text can be either normal or bold font. Charts can be produced on a video monitor or a Bausch & Lomb DMP plotter.

Curve Program   US $199.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 III	32-48K RAM	BASIC	West Coast Consultants
Atari			1775 Lincoln Boulevard
PET			Tracey, CA 95376
			USA

Curve Program will plot equations and bar charts using linear or log scales. Charts can be produced on Watanabe Digiplot or Houston Instruments Hiplot DMP plotters. No other information available at this time.

Daisywheel Plotting Software

Computer:	Hardware:	Op. System:	Vendor:
CP/M	2 disk drives	CP/M 1.4	Escape Computer Software
Zenith	48K RAM	CP/M 2.2	PO Box 1771
Heath			Roswell, GA 30075
			USA

No other information available at this time.

Data Plot   US $59.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	2 disk drives	Applesoft	Muse Software
	48K RAM	tDOS 3.2/3.3	347 N. Charles Street
			Baltimore, MD 21201
			USA

Data Plot will produce pie charts, line charts, and vertical bar charts. Multiple plots of bar and line charts are permitted and up to 4 charts can be produced on one screen. Graphics can be printed or saved on disk.

Data Reporter   US $220.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Applesoft	Synergistic Software
	48K RAM	DOS 3.3	830 N. Riverside Dr.
			Renton, WA 98055
			USA

Data Reporter is a database management package with graphics and report generator features. The graphics section will produce line charts, scatter plots, bar charts and pie charts. Multiple charts (overlay) can also be done. Data is input from any numeric field from the database files. Descriptive statistics can be calculated and standard deviation lines plotted on line charts and scatter plots. Labeling can be automatic or manual. Charts may be saved on disk or printed.

Data Smoother   US $23.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM		Dynacomp, Inc.
Heath			1427 Monroe Ave.
Delta			Rochester, NY 14618
CP/M			USA

The least squares method is used to smooth and plot the curve for equally spaced data points. The smoothing is done by averaging 3 to 25 points surrounding each data point. First to 5th degree polynomials may be used. First and second derivatives are calculated at each point. The number of data points permitted depends on the RAM available. Automatic scaling is provided for printouts.

Data-Graph   US $49.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	Silentype print		Hayden Book Co., Inc.
			50 Essex Street
			Rochelle Park, NJ 07662
			USA

Data entry is by keyboard.   Graphs can be produced on a video monitor or a SilenType printer.   No other information available at this time.

DATA-X   Br St 350.00

Computer:	Hardware:	Op. System:	Vendor:
PET		BASIC	Patrick Royston
			85 Cranfield Gardens
			London NW6 3EA
			G. Britain

Functions include   non-parametric statistical   analysis,   ANOVA, regression, descriptive statistics plus data editing features.

Dataplot

Computer:	Hardware:	Op. System:	Vendor:
Zenith	1 disk Drive	HDOS	Reichert Digital Systems
Heath	48K RAM	CP/M	29 Blazier Rd.
CP/M			Warren, NJ 07060
			USA

Dataplot will produce both X-Y charts and bar charts. Up to 500 X-Y data points and 60 bars can be plotted. Linear and log scales can be used and autommatic or manual scale selection is included.

Datagraph Statistical Display Sys.   US $24.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	4-32K RAM	level I BASIC	Datagraphics
TRS-80 II	1 disk drive		PO Box 566
			Union Station
			Endicott, NY 13760
			USA

Datagraph is also available for TRS-80 model II ($49.95) on disk and paper listing ($39.95). No other information available at this time.

Dataplot

Computer:	Hardware:	Op. System:	Vendor:
CP/M	1 disk drive	HDOS	Reichert Digital Systems
Zenith	48K RAM	CP/M	29 Blazier Road
Heath			Warren, NJ 07060
			USA

Dataplot will produce both X-Y charts and bar charts. Up to 500 X-Y data points and 60 bars can be plotted. Linear and log scales can be used and automatic or manual scale selection is included.

Descriptive Statistics AP-7 Comp   US $60.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM		Compress: Div. of Sci. BKS
			PO Box 102
			Wentworth, NH 03282
			USA

No further information available at this time.

Descriptive Stats & Reg. Analysis

Computer:	Hardware:	Op. System:	Vendor:
			Advanced Operating
			Systems
			460 St. John Road
			Michigan City, IN 46360
			USA

Descriptive Statistics and Regression Analysis will calculate standard deviation, kurtosis, 2 score, variance, curvilinear regression, and multiple linear regression.

Draftsman   US $200.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives	PC DOS	Starware
	128K RAM		Suite 801
	color board		1701 K Street, NW
			Washington, D.C.
			USA

Draftsman will accept data from the keyboard, ASCII files or DIF files. Types of charts produced include pie charts with displaced sections, horizontal or vertical bar charts either stacked (overlaid or grouped), scatter plots, and line charts. Overlays and multiple charts can be produced on one screen. A screen editor allows editing of a finished chart. Charts can be linked together in a slide-show format or printed to an Epson MX80, IDS Prism or HP7470 plotter. The manual is included on the program disk.

ELF/ARIMA   US $400.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	48K RAM	CP/M 2.2	Winchendon Group
Atari	floating point		PO Box 10114
			Alexandria, Virginia 22310
			USA

Exploratory Data Analysis   US $150.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM		CONDUIT
	1 disk drive		PO Box 338
			Iowa City, IA 52244
			USA

This package includes the textbook "Applications, Basics, and Computing of Exploratory Data Analysis" plus twelve BASIC or FORTRAN programs on disk. In addition to the data entry/edit programs the following analytical methods are included: stem and leaf displays, letter value displays, boxplots, X-Y plots, resistance lines, data smoothing, coded table display, median polish, and rootograms. The textbook serves as both an instructional guide and manual for use of these programs.

Factor Analysis   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 III	1 disk drive	MS DOS	R. R. Belanger
IBM PC	48K RAM	TRS DOS	541 W. Sixth St.
CP/M		Applesoft	Azusa, CA 91702
Apple II			USA

Factor Analysis is a package of fourteen menu-driven programs. Data entry is from the keyboard and data can be edited, transformed or stored on disk. Up to 60 variables and 40 factors can be analyzed. There is no limit on the number of observations. Two methods of factor analysis can be used: Varimax and orthogonal powered-vector. Results and calculations include principle components, varimax single structure, orthogonal powered-vector simple structure, weighted cross-factor simple structure and oblique reference structure. When appropriate latent roots and communalities are also produced. Results can be produced on the video monitor or printer.

Factor Analysis   US $99.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II		Applesoft	Mathematical Software
			Box 12349
			El Cajon, CA 92022
			USA

Factor Analysis is a single function package for factor analysis. Up to 35 variables for 100 cases can be analyzed. Data can be entered as raw data, as a correlation matrix or as factor loadings. Both data entry and analysis can be stopped and continued at a later time. The controid method is used. There is no provision for interfacing with other programs.

Farm Soft Linear Programming   US $125.00

Computer:	Hardware:	Op. System:	Vendor:
	48K RAM	Applesoft	Decision Data, Inc.
	2 disk drives		213 Lincoln Way
			Ames, IA 50010
			USA

Farm Soft LP includes examples of 10 different LP applications for the farm. It can accept up to 50 variables and 50 linear constraints.

FARMAP   free

Computer:	Hardware:	Op. System:	Vendor:
CP/M	2 disk drives	CP/M	John Dixon
	64K RAM	Fortran IV	Farm Mgmt. & Prod.
			Econ. Serv.
	PLINK II		AGS Division
			FAO, ROME
			Italy

FARMAP is primarily a survey analysis package with certain codes, classifications, and tabulations pre-programed. Data entry may be on 80 column cards or by keyboard. All data can be checked for non-valid values as well as acceptable combinations of values. Tables which can be automatically prduced are: Family composition (total, workers, ages, sex, education), Land use/crop pattern (farm area, land use, ownership, crop area, crop variety by field), Livestock (number, turnoff %, mortality %, weights, birth rate, replacement rate, female/male ratio), Economics (income, material inputs, gross margin, cash flow), net month statement (inventory, changes), monthly cash flow, and farm power. Cross tabulations may be done for all farmers combined, each farmer, each enterprise, or each field. Additional screen editing software is needed such as wordstar in order to use the package. A hard disk drive is also recommeneded. Documentation includes a 400 page users manual and a 100 page programmers manual. The data files can be interfaced with other statistical packages such as Microstat or SPSS. This package is also available in formats for minicomputers.

Fast Graphs   US $299.95

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives	PC DOS	Innovative Software, Inc.
	64K RAM		Suite 380
	color monitor		9300 West 110th Street
			Overland Park, KS 66210
			USA

Fast Graphs is a menu-driven graphics package for the IBM PC. Data entry may be by keyboard, DIF files or from T.I.M. data files (a database package). Data can include decimals and negative values. Types of graphs produced include line charts, scatter plots, pie charts, bar charts and a free form drawing mode. Line charts include filling and up to 6 lines on one charts. Scatter plots feature variable symbol selection. Pie charts can have up to 12 slices, displaced sections, and shading or colors. Bar charts can be horizontal or vertical, 3 dimensional, clustered, vertically stacked and have up to 72 bars. A draw mode permits entry of text on a chart plus the creation of specialized drawings such as maps or plans. Charts can be produced on a color monitor, dot matrix printers or plotters.

Financial Modelling

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	64K RAM	PC DOS	American Business Systems
	1 hard disk	CP/M-86	3 Littleton Road
	132 col printer	UNIX	Westford, Mass. 01886
			USA

Financial Modelling will calculate projections and trends, depreciation schedules, inflation, and constant calculations in a row/column arrangement.

Forcast   US $9.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	UAS
	1K RAM		P.O. Box 612
			Haddonfield, NJ 08033
			USA

Forcast will calculate three trend lines (straight line, smoothed and exponential) with the standard error for each.

Forecast   Br St 10.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM	N ACT Microsoft	Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham
			Gr. Britain B15-3ES

This program will compute the logarithmic trend based on a maximum of 35 data points and will plot a histogram.

Forecaster II   US $29.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	16K RAM	Applesoft	System Design Lab
	Applesoft ROM		Suite B
			2612 Artesia Boulevard
			Redondo Beach, CA 90278
			USA

Forecaster II will perform linear regression and produce hi-res graphs of the trend line. No other information available at this time.

Forecasting Group

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Inst. of Industrial
			Engineers
			25 Technology
			Park/Atlanta
			Norcross, GA 30092
			USA

Forecasting Group features four modules: Winter's model for forecasting, exponential smoothing, multiple regression and determination of smoothing factors. Winters model includes trends and seasonal adjustments for quarterly or monthly data with the option of entering smoothing factors. The exponential smoothing module allows single, double or triple smoothing with user specified weighting factors. Multiple regression is the standard procedure. The last module assists in calculating smoothing factors when given a set of data.

Future   US $59.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive		Decision Science Software
TRS-80 III	32K RAM		PO Box 7876
			Austin, Texas 78712
			USA

Future is a trend analysis package. Data entry may be from the keyboard or disk file. Data files can be updated or edited. Up to 100 data points can be entered. Functions include averaging, regression, seasonal adjustments, moving average and exponential smoothing. Results include correlation coefficients, confidence limits and a plot of the data.

GASP   Br St 500.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		Fortran	Wootton, Jeffreys, &
			Partners
			Cemetery Pales
			Brookwood, Woking
			Surrey
			G. Britain

No further information available at this time.

General Stat Application Pac   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
HP83			Hewlett-Packard
HP 85			3400 E. Harmony Rd.
			Ft. Collins, CO 80526
			USA

General Stat Applications Pac will calculate paired sample analyses, distributions, and multiple linear regression.

Grafiks   US $125.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CBASIC	Robonics
Osborne			901 Manhattan Ave.
			Hermosa Beach, CA 90254
			USA

Grafiks is a menu-driven graphics package. Data entry can be by keyboard, CBASIC files or Supercalc files. Data can include decimals and negative values. Types of graphs produced include scatter plots, pie charts, bar charts and equation plotting. Scatter plots can have overlays with a choice of point symbols. Pie charts can be generated as percentages or with absolute values. Bar charts can be clustered. Because Grafiks has been written for the Osborne I the resolution of the screen display and printout are not as good as other computers. A screen editor permits additions of text or block graphics characters on a finished graph. Charts can be produced on a video monitor or Epson, Okidata, NEC, C. Itah and IDS dot matrix printers.

Graftalk

Computer:	Hardware:	Op. System:	Vendor:
CP/M	2 disk drives	CP/M	Lifeboat Associates
	140K disk		1651 Third Avenue
			New York, NY 10028
			USA

Graftalk is a command driven graphics package for CP/M based computers. Data can be entered by keyboard, or ASCII disk files. Decimals can be entered as data. Types of graphs produced include line charts, vertical and horizontal bar charts, and pie charts. Bar charts can be produced with shading, color, clusters and negative values. Line charts can have different line types, colors, overlays and automatic Y axis scaling. Pie charts can have different shading, colors and displaced sections. Text and symbols can be added to these charts as desired in addition to standard titles and labels. Overlays permit bar, line and text charts to be done on the same axes and pie charts to be done on the same chart. Text additions can have adjustable size and rotation. The vendor claims that various printers and plotters can be used for paper copies.

Graph

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM	APDOS	Software Pub. Corp.
			2021 Landings Dr.
			Mountain View, CA 94043
			USA

No further information avaiable at this time.

Graph Creator   Br St 15.00

Computer:	Hardware:	Op. System:	Vendor:
ITT 2020	48K RAM	UCSD Pascal	Systematic International
			5th Floor Essex House
			Arevrydown
			Basildon, Essex SS16 5BT
			G. Britain

Graph Creator will produce X-Y charts in colors with up to 5 overlays. Charts can be saved on disk. No other information available at this time.

Graph Fit   US $25.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Microware
			P.O. Box 113
			Pompton Plains, NJ 07444
			USA

Graph Fit will produce pie, bar and line charts with automatic scaling. No other information available at this time.

Graph It   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
Atari	16K RAM	BASIC	Atari, Inc.
	1 cassette		1265 Borregas Avenue
	BASIC cort.		Sunnyvale, CA 94086
			USA

Graph It is a menu-driven screen display graphics system. Types of charts produced include bar charts, pie charts and X-Y plots. Bar charts can have up to 10 bars and 2 overlays with different colors and automatic scaling. Pie charts can have up to 12 slices and three colors. Functions can be plotted on an X-Y plot with automatic scaling, different plot speeds and 3 overlays. There is no provision for a printer or plotter output.

Graph Pak   US $270.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	plotter	CP/M + FORTRAN	Laboratory Computer
			System, Inc.
			139 Main Street
			Cambridge, MA 02142
			USA

No other information available at this time.

Graph Plot

Computer:	Hardware:	Op. System:	Vendor:
Zenith	48K RAM	HDOS	Keyboard Studio
Heath	1 disk drive		125 Aspen
			Birmingham, MI 48009
			USA

No other information available at this time.

Graph Plotter   US $7.00

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	Omega Enterprises
			P.O. Box 1802
			Independence, MO 64055
			USA

Data from up to 3 files can be plotted on one screen. No other information available at this time.

Graph Plotter   Br St 30.00

Computer:	Hardware:	Op. System:	Vendor:
Vid. Genie	32K RAM	Molimerx Ltd.	
			1 Buckhurst Road
			Town Hall Square
			Bexhill-on-Sea, E. Sussex
			G. Britain

Data can be displayed as either bar charts or line charts. Descriptive statistics are also calculated (mean, standard deviations, median, mode). Data entry may be by keyboard or from data file. The maximum number of value permitted depending on the amount of memory available (16K, 32K, or 48K RAM). Data can be edited. Names or labels can also be entered.

Graph Power   US $295.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	UCSD p-System	Ferox Microsystems
	Hi Res. color	UCSP Pascal	6th Floor
	128K RAM		1701 N. Fort Myer Drive
			Arlington, VA 22209
			USA

Graph Power will input data from the keyboard or the Micro-DSS/Finance package. It can produce camera ready bar, line or pie charts plus text in 8 letter sizes and 5 slants. Features include automatic scaling, overlays, shading, math functions and interfaces to HP pen plotters or Houston Instrument Plotters.

Graph'n'Calc   US $249.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Desktop Computer
			Software
Apple II	64K RAM		Suite 29-303
	color graphics		303 Potrero Street
			Santa Cruz, CA 95060
			USA

Graph'n'Calc is a menu- driven package which includes functions for graphics, trend analysis, regression and data editing. Data is organized in rows and columns and entry may be from the keyboard, DIF files or ASCII files. The data editing facility permits arithmetic operations on entire rows plus transformations. The regression module includes descriptive statistics, comparative analysis and multiple linear regression. The trend analysis functions include calculations and adjustment with seasonal factors, exponential smoothing and growth calculations. The graphics functions will generate line charts with up to 2 overlays, bar charts with up to 3 bars in each group, bar charts with up to 4 overlays, high-low-close-volume charts and pie charts. All charts can be in color or B/W and can be joined in a slide show format or printed via screen dump.

Graphic Package   Br St 12.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15 3ES
			G. Britain

Graphic Package permits equation plotting and bar chart production.   No other information available at this time.

Graphics Generator   US $195.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	64K RAM	Advanced BASIC	Robert J. Brady Co.
	Graftrax		Prentice Hall Co.
	Graphics board		Bowie, Maryland 20715
			USA

The Graphics Generator is a command-driven graphics package for the IBM PC. Data can be entered by keyboard, Visicalc files or "other" data files (presumably DIF files). Types of graphs produced include bar charts, pie charts, and line charts. Up to 10 line charts can be overlaid or 2 bar charts merged into one. Some color coding is available for bar and pie charts. Automatic scaling is standard and title placement is fixed. Line functions can also be graphed. All charts can be stored on disk, printed on the Epson MX80 with Graftrax or chained together for a 'slide show' on the monitor.

Graphics Presentation Pac   US $250.00

Computer:	Hardware:	Op. System:	Vendor:
HP-87			Hewlett-Packard
			Personal Computer Div.
			Corvallis, OR 97330
			USA

Types of charts produced inlcude pie, bar, line and text charts. Charts can be produced on a HP 7470A plotter. No other information available at this time.

Graphit

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive		Molimerx Ltd.
TRS-80 III			1 Buckhurst Road
			Town Hall Square
			Bexhill-on-Sea, E. Sussex
			G. Britain

Graphit is a menu and command-driven graphics package. Data entry is by keyboard or DIF files. Data can include decimals and negative values. Up to 50 pairs of data can be entered. Types of charts produced include line charts and bar charts. Charts can be produced on a video monitor or dot matrix printer.

Graphkit   Br St 80.00

Computer:	Hardware:	Op. System:	Vendor:
PET	32K RAM		Telpac
Apple II	1 disk drive		Cranfield
			Bedford MK43 OAJ
			G. Britain

Graphkit is a menu-driven program for fitting a curve to a set of data. Data entry can be from the keyboard or disk file and includes checking and editing. A best fit curve can be automatically calculated or various types of curves tested. The types of curve which can be calcuated are: straight line, log X versus y, x versus log y, log x versus log y, and polynomials (up to 9th order). The curves can be plotted on log or various straight line scales. Statistics calculated include correlation coefficient, t value, error of estimate and residuals. Results may also be printed.

GUYL Statpak   US $179.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CPM	Micro/Research
		MBASIC	PO Box 70
			Forest Ranch, CA 95942
			USA

GUYL Statpak is supplied in the MBASIC source code which permits modification and backup of the package. Types of tests and calculations include six types of ANOVA, heterogeneity of variance, probabilities, descriptive statistics, Newman-Keuls, Scheffe analysis, source-main effect interactions, Mann-Whitney U-test, rank ANOVA, Chi

square, Z test, Spearman rank correlation, Pearson product-moment correlation, discriminant function analysis, multiple regression, Thurstone Case IV scale analysis, bar graphs and histograms.

HAC LP   Free

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Applesoft	Computer Center
	48K RAM		Hawkesbury Agric.
			College
			Richmond, NSW 2753
			Australia

HAC LP comes from Hawkesbury Agricultural College in New South Wales, Australia. It is a menu-driven program for general linear programming applications. With 48K RAM a 35X35 matrix can be processed although up to 90 minutes may be needed for the calculations. Data can be edited, deleted or added for different runs. Sensitivity analysis is included. The 40 page manual (Occasional Paper No. 1/82 January, 1982) includes a flow chart for LP problem solving, a sample problem plus results and a program listing. The disk containing HAC LP also has several sample problems but the price for the disk form was not given.

HAL3001   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Keller Software
	64K RAM		1825 Westcliff Drive
			Newport Beach, CA 92660
			USA

HAL3001 is a menu-driven statistical package for the IBM PC. Data entry is by keyboard or disk files with the DIF interface also being supported. Data is entered in a spreadsheet-type format with a maximum of 32 columns and 999 rows possible. Up to 16 digits can be used and any number of data diskettes. Tests and calculations include descriptive statistics, multiple linear regression for 15 variables, F/t/Chi square tests, cross tabulations, ANOVA, histograms, X-Y plots with automatic scaling and labeling, transformations, calculations between data columns, a report generator and sorting. Results can be produced on a monitor or printer.

Higraph   US $25.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	BASIC	Bausch & Lomb Instr. &
			Systems
	HIPLOT interf.		One Houston Square
	HIPLOT plotter		Austin, Texas 78753
			USA

Higraph is a menu driven plotting package used to create charts only on one of the DMP-3,4,6 or 7 pen plotters. Types of plotting offered are line graph, pie chart and bar chart with an additional manual control mode. Nine types of lines can be plotted on the graph as desired. A title, X-axis and Y-axis label may also be entered. The intervals and ranges are manually selected and data is entered by keybord. Bar charts may have up to 5 types of shading, with bars grouped or single. A title, X- axis and Y-axis label may be

entered. The intervals and data are manually entered by the keyboard. Pie charts can have as many as 10 divisions with each division having its own label. Shading can be done by changing pen colors between the plots of each section. Manual plotting is done by raising or lowering the pen (pressing P) and moving the pen with arrow keys. The placement of labels and titles is limited to what the program provides and there is no provision for using other printers or plotters.

Histo-graph   US $29.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Hayden Publishing Co.
			50 Essex Street
			Rochelle Park, NJ 07662
			USA

Histo-graph is designed to make bar charts of time series data. No other information available at this time.

Histogram   US $5.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	Ezra Group II
	1K RAM		P.O. Box 5222
			San Diego, CA 92105
			USA

Histogram will produce a histogram of a data set given offset and cell width parameters. Descriptive statistics can also be calculated. No other information available at this time.

Histogram Plot   US $39.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Andent, Inc.
			1000 North Ave.
			Waukegan, IL 60085
			USA

The package features data entry and editing routines, Chi square goodness of fit, transformations, mean, median, standard deviation, expected values, frequencies and variable graph sizes. The source code is provided on protected disks.

Histogram Plotting   US $100.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	32K RAM	CP/M 2.2	Compco
	CRT Printer		8705 N. Pt. Washington Rd.
			Milwaukee, WI 53217
			USA

Histogram Plotting will produce a histogram on a video monitor or printer using ASCII characters. No other information available at this time.

Histograph/Scattergraph   US $9.95

Computer: Hardware: Op. System: Vendor:
TRS-80 I   16K RAM   level II BASIC   Software Exchange
                                                6 South Street
                                                Milford, N.H. 03055
                                                USA

Histograph/Scattergraph will produce a bar chart and scatter plots. No other information available at this time.

Histokit   Br St 40.00

Computer: Hardware: Op. System: Vendor:
PET   32K RAM   Telpac
                                                Cranfield
                                                Bedford MK43 OAJ
                                                G. Britain

Histokit is a menu-driven program for production of hi-res histograms of data. Data entry can be from the keyboard or disk data files. Data checking and editing can also be done. Histograms may be drawn using all or parts of the data set. Descriptive statistics can also be calculated (mean, median, standard deviations, variance, skewness, kurtosis).

INOUSTAT   US $1595

Computer: Hardware: Op. System: Vendor:
CP/M   48K RAM   CP/M 2.2   Micronomics Business
                                                  Systems
             132 col CRT   1061 54th Street
                                                Brooklin, New York 11219
                                                USA

Inoustat will analyze up to 80 data points with multiple projections. Results may be produced on a printer or plotter. The package must be custom installed for each computer!

Interactive Statistics

Computer: Hardware: Op. System: Vendor:
Apple   Serendipity
                                                225 Elmira Road
                                                Ithaca, New York 14850
                                                USA

Interactive Statistics is a menu-driven general purpose statistics package. Tests and calculations include descriptive statistics, and correlation, and ANOVA. Results include tables, histograms, and X-Y plots and can be sent to the monitor or printer.

analyzed. Seven types of regression can be used: linear, log, hyperbolic, geometric, quadratic, exponential and quadratic log. Results include the coefficient, intercept, standard deviation and errors.

Linear Programming   US $25.00

Computer:	Hardware:	Op. System:	Vendor:
	16K RAM		Miniware, Inc.
			205 Winchester Road
			Annapolis, Maryland 21401
			USA

Linear Programming will resolve different size matrices depending on available memory: 20X45 in 16K, 40X50 in 32K, and 80X100 in 48K RAM. No other information available at this time.

Linear Programming   US $95.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I		TRS BASIC	Agricultural Software
			Consult.
TRS-80 III		CP/M	1706 Santa Fe
CP/M			Kingsville, Texas 78363
			USA

Linear Programming uses the simplex method to solve up to a 50X45 matrix. The CP/M diskette costs US$ 149.95.

Linear Programming   US $45.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I			Quant Systems
TRS-80 II			PO Box 628
TRS-80 III			Charleston, SC 29402
			USA

Linear Programming will accept up to 20 variables and 20 constraints to solve a matrix using the simplex method. Each tableau of values can be inspected during computation. The optimal solution is printed.

Linear Programming   free

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive	TRS BASIC	Miss. Coop. Extension
			Service
TRS-80 III	32K RAM		PO Box 5405
			Mississippi State, MS 39762
			USA

No charge for this program. Just send your own diskette and they will return it with the program. The program can handle a 30X30 matrix with 32K memory or a 41X41 matrix in 48K memory.

Interstat   Br St 150.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM	Applesoft	Great Northern Computer, Ltd.
ITT 2020		Apple DOS	116 Low Lane
			Horsforth, Leeds L518 5PX
			G. Britain

Interstat is a general statistical package. Source code listing is available. Results include tables, plots, or histograms. No further information is available at this time.

Isis   US $250.00

Computer:	Hardware:	Op. System:	Vendor:
Apple			Information International
			Joe Bost Road
			Route 4 - Box 339
			Concord, NC 28025
			USA

ISIS was originally written for use in a rural development project in Tunisia. It is one of the few packages with manuals in French and English. A maximum of 150 observations can be entered for any single variable and up to 700 variables can be handled per record. The package permits up to 10 null or missing values for each variable. Program operation is menu-driven. Data can be edited and modified. Calculations and tests performed include transformations, means, variance, cross tabulation, correlation, multiple regression, frequencies, and sorting/grouping of data. Resuts can be produced on a monitor or printer.

Keystat   US $130.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Brooks/Cole Pub.
			555 Abrego St.
			Monterey, CA 93940
			USA

Keystat can analyze up to 200 cases but there is no data editor for making changes or corrections and data cannot be stored. Data must be manually entered for each analysis. Tests and calculations include mean, variance, standard deviation, median, mode, skewness, kurtosis, Chi square, Q tests, median test, Krunskal-Wallis test, t-test, 1&2 way ANOVA, Spearman rank correlations and Pearsons r.

Lab Statistics Package   US $50.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive		High Technology Software
			PO Box 14665
			2201 NE 63 St.
			Oklahoma City, OK 73113
			USA

Lab Statistics Package is primarily intended to assist in teaching regression. Data entry is from the keyboard or from a disk file. Up to 30 cases with two variables can be

Linear Programming   US $25.00

Computer: Hardware: Op. System: Vendor:
Apple II   MPA Enterprises
                                         Box 6020
                                         Wyomissing, PA 19610
                                         USA

Linear Programming uses the Simplex method. A maximum of 50 constants and 50 variables can be entered. Solutions can be calculated for regular variables, slack variables, surplus variables and dual variables.

Linear Programming   Br St 8.00

Computer: Hardware: Op. System: Vendor:
PET   8K RAM   N ACT Microsoft Micro Act
                                         516 Vicarrage Road
                                         EPG Baston
                                         Birmingham, B15 3ES
                                         G. Britain

Linear Programming is supplied as a source code listing. The simplex method is used. No other information available at this time.

Linear Programming v.4.1   US $20.00

Computer: Hardware: Op. System: Vendor:
TRS-80 I   16K RAM   TRS DOS   Robert L. James
                                         12010 Cabana Lane
                                         Austin, Texas 78759
                                         USA

Linear Programming (LP/80) permits the user to name variables and constraints. Calculations and results include shadow prices, slack costs, and sensitivity analysis. Calculations are done by the simplex method using either single or double precision. The sensitivity analysis includes ranges, entering/leaving variables for the constraint RHS and the objective function.

Linear Regression   Br St 25.00

Computer: Hardware: Op. System: Vendor:
PET   Supersoft
                                         28 Burwood Avenue
                                         Pinner
                                         Middlesex
                                         G. Britain

Linear Regression can handle 10 variables in 8K RAM and 27 variables in 32K RAM. The source code is available.

Linear Regression   US $25.00

Computer:	Hardware:	Op. System:	Vendor:
			MPA Enterprises
			Box 6020
			Wyomissing, PA 19610
			USA

Linear Regression will calculate linear and curvilinear regression, regression ANOVA, regression coefficients, F, Durbin- Watson, t, R squared and t values.

Linear Regression   US $90.00

Computer:	Hardware:	Op. System:	Vendor:
North Star			Enercomp Co.
CP/M			PO Box 28014
			Lakewood, Colorado 80228
			USA

No information available at this time.

Linear Regression

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	4K RAM		A.J. Harding
Vid. Genie			28 Collington Avenue
			Bexhill-OW SEA
			East Sussex
			G. Britain

Linear Regression will take X-Y data and do interpolation or weighting if desired. Results include slope, standard error of the slope, and interpolation of X for Y. The source code is available.

Linear Regression   Br St 5.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

Linear Regression can calculate slope, standard error of the slope, intercept, and the table of residuals.

LOLITA

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Brian P. Murphy
		Pascal	Raine Medical Stat. Unit
			U. Western Australia
			Nedlands, W.A. 6009
			Australia

LOLITA stands for LOg LInear modelling in TAbles. It is used to fit log-linear models on contingency tables. Large data sets can be handled. Data editing can be done plus collapsing over levels and factors. Models permit high order interactions, nested models, stepwise fitting and branch and bound and searching of heirarchical models.

LP Master   US $495.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	64K RAM		Digital Research
CP/M			PO Box 579
			Pacific Grove, CA 93950
			USA

LP Master requires 128K RAM on the IBM PC. No other information available at this time.

LP/80   US $59.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive		Decision Science Software
TRS-80 III		32K RAM	PO Box 7876
			Austin, Texas 78712
			USA

LP/80 is a menu-driven linear programming package. The size of matrix varies with available memory. The minimum size will permit a 40 x 70 matrix. Data can be stored on disk. The simplex phase I/phase II methods are used. Results include the objective function, variable values, slack or surplus, shadow prices and reduced costs. Sensitivity analysis can be done on objective function coefficients. New constraints may be added and objective or constraint coefficients can be changed. Results can be produced on a monitor or printer.

Market Charting Package   US $450.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	2 disk drives		Harris Technical Systems
	64K RAM		624 Peach Street
			Lincoln, NE 68501
			USA

This permits creation of bar charts, scatter plots, trend lines, and calculation of trend lines. No other information available at this time.

MASS

Computer:	Hardware:	Op. System:	Vendor:
CP/M		Pascal	Westat Associates
IBM PC			PO Box 631
			Subiaco
			Western Australia 6008
			Australia

MASS stands for Microprocessor Applied Statistics System. Data entry is by keyboard or from disk files. Up to 500 rows (records) and 20 columns (variables) can be entered. Data in several data files can be considered to be part of a single large data set and vice-versa. For analysis purposes records can be selected using various logical or arithmetic operators. Data can be edited, sorted and transformed. Types of tests and calculations include descriptive statistics, histograms, frequency tables, scatter plots, correlation coefficients, t- test, multiple linear regression including stepwise, Log-linear modelling for contingency tables, orthogonal polynomial fitting, Mann-Whitney runs test, and Rank order statistics.

Math/Stat Disk System   US $75.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	2 disk drives		Bluebirds
TRS-80 III			2267 23rd St.
TRS-80 II			Wyandotte, MI
			USA

Math/Stat Disk System is designed for a non-statistician. Functions and calculations include data management, linear regression, polynomial regression, multiple linear regression, descriptive statistics, T value, bar charts and plotting of data.

MDC STAT

Computer:	Hardware:	Op. System:	Vendor:
CP/M	48K RAM	CP/M 2.2	Micro Data Collection
			P.O. Box 115
			Novato, CA 94947
			USA

MDCSTAT is a menu-driven linear package for statistical data analysis. Calculations and tests include curve fitting with automatic selection of best fit (over 100 transforms can be used), multiple regression, ANOVA, calculations of missing values, t-test, descriptive statistics, data entry/editing, histograms, X-Y plots, and polynomial curve fitting (up to 8th order). Results can be produced on a monitor or printer.

Micro-Graf   US $35.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Micro-Z Co.
	48K RAM	Adv. BASIC	PO Box 2426
	Hi Res monitor		Rolling Hills, CA 90274
			USA

Micro-Graf creates bar or line graphs with titles. It requires Graftrak in the Epson printer, Color/Graphics adaptor and Print- Graf. No other information available at this time.

Micro-TSP   US $250.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Micro-TSP Assoc.
			928 Mears Court
			Stanford, CA 94305
			USA

Micro-TSP is a command driven package for time series analysis. Data entry can be from the keyboard or fom DIF files. Data can be edited, transformed and time logged while cases can be combined or subsets selected for processing. Tests and calculations include regression, Cochrane-Orcutt autoregression correction, first order serial correlation, Durbin-Watson test, autocorrelation and standard eror of estimates. Results can be plotted on a monitor and saved in a disk file. A maximum of 120 points and 34 variables can be analyzed. It is sold on a protected diskette so that backup copies and modifications are not permitted.

Micrograph   US $395.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM	Applesoft Basic	National Micro Business
			System
	1 disk drive		8400 Mopac
	centronix intrf		Austin, TX 78759
			USA

Micrograph will produce line charts, vertical and horizontal bar charts, pie charts and rectangle charts. Pie charts can have displaced sections. All charts feature shading and text editors. Results can be produced on a monitor or DMP plotters.

MICROLP   Br St 200.00

Computer:	Hardware:	Op. System:	Vendor:
Vector MZ	48K RAM	BASIC	Dr. J. P. G. Webster
			Wye College
			Wye, Ashford
			Kent TN25 5AH
			G. Britain

MICROLP is a linear programming package. It can resolve a 30X30 matrix, modify an existing matrix, calculate optimal farm plans, list binding constraints, list slack constraints and calculate net revenues for each alternative. Data may be entered from the keyboard or disk file. Results may be produced on a video monitor or printer.

Microplot

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Hytech
			Chequers Parade
			Wycombe Road, Prestwood
			Buckinghamshire HP16
			OPN
			G. Britain

Micro-plot is a command-driven plotting package. Data can be entered from the keyboard or disk files. Graphs can be done interactively or standard graphs can

be created using command files. Types of graphs produced include line graphs (with function plotting), pie charts, and histograms. Overlays of line charts can be done using up to 7 different line patterns. Pie charts can have detached segments and variable degrees of shading. Histograms can be produced with different shadings and with overlays (stacking). All charts can be produced in 3 different sizes under user control. Scaling is automatic. Titles and labels have automatic placement and colors depend on the plotter used. Several plotters can be used for the final graph. Data can be saved on disk files for future use.

Microquest   Br St 16000.00

Computer:	Hardware:	Op. System:	Vendor:
Apple		Basic	Quest Software
			Queensleigh House
			167 Qeensway
			London W2 4SB
			G. Britain

Microquest is a menu-driven package of programs for market survey/analysis. Data entry is by keyboard to floppy disks but all analysis is done using a hard disk. A 5 M hard disk can handle up to 10,000 questionnaires of 60-70 questions each. Data manipulation features include editing and verification of data, batch runs, interactive data analysis, hole counts with histogram display, cross tabulation (250 rows max, no max on columns), filtering, grouping, and weighting of data. Grouping can be done using standard logic operators. The price shown includes Microquest, an Apple II, a 5 M hard disk, a floppy disk drive, an Epson MX-100 printer and one monitor.

MicroSURVEY   Br St 1200.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	64K RAM	Fortran	Systematica
TRS-80 III		CP/M	112 Strand
IBM PC			London WC2R OAA
Apple II			G. Britain

MicroSURVEY is a package of command-driven programs for survey data entry and editing. Preliminary statistical analysis can also be performed. Only integer and alphanumeric variables can be handled. There is a limit of 50 variables per record, 120 characters per record but no limit on the number of cases or records per case. Data editing includes conditional consistency checks, range checks, logic checks and error messages. Data manipulation features include calculation of new variables (including decimal numbers) and conditional calculations. Tablulation of the data can be done in tables with as many as 4 dimensions. Each dimension can have up to 50 elements and data can be filtered and weighted. Tabulations can be made from a maximum of 3 levels of hierarchically structured data. Linear multiple regression can be performed with up to 15 variables. Statistics calculated include standard deviation, correlation coefficients, R squared, variance, F value and covariance matrix. Results can be produced on a video montior or printer.

MirrorGraph

Computer:	Hardware:	Op. System:	Vendor:
			Mirror Images Software
			1223 Peoples Ave.
			Troy, NY 12180
			USA

No further information available at this time.

Moving Average   Br St 5.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

Moving average is an instructional program for teaching the calculation and use of moving averages.

MSUSTAT   US $750.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	2 disk drives	CP/M	Richard E. Lund
	64K RAM	FORTRAN IV	Statistical Center
			Montana State University
			Bozeman, Montana 59717
			USA

MSUSTAT is a manu-driven statistical package for analysis of agricultural experiments. Data entry can be from the keyboard or disk file. The format for data entry depends upon the type of analysis desired. Up to 3 different data entry formats may be used. Missing values are not permitted. Tests and calculations include Completely Randomized ANOVA, RCBD ANOVA, factorial in RCBD ANOVA, mean comparisons, Chi square test of contingency tables, 2-way frequency tables, bivariate plots, histograms, Kruskal-Wallis test, Spearman-Rank & Pearson correlations, Mann-Whitney U test, Sign tests, probabilities, multiple linear regression, transformations and a paired t-test. Results can be produced on a monitor or a printer. Various on-screen help messages can be used during program operation. The manual has over 120 pages including references.

Multilinear Regression   US $28.94

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk/cassette		Dynacomp
TRS-80 III	16-24K RAM		1427 Monroe Ave.
Atari			Rochester, NY 14618
			USA

MLR is capable of treating multi-variate situations with no limit (other than available computer memory) on the number of dimensions. The general form of the equation fitted will be $Y=af1(X1)+bf2(X2)+cf3(X3)+etc.$ The variables are the X1. The regressed coefficients are a, b, c, etc. The functional forms, f1(X1), may be virtually

anything. MLR automatically offers a choice of nine mathematical forms, including the logarithm and exponential, as well as the simple default $f1(X1)=X1$. In addition, the user may replace the default form with his own function. These choices can be independently made for each dimension. The data input to MLR may be either from the keyboard or for cassette/disk files. Data may be loaded, saved, added to, deleted, and edited. The number of data points is limited only by the computer memory available. The outputs from MLR are the regression coefficients and the standard error associated with these coefficients. MLR also supplies the standard error of the estimate for the fit and the correlation coefficient. Finally, MLR offers the opportunity to use the regressed equation to calculate values along the fitted hyper-curve.

Multiple Factor Analysis   US $149.95

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives	PC DOS	Mathematical Software Co.
Apple II	64K RAM		PO Box 12349 El Cajon, CA 92202 USA

Multiple factor analysis is supplied in two forms; BASIC and compiled. The unprotected package has five modules. Data can be entered as primary data, a correlation matrix or a factor loading matrix. The compiled IBM version will handle a 50X1000 primary data set, a 50X50 correlation matrix or 10X15 factor loading matrix. The Apple version will handle a 35X100 primary data set, a 35X35 correlation matrix or a 10X10 factor loading matrix. The uncompiled BASIC versions have lesser capacities. Demonstration data sets are included. There are several built in stopping points where lengthy calculations can be paused.

Multiple Regression   US $59.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC		BASIC	Starware Suite 504 2000 K St., N.W. Washington, D.C. 20006 USA

Multiple Regression is provided in both compiled and source code form. There is no data entry module! Data files must be created by other software. Calculations and results include correlation matrix, regression coefficients, R-square and regression ANOVA.

Multiple Regression   Br St 45.00

Computer:	Hardware:	Op. System:	Vendor:
PET	32K RAM	BASIC	Alphabet Company 2 Whitefriars Way Sandwich Kent CT13 9AD G. Britain

Multiple Regression will fit a regression curve having up to 6 variables. Polynomial equations may be used. Results can be sent to a monitor or printer.

Multiple Regression   US $39.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	32K RAM	Applesoft	System Design Lab
	1 disk drive		2612 Artesia Boulevard
			Suite B
			Redondo Beach, CA 90278
			USA

Multiple Regression will produce the correlation matrix, an inverted matrix, mean and standard deviation of the estimate. Results can be produced on a monitor or printer.

Multiple Regression   Br St 50.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM	Apple DOS	Softech Ltd.
			51 LR Camden Street
			Dublin
			Ireland

This is a statistical analysis package intended for analysis of scientific data.

Multiple Regression 1.0   US $50.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 cassette		Quant Systems
TRS-80 III			PO Box 628
			Charleston, SC 29402
			USA

This package features menu oriented, interactive data entry, read and write data from tape, built-in data transformation ability, formatted for CRT, complete data editing, complete model specification (e.g., use all independent variables or specify a subset), least saquares estimates, t-values, standard deviation of estimates, table, R-squared, Durbin-Watson statistic, residual plot and list.

Multiple Regression 2.0   US $70.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive		Quant Systems
TRS-80 III	32K RAM		PO Box 628
			Charleston, SC 29402
			USA

The plot enables the user to perform an X-Y plot on any two variables. The Data Entry/Edit permits complete editing of any data set. The transform menu enables nth order differences, nth order lags, ln(x), exp(x), and normalization. The model creation menu allows the user to specify the dependent and independent variables for the model to be estimated. The output menu generates the estimates as well as their standard error and t- values, plus ANOVA, R, F, and the Durbin-Watson statistic. Morover, the variance/covariance matrices can be inspected and the residuals can be plotted and listed. The output can be directed to the printer or to the video display. The program can reside in a 32K disk system although most large problems will require a 48K system. In a 48K environment, the program can solve problems containing 9 independent variables with 400 observations per variable.

Multiple Regression Analysis   US $55.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	Level II BASIC	Dr. Gerald Hanweck
			2615 Oak Valley Drive
			Vienna, Virginia 22180
			USA

This program will calculate an ordinary least squares or multiple regression analysis. Results include the regression coefficient, R square, and the t value.

Multistat   US $290.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC-DOS	Davell Custom Software
	128K RAM		P.O. Box 4162
	Epson printer		Cleveland, TN 37311
			USA

Multistat is a stitistical package that organizes data in a spreadsheet format. Data entry is by keyboard or ASCII data files. Up to 64 columns and 10,000 rows can be entered. New column variables can also be calculated from existing data. Types of tests and calculations include descriptive statistics, multiple linear regression with 28 independant variables, and correlation.

Multivar   Br St 125.00

Computer:	Hardware:	Op. System:	Vendor:
PET	32K RAM		Telpac
			Cranfield
			Bedford MK43 OAJ
			G. Britain

Multivar is a menu driven liner regression program which permits up to 7 variables (1 dependent, 6 independent). Data may be entered by keyboard or from disk files. Log transformation can be used and re-runs can be done excluding previously entered variables. Calculations include, r, F, sum of squares, standard error, t, interrupt, and the linear regression formula.

Nisscast   US $379.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	80 col		Computer Sharing
			Services
TRS-80 II	64K RAM		Suite 200
Apple II			7535 E. Hamden Ave.
			Denver, CO 80221
			USA

Nisscast is a menu-driven trend analysis package with graphics capabilities. Data entry can be by keyboard or DIF files. Trend curves can be automatically calculated or calculated by a user specified method. Graphical representations include scatter plots with confidence intervals, area chart and bar chart. Scaling is automatic. Results can be produced on a monitor or printer.

Olistat   FF 1000

Computer:	Hardware:	Op. System:	Vendor:
Olivetti	128K RAM	BASIC	Olivetti France
			91 rue du Faubourg-St-Honore
			75383 Paris Cedex 08
			France

No other information available at this time.

Omnigraph   US $49.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Applesoft	Educational Computing Systems
	48K RAM	DOS 3.3	106 Firbanks Rd.
			Oak Ridge, TN 37830
			USA

Omnigraph is a menu-driven graphics package. It will produce line charts, scatter plots, bar charts, and pie charts, overlays can be made on any type of chart and labels can be manually entered. Data transformations are also possible.

Omnitrend   US $59.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Applesoft	Educational Computing Systems
	48K RAM	DOS 3.3	106 Fairbanks Rd.
	DOS 3.3		Oak Ridge, TN 37830
			USA

Omnitrend is a trend analysis package with graphical displays of some results. It features multiple regression, descriptive statistics and bivariate analysis. The programs are in unprotected BASIC.

One Way Analysis of Variance   Br St 500.00

Computer:	Hardware:	Op. System:	Vendor:
ITT 2020	48K RAM	UCSD Pascal	Courtest Services Ltd.
Apple		Applesoft	2 Abbey View Drive
			Minster
			Kent, Isle of Sheppey
			G. Britain

As its name suggests, this package will calculate a one way ANOVA plus descriptive statistics.

Optimizer   US $200.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive	CP/M	SuperSoft Assoc.
TRS-80 III	48K RAM	Applesoft	PO Box 1628
CP/M			Champaign, IL 61820
Apple II			USA

Optimizer is a menu-driven linear programming package based on the Simplex algorithm. No other information available at this time.

Pairstat   US $150.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC-DOS	Davell Custom Software
	64K RAM	BASIC	PO Box 4162
	Epson Printer		Cleveland, TN 37311
			USA

Pairstat is a statistical package for analysis of data organizerd in pairs. Tests and calculations include polynomial curve calcualtions and plotting, regression, integration of curves, sorting and user defined transformations. Up to 1000 data points can be entered and as many as 10 overlays can be plotted. Results can be produced on a monitor or Epson printer.

Personal Data Analysis   Br St 125.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Basic	Personal Computers Ltd.
	48K RAM		220-226 Bishopsgate
			London EC2
			G. Britain

Personal Data Analysis is a menu-driven package written for analysis of survey data. There are a total of seven optional modules which makeup the complete package. The price of BrSt 125.00 is for only the main module, DATAPREP. The other modules cost BrSt 75.00 each and are: GENREG (correlation & regression), TIME (time series analysis), CLUST (principal components & cluster analysis), QSIM (queing simulation), ANOVA (analysis of variance), BOX JEN (Box-Jenkins Modelling), and OPTIM (linear programming). All data entry is through DATAPREP which permits editing, transforma- tions and calculation of descriptive statistics. Data tables and graphs can also be produced. Data can also be read from or writtren to DIF files. A maximum of 4000 entries can be made in a data file. DATAPREP will also perform preliminary survey analysis such as recoding, cross- tabulation, frequency counts, histograms, and selecting subsets of data. The size of a survey data file is limited only by disk space. Results can be produced on a monitor or printer. GENREG performs correlation, linear and stepwise regression on a maximum of 200 cases with 20 variables. Calculations include the matrix, coefficients, standard errors, ANOVA, Durbin-Watson,residuals and confidence limits. TIME performs time series analysis by moving averages, linear/exponential/poly- nomial curve fitting, the 3 point method, simple exponential curve, trend curve or adaptive parameter methods. A maximum of 300 observations with 100 forecast periods can be handled. BOXJEN uses Box-Jenkins modelling to calculate trend, log and random shock effects on a file of up to 300 observations. OPTIM permits solution of a linear programming matrix of 60 variables and 40 constraints. Primary and dual solutions plus a

sensitivity analysis are calculated. CLUST permits a classification/principal components analysis of 200 cases with 10 variables using single linkage, centroid or iterative relocation algorithms. Component loading, communalities, Eigenvalues and scores are output. ANOVA will produce an analysis of variance on up to 8 way tables with 400 cases having equal/unequal replications, randomized blocks or completely randomized design, fixed or random effects and nested or hierarchical designs.

Personal Stats   Br St 195.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	32K RAM	Apple DOS	Personal Computers Ltd.
			194200 Bishopsgate
			London EL2M 4NR
			G. Britain

Personal Stats is a package useful for trend analysis. Its principle features include linear regression of up to 20 variables (each with 20 levels) principle components analysis (including varimax/quantimax rotation), and forecasting.

PERT/CPM   US $450.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	1-2 disk drives	DOS 3.3	Tercer Medio, C.A.
IBM PC	48-64K RAM	PC DOS 1.1	Centro Plaza Torre C P.H.
	132 col printer		Los Palos Grandes
			Caracas
			Venezuela

No other information available at this time.

PFS:Graph   US $125.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive	Applesoft	Software Publishing Co.
	grappler CRT		1901 Landings Drive
			Mountain View, CA 94043
			USA

PFS: Graph is a menu-driven graphics package designed to work with PFS:File but it can also be used alone. Data entry can be by keyboard, Visicalc file or PFS file. Up to 36 pairs of X-Y values can be entered. Types of charts produced include line, bar or pie charts. Pie charts can have up to 8 slices. Overlays are difficult and certain types are not possible. Labels and titles are placed automatically. If no label is entered a default label is used. Results can be produced on several dot matrix printers or the HP 7470A plotter. The package features extensive error handling so that simple charts can be produced quickly by inexperienced users. The diskettes are copy protected.

Plan 80   US $495.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	CP/M-86	Financial Modelling System
	128K RAM		Digital Marketing Corp.
	80 monitor col.		2670 Cherry Lane
			Walnut Creek, CA 94596
			USA

Plan 80 is a spreadsheet package with a graphics generator included.   No further information available at this time.

Plot II   US $44.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive		Computer Stations
	HIPLOT plotter		11610 Page Service Drive
	Apple ser. card		St. Louis, MO 63141
			USA

Plot II is a data plotting package instead of the common screen dump graphics software.   It is specifically written for an Apple II using Apple or California Computer systems 7710A serial interface cards and the HIPLOT (DMP-2) plotter.   It will create vertical bar charts for up to 9 data sets, each with different shading.   All graph parameters except the data set may be modified and the graph redrawn.

Plotrax   US $235.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	Epson printer	PC DOS	Omicron Software
	128K RAM		Suite 590 – Building 57
	color board		Executive Park South, N.E.
			Atlanta, GA 30329
			USA

Plotrax is a menu-driven graphics package which includes some statistical analysis functions.   Data entry is by keyboard.   Only line charts are produced with normal, log–log or semi-log axes. Charts can have two or three axes.   Up to 4 data sets can be charted on the same graph.   With 96K RAM 500 data points can be plotted and with 64K RAM 100 data points can be plotted.   Results can be produced on a video monitor or dot matrix printer. Statistical functions include descriptive statistics, linear regression, polynomial regression (probably curvilinear regression), curve fitting and ANOVA.   Printout requires use of of an Epson MX-80/100 printer with Graftrax and the IBM PC Color Graphics board.

Plotware Z   US $399.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	48K RAM	CP/M	Enercomp Co.
			PO Box 28014
			Lakewood, CO 80228
			USA

Plotware-Z is a CP/M based menu-driven graphics package.   Data may be entered by keyboard or from ASCII files.   Data can include negative values.   Types of graphs

produced include bar charts, pie charts and X-Y line charts. Bar charts can be vertical, horizontal or inclined with grouped or stacking of bars. Scaling is automatic or manual. There is no limit on the number of bars or shading used and overlays are permitted. Pie charts can have variable size and placement, automatic percent calculation, rotation, shading and displaced sections. X-Y line graphs feature automatic or manual axis scaling, linear/log data types, grids, variable data point symbols and variable line types. There is no limit to the number of points per line or overlays. Text can be manually entered using standard ASCII characters with variable size, rotations and justifications. In addition part of the Hershey set can be purchased for ornate or foreign character sets. Up to 235 separate colors can be handled depending on the hardware used. A large number of printers and plotters are supported including DMP plotters, HP plotters, Tektronix plotters, various dot-matrix printers, daisy wheel printers with graphics and several graphics monitors.

Polynomial Progression   US $5.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	UAS
	1K RAM		P.O. Box 612
			Haddonfield, NJ 08033
			USA

This program will calculate up to a 9th degree polynomial using least squares fitting and displays the coefficients, r square, and measure of fit.

Predictor   US $29.95

Computer:	Hardware:	Op. System:	Vendor:
Apple			Artworx
			150 N. Main St.
			Fairport, NY 14450
			USA

The predictor consists of a data entry module and a regression module. Both are munu-driven. It uses least squares regression to calculate the regression equation.

Prime Plotter   US $240.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	1 disk drive	Applesoft	Primesoft Corp.
	64K RAM		PO Box 40
			Cabin John, MD 20818
			USA

Prime Plotter is a menu-driven graphics package for the Apple II computer. Data entry is from the keyboard, a disk file or DIF files. Types of charts produced include X-Y plots, area charts, scatter plots, bar charts, figure charts, pie charts, lettering and free form graphics. X-Y plots include hi-lo plots, log scales and error bars. Scatter plots can have over 20 symbols and variable line thickness. Bar charts have variable width, 3-D bars, and up to 15 overlays. There are 10 different figures for figure charts. Pie charts feature variable dimensions, 3-D pie, displaced sections, unlimited slices, unlimited types of filling and variable locations on the screen. Labels and lettering feature upper/lower case, greek letters, scientific symbols, different orientations, bold, double width/height and different fillings for large letters. Trend analysis functions

include averaging, moving average, smoothing, growth, histograms, curve fitting, contingency table analysis and distributions. Results can be linked to form a slide show, saved on disk or printed on a dot matrix printer (Grappler or Pkaso interface) or plotted on HP7470A or Sweet-P plotters. A French version is being prepared.

PRO-GRESS US $50.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Cognitive Products
			PO Box 2592
			Chapel Hill, N.C. 27514
			USA

Pro-Gress will accept data from tapes or disk file and will do multiple regression, join files together, select file records and delte cases with missing data.

PTPLOT:CLUSTER + GROUP DISPLAY US $100.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M 2.2	COMPCO
			8705 N. Pt. Washington Rd.
			Milwaukee, WI 53217
			USA

PTPLOT is a cluster analysis/plotting program. It will display labeled cluster groupings with group number at the mean location of each cluster. Data points can be assigned different symbols. Results can be produced on a monitor or printer.

Randomized Complete Block Design Br St 500.00

Computer:	Hardware:	Op. System:	Vendor:
ITT 2020	48K RAM	UCSD Pascal	Courtest Services Ltd.
			2 Abbey View Drive
			Minster
			Kent, Isle of Sheppey
			G. Britain

This program will perform ANOVA for data from a randomized complete block design. The maximum number of treatments is 50 and maximum number of blocks is 50.

Regress Br St 15.75

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	32K RAM		A.J. Harding
TRS-80 II			28 Collington Avenue
Vid. Genie			Bexhill-On-Sea
			East Sussex
			G. Britain

This is a multiple regression package. Data may be edited and stored on disk.

Regress/80   US $49.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive		Decision Science Software
TRS-80 III	32K RAM		PO Box 7876
			Austin, Texas 78712
			USA

Regress/80 is a simple linear regression package. Data entry is from keyboard or disk files. Data can be edited and transformed. Results include predicted values, confidence limits, a plot of the results, standard deviations and correlation coefficient. Results can be produced on a monitor or printer.

Regression I   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16-24K RAM	Atari BASIC	Dynacomp, Inc.
Atari		CBASIC	6 Rippingdale Road
PET			Pittsford, New York 14534
			USA

REGRESSION I is a regression curve fitting package for the analysis of linear and non-linear, one-dimensional data. It is based on various subroutines and techniques presented in Volumes 1 and 2 of BASIC Scientific Subroutines (by F. Ruckdeschel). The analysis is interactive, permitting the user freedom in experimenting with fitting functions and orders of approximation. Once the regression has been performed, the user may immediately repeat the analysis using the same data set (with editing if desired) and test other functional forms.

Regression II (Parafit)   US $126.45

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I		Atari BASIC	Dynacomp, Inc.
Atari		MBASIC	6 Rippingdale Road
Delta			Pittsford, New York 14534
			USA

This was written as a companion program for Regression I by Dynacomp. It does parametric least squares regression for determination of non-linear coefficients. The method used employs a modified steepest descent with user interaction to determine the parameters. It will also plot the data and the function.

SAE

Computer:	Hardware:	Op. System:	Vendor:
Apple		Applesoft	James A. Garcia C.
			Calle 32 No. 36-05
			Palmira
			Colombia

SAE (Sistem de Analisis Estadistico) is a menu-driven package designed for analysis of agronomic data. Data entry by keyboard can be in any order desired with up to 100 treatments per replication. The experimental designs and tests covered are Completely Randomized Design (with up to an AxBxC factorial), Randomized Complete Blocks Design (with up to an AxBxC factorial), Split Plot Design, Duncan's Mutiple Range test, bar charts, LSD, and ANOVA. Results can be produced on the monitor or printer.

SAFOR Sales Analyst and Forecaster   US $21.50

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	32K		Sandy Point Publications
			P.O. Box 8531
			Boise, ID 83707
			USA

SAFOR (Sales Analyst and Forecaster) can estimate trend lines up to 12 months ahead with seasonal adjustments. Results can be produced on a monitor or printer. Graphs of trend lines can also be produced.

Sales Forecast   US $16.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	16K RAM		Progressive Software
			PO Box 273
			Plymouth Meeting, PA
			19462
			USA

Sales Forecaster will automatically select the best fitting curve from linear, log, power, or exponential transformed data. The transformation may also be numerically specified.

SAM   Br St 335.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		BASIC	International Software
PET		CP/M	PO Box 160
Apple			Welwyn Garden City
			Herts AL8 6TQ
			G. Britain

No further information available at this time.

Sample Calc   US $60.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	1 disk drive		Abt Assoc.
			55 Wheeler St.
			Cambridge, MA 02138
			USA

Sample Calc is a specialized menu-driven package for calculating the size of sample needed for a survey. A large number of prompts and screen messages are given so that no written manual is provided! Given the type of statistical analysis desired, desired confidence levels, power levels and effect sizes the program will calculate the recommended sample size. The statistical analysis procedures covered are t-test of means, t- test of proportions, sign tests, correlation, Chi square, F-tests, multiple regression and multiple correlation. The crosstabs option will estimate samples for 24 degrees of freedom. The program is supplied on a protected diskette so that backup copies or modifications are not permitted.

Scientific Plotter   US $25.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM	Applesoft	Interactive Microware
	Applesoft ROM		PO Box 771
			State College, PA 16801
			USA

Scientific Plotter is designed to generate X-Y plots of data or equations. Data can be entered from the keyboard or from disk files. Decimals and negative values an be entered. The X-Y plots can have 4 quandrants, up to 20 plotting symbols, error bars for each point, and manually entered titles. Text can include scientific symbols and features rotation. Results cn be poroduced on a video monitor or graphics printer. Versions are available for the HP-7470A and Houston Instrument DMP series plotters.

Scientist   US $99.95

Computer:	Hardware:	Op. System:	Vendor:
Apple			Monument Computer
			Services
			PO Box 603
			Village Data Center
			Joshua Tree, CA 92252
			USA

Scientist features data management functions and statistical analysis. Calculations include distributions (normal, t, poisson), Chi square, regression, and descriptive statistics.

Simplex Linear Programming   US $9.95+

Computer:	Hardware:	Op. System:	Vendor:
OSI	24K RAM		Aurora Software
			Associates
			PO Box 99553
			Cleveland, OH 44199
			USA

A source code listing of Simplex Linear Programming is available. We have no other descriptive information at this time.

SNAP   Br St 645.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	64K RAM	BASIC	Mercator Computer
			Systems
			3 Whiteladies Road
			Clifton
			Bristol BS8 1NU
			G. Britain

SNAP somehow stands for Survey Analysis Package. It is menu- driven with numerous safeguards against operator error. Data entry is by keyboard and two modes

are available: card punch format and fill-in-the-form format. Data files created by dBase II can also be used. A maximum of 32,000 records (questionnaires) and 192 variables (questions) can be handled in a single file. The response to a single question may have up to 5 digits and as many as 30 response codes can be given to a question. Up to 15 answers can be given in response to a single question. Data can be validated in the card punch format. Types of tests and calculations performed include hole counts, cross-tabulations (weights, filters), histograms and lists of data subsets. Analysis can be done interactively or in a batch mode using command files. The maximum size of a single cross- tabulation is 30x30. Results can be produced on a video monitor, printer or disk. There is a provision to link to word processors.

STADT   free

Computer:	Hardware:	Op. System:	Vendor:
HP-9845B	Graphics	Adv. BASIC	Dr. Alvin J. Smucker
			Dept. Crop & Soil Sci.
			Michigan State Univ.
			E. Lansing, MI 48824
			USA

STADT is a menu-driven package for analysis of agronomic data. It can handle 500 plots of data and will calculate ANOVA for completely randomized, randomized complete block, and two/three factor (with/without splits), and experimental designs. Mean separation (LSD, DMR) and standard deviation are also calculated. Results can be printed as a data table or in a graphical format.

STAPL   Br St 190.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	64K RAM	CP/M 2.2	Alan Pearman Ltd.
			Maple House
			Mortlake Crescent
			Chester CM3 5UR
			G. Britain

STAPL will calculate descriptive statistics, correlation, regression, probability distributions, and ANOVA. It can also link to a report generator and graphics package by the same vendor.

Stat Power   US $50.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			ABT Microcomputer
			Software
			55 Wheeler Street
			Cambridge, MA 02138
			USA

Stat Power follows many of the procedures in "Statistical Power Analysis for the Behavioral Sciences" (Academic Press, N.Y. 1977) and is designed for classroom use. It will calculate sample sizes, t, sign test, simple correlation, multiple regression, F, and Chi square.

Stat-Pac   US $40.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I			Quant Systems
TRS-80 II			PO Box 628
TRS-80 III			Charleston, SC 29402
			USA

No further information available at this time.

Statistical Analysis

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Aereocomp, Inc.
			3303 Harbor Boulevard
			Costa Mesa, CA 92626
			USA

No further information is available at this time.

Statistical Analysis   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Spectrum Software
			P.O. Box 20
			142 Carlow
			Sunnyvale, CA 94086
			USA

Statistical Analysis is a menu-driven program to calculate linear regression, standard deviation and to plot frequency distribution of the data.

Statistical Analysis Group

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Inst. of Industrial
			Engineers
			25 Technology
			Park/Atlanta
			Norcross, GA 30092
			USA

The Statistical Analysis Group is a set of 4 programs to calculate distribution fits to a predetermined curve, polynomial curve fitting, variance, and t-test. Histograms can also be plotted.

Statistical Distribution Pack   Br St 7.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham, B15-3ES
			G. Britain

Statistical Distribution Pack will calculate correlation, percentile, and Chi square distribution. It will also calculate Poisson, Gaussian, positive and negative distribution.

Statistical Package I   US $22.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive	Level II BASIC	Dr. D. Kauffman
	16K RAM		2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

Statistical Package I includes calculations for one/two way ANOVA, one way within subject ANOVA, between subject t-test and within subject t-test.

Statistics   Br St 10.00

Computer:	Hardware:	Op. System:	Vendor:
PET	32K RAM	UCSD Pascal	Databank
ITT 2020	PET disk drive		66 Queens Road
			Loughborough
			Leicestershire LE11 1HD
			G. Britain

Statistics will calculate mean standard deviation and produce a histogram. Results can be produced on a monitor or printer.

Statistics   Br St 7.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

This program will calculate mean, variance, standard deviation, binomial/normal distribution, frequency, probability, Chi-square, and t-test.

Statistics   US $29.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	32K RAM	Applesoft	Edu-Ware
Atari	ROM card		Suite 102
			22222 Sherman Way
			Canoga Park, CA 91303
			USA

Statistics will calculate mean, variance, standard deviation, probabilities, frequency, Chi-square, t-test, and Pearson product moment correlation. The disk is copy protected and only the Silentype printer can be used for paper output.

Statistics   Br St 19.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	24K RAM	Apple DOS	Micro Act
			516 Vicarrage Road
			EPG Baston
			Birmingham B15-3ES
			G. Britain

This statistics program will calculate the mean and standard error for up to 200 data points. As many as 50 groups of data can be analyzed for t tests and probability level. Data can be stored on cassette.

Statistics   US $9.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	Sinclair Research Ltd.
	2K RAM		Stanhope Road
			Camberley
			Surrey GU15 3PS
			England

This consists of 3 programs. Part I does calculation of mean, standard deviation. Part II does regression, mean, standard deviation, intercept, and slope. Part III does trend analysis. Program 2 does Chi-square and Program 3 plots graphic displays of data entered from keyboard.

Statistics (BIO) II   US $60.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	2 disk drives		A2 DEVICES
	48K RAM		PO Box 2226
			Alameda, CA 94501
			USA

Statistics (BIO) II is written for a graphical presentation of statistical analyses. Calculations performed are ANOVA, t-test, Mann-Whitney U test and Wilcoxon paired test. In addition, graphical displays can be produced for linear regression, exponential regression, X-Y data plots and curvilinear regression. Graphical results may be plotted on a Watanabe WX 4671 plotter with a Takahasi interface.

Statistics I   US $19.95

Computer:	Hardware:	Op. System:	Vendor:
Atari	16K RAM		Atari, Inc.
	1 cassette		1265 Borregas Avenue
			Sunnyvale, Calif. 94086
			USA

Statistics I will calculate descriptive statistics such as mean, mode, median, and root mean square. A data editing feature permits correction of data. A disk version and printer output are optional.

Statistics Library   US $1500

Computer:	Hardware:	Op. System:	Vendor:
HP 85			Hewlett-Packard
HP 9826			3400 E. Harmony Rd.
			Ft. Collins, CO 80526
			USA

Statistics Library will edit data and calculate various parametric and non-parametric tests. No other information available at this time.

Statistics Pac $99.95

Computer:	Hardware:	Op. System:	Vendor:
Apple II	32K	Apple DOS	Charles Mann & Assoc.
			7594 Sam Remo Trail
			Yucca Valley, CA 92284
			USA

Statistics Pac includes a data management system. Calculations and tests include analysis of permutation/combinations/factorials and plotting of curves.

Statistics Pac   US $100.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I		Basic	Creative Discount
			Software
Apple II		Applesoft	Suite 2156
TRS-80 III			256 S. Robertson
			Beverly Hills, CA 90211
			USA

Statistics Pac will calculate permutations, combinations, factorials, and distributions (binomial, Poisson, normal, chi square, student-t). Plotting is also included on the Apple II version.

Statistics Package   Br St 40.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	32K RAM	Applesoft BASIC	Lombardi Computers
			121 High Street
			Berkhampstead
			G. Britain HP4 2DJ

Statistics Package will calculate mean, variance, standard deviation, linear regression, Chi-square, and ANOVA.

Statistics Package   US $50.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Old Bird Software
			John C Dvorak
			704 Solano Ave.
			Albany, CA 94706
			USA

Statistics Package features descriptive statistics, regression, ANOVA, and histograms of data.

Statistics Package I   US $24.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	Applesoft	On Going Ideas
Apple	80 col printer	Apple DOS	Rt. 1 - Box 810
			Starksboro, Vermont 05487
			USA

Statistics Package I will calculate Wilcoxon Rank sum, t-test nd X-Y data plots.

Statistiques   FF2500

Computer:	Hardware:	Op. System:	Vendor:
Canon			Canon France
			93154
			Le Blanc-Mesnil
			France

No other information is available at this time.

Statmanager   US $249.95

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Hayden Software
			600 Suffolk Street
			Lowell, MA 01853
			USA

Statmanager is advertised as a system which contains database management, statistical analysis and graphics. It is a command driven packagae. Data entry is by keyboard or disk file. There is no provision for reading data files from other programs. The amount of data permitted depends on the disk storage available. On an 8 inch disk up to 2512 rows of data with 128 characters can be stored in 314K. Decimals and negative numbers can be entered but there is a limit of 6 digits for each data. Data is entered and stored in a spreadsheet type of format with user defined column/row labels. New values or columns can be calculated using standard formulas. Data dan be sorted, edited or listed. Statistical functions include frequency distributon, descriptive statistics, t-test, F-test, and correlation. Graphics output includes ASCII characters, X-Y plots, regression lines and frequency distribution plots. Results can be produced on a monitor or printer.

Statpak

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	42K RAM	Basic-80	Lifeboat Assoc.
CP/M			1651 Third Ave.
Heath			New York, NY 10028
			USA

Statpak is a library of statistical programs with features for data entry, editing, merging, transformation, and subset creation. Calculations and tests performed include probabilities, regression, contingency tables, ANOVA, and mean testing.

Stats   US $6.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	Level II BASIC	Dilithium Press
			30 NW 23rd Place
			Portland, Oregon 97210
			USA

Stats will sort and calculate descriptive statistics for a data set.

Stats-Graph   US $200.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Supersoft
			P.O. Box 1328
			Champaign IL 61820
			USA

Stats-graph is designed to be used on a minimum configuration CP/M computer and printer. It will do descriptive statistics on data (mean, median, min and max values, standard deviation and regression). Graphic formats are pie graph, bar graph, and scatter graph. All operationa are menu driven. Data entry and editing facilitaties are included. There is no provision for titles on the X or Y axes and the resulting graphs are composed of standard ASCII characters (X, O, +, *, etc). The result is a graph which is not as pretty as a plotter drawn graph but if your printer can only do ASCII characters on fixed spacing then this package may be useful.

Stattest   US $33.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk		Dynacomp
TRS-80 III	or 1 cassette		1427 Monroe Ave.
Zenith			Rochester NY 14618
Heath			USA

STATTEST performs statistical tests of hypotheses and includes t-tests, chi-square tests,and F-tests as well as simple regression and a random number generator. Data can be entered under program control or from a tape, disk or an external file which already contains data in the format required. Once data is loaded it may be edited by the program's own data manipulation routine. Data can be changed, added, deleted, or any combination thereof. Data can also be listed upon entry and after editing if desired. When the data is ready, descriptive statistics are calculated, the hypothesis to be tested is stated, and the test is performed. Previously calculated statistics may be optionally used instead of data entry.

Stepwise Multiple Regression   US $139.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	2 disk drives	TRS DOS	Barstrann Corporation
	48K RAM		PO Box 265
	132 col printer		Midcity Station
			Dayton, Ohio 45402
			USA

Stepwise Multiple Regression is a menu-driven package of 11 programs which include a data management subsystem. As many as 60 variables can be included in a

single analysis and up to 64 observations on 100 variables can be stored on disk. Multiple diskettes can be used. Calculations and tests performed include stepwise mutiple regression, means, standard deviation, regresssion coefficients, correlation coefficients, R square, residuals, F values, and correlation matrix. Residuals can be plotted on a monitor or Silentype printer.

Stepwise Multiple Regression   US $150.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Apple Computer Co.
			10260 Bandley Drive
			Cupertino, CA 95014
			USA

Stepwise Multiple Regression is a menu-driven package of 11 programs. Up to 60 variables can be included in a single run. A maximum of 100 variables with 64 observations each can be stored on a single disk and multiple data diskettes can be used. Types of tests and calculations included are standard deviation, F, multiple correlation coefficients, residuals, means, regression coefficients and the correlation matrix. Scatter plots of the residuals can be printed on a Silentype printer.

SuperPlot

Computer:	Hardware:	Op. System:	Vendor:
Apple III			Microware Associates, Inc.
			220 East 50th Street
			New York, NY 10022
			USA

Superplot is a graphics package for the Apple III that permits generation of graph and saving on disk or printing on a printer. No other information available at this time.

Superplotter   US $69.95

Computer:	Hardware:	Op. System:	Vendor:
Apple	1 disk drive	Applesoft	Dickens Data Systems
	DOS 3.3		Suite A
			3050 Holcomb Bridge Rd.
			Norcross GA 30071
			USA

The superplotter is a menu driven program which comes on an unprotected disk written in Applesoft BASIC. It will generate standard pie graphs with or without shading, with the sectors labeled and with a title. Bar graphs may have X and Y-axis labels, title and shading or open bars. Line graphs may plot up to 99 points on a single line with a title and X,Y-axis labels. It is also possible to generate an equation by least squares curve fitting and then plot the curve. This includes analysis for linear regression and scatter plots. A maximum of 99 data sets and 9th degree equations can be calculated. In addition to the title and label function stated, additional text may be entered in any position using the Graphics Screen Text Editor function. Charts of multiple data sets can be produced and different types of charts superimposed. The screen display is hi-res. Graphics images may be stored on disk and recalled for later printing or modification. There is also a data file editor to permit storage, correction or updating of data files. The program comes set up for a Silentype printer or an Epson

MX-80 printer with a Grappler interface. Unfortunately, there are no driver routines included for other printers or plotters. Very brief instructions are given in the manual about where to insert a printer/plotter drive routine in the program but it is up to the user to find or write a subroutine that will transfer the screen display to a printer. A brief section in the manual is dedicated to the data file structure used by Superplotter and how to read other data file formats.

Survey Analysis   Br St 8.00

Computer:	Hardware:	Op. System:	Vendor:
PET	8K RAM		Micro ACT
			516 Vicarrage Road
			EPG Baston
			Birmingham
			G. Britain B15 3E5

This program will analyze results of small surveys. In 8K RAM as many as 80 questionnairs of 12 questions each can be handled. More data can be handled with larger RAM capacities.

Survey Analysis   US $23.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II			Computer House Division
			1407 Clinton Road
			Jackson, MI 49202
			USA

Survey Analysis will analyze coded survey results of small surveys such as 80 questionnaires of 12 questions each.

Survey Data Processing System (1.1)   free

Computer:	Hardware:	Op. System:	Vendor:
North Star	2 disk drives	North Star DOS	Ronald Steele
CP/M	64K RAM	CP/M + BAZIC	USDA/SRS
	80 col. printer	Joeshare+ BAZIC	Rm. 3524-S
			Washington, D.C. 20250
			USA

This is a general purpose menu-driven package for survey data analysis. It can handle relatively long questionnaires. Calculations and tests performed include unbiased sums, variance, and coefficient of variance. Data files can be written which are compatible with Micro Stat to permit more complex statistical analysis.

Survey System   US $495

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive		Creative Research Systems
	96K RAM		1864 Larkin St.
			San Francisco, CA 94109
			USA

The Survey System is a menu-driven data entry and tabulation package for survey data. Data entry is by keyboard or an optional card reader. Editing features include

addition or deletion of questionnaires, correction of data, calculation of new variables and combination of data files. Up to 1000 data columns can be entered for each questionnaire. Although not defined, this is assumed to be equivalent to 1000 columns of a punched card format. Types of tables and calculations produced include cross-tabulations and score tables, frequencies, standardized scores, standard deviation and Chi square. Tables can be produced on a monitor, daisywheel printer or disk files. Bar charts can also be printed.

Survey System   US $450.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Creative Research Systems
	64K RAM		Suite 2
			1864 Larkin Street
			San Francisco, CA 94109
			USA

Survey System is a menu-driven package to enter, edit and process survey data. Data entry features range checks and verification. Up to 250 answers per questionnaire can be entered. New variables can be calculated or old variables weighted or scored. Cross tabs can be created from subsets of the data. Results can be produced on a monitor or printer.

Survtab   US $180

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	2 disk drives	BASIC	Statistical Computing
			Consult.
	64K RAM		9025 Andromeda Drive
			Burke, VA 22015
			USA

Survtab is a tabulation package for survey data. Data entry is by keyboard with editing features. One-way frequency distributions, cross tabulations, descriptive statistics and subset selection can be done., As many as 80 questions can be entered, some with multiple responses. About 2000 questionnaires can be entered on one diskette.

T-Test B   US $4.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 cassette	level II BASIC	Dr. D. Kauffman
	16K RAM		2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

T-test B will calculate a t-test between subjects using a fixed effects model. It will produce t value, means, standard deviation, probability and a data listing.

T-Test W   US $4.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	16K RAM	Level II BASIC	Dr. D. Kauffman
			2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

T-Test W is written to calculate a t-test for within subjects comparisons. It will produce t value, mean, standard deviation and probability.

T/Maker   US $275.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M	48K RAM	CBASIC-2	Lifeboat Associates
	cursor address		1651 Third Avenue
	screen clear		New York, N.Y. 10028
			USA

T/Maker II is basically a spreadsheet with functions for financial calculations. It includes functions for descriptive statistics and will do projections based on time series data.

Tape Manager and Adv. Statistics   US $24.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 disk drive	Level II BASIC	Creative Computing
			Software
	16K RAM		PO Box 789-M
			Morristown, N.J. 07960
			USA

This is a package of 8 programs for data entry, editing and statistical analysis.

Technical Analysis Package   US $89.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 II	32K		Ampero Software Products
	1 or 2 disks		5230 Clark Ave., Suite 12A
	80 col printer		Lakewood, CA 90712
			USA

The Technical Analysis Package is a trend analysis package. It features data and editing plus price cycle forecasting. This is a combination of multiple regression and spectral analysis for producing a price curve. Moving averages can calculate up to 5 standard corrected and inverse averages at once. The momentum/volume analysis program will produce a set of descriptive parameters for any particular data set. Results can be produced on a monitor or printer.

Time Series and Statistical System   US $120.00

Computer:	Hardware:	Op. System:	Vendor:
NorthStar	32K RAM	NorthStar BASIC	Potters Programs
			22444 Lakeland
			St. Clair Shores, MI 48081
			USA

Time Series Analysis is a 15 program package that includes calculations for cross correlation, fourier analysis, auto correlation, amplitude distribution, probability, interpolation, mean, variance, skewness, kurtosis, and peaks. Results can be produced on a monitor or printer. Charts feature automatic scaling.

TIMSER   US $300.00

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I			Racet Computers
TRS-80 II			Suite M
TRS-80 III			1330 N. Glassell
			Orange, CA 92667
			USA

Timser is designed to be used for time series analysis. Calculations include 1st, 2nd and 3rd order regression, seasonal index, variance, R squared, standard error, and Durbin-Watson autocorrelation. Data can be presented in tabular form including projected data points and its' confidence limits. Graphics includes X-Y plot of regression lines and a variance plot.

Trend-Spotter   US $175.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM	Applesoft/ROM	Software Resources
	1 disk drive		Suite 310
			286 Alewife Brook Prkwy.
			Cambridge, MA 02138
			USA

Trend-Spotter is primarily a trend analysis package though it could be used for graphics production also. The data entry section is menu-driven and the graphics section is command- driven. Data entry can be by keyboard or from data files. DIF read/write is also possible. Each data file can contain up to 100 values of one variable over time. Only regular time periods are permitted. Data can be added, deleted or changed. Calculations include moving averages, exponential smoothing, trend line, rate of change, summation and compound inflation adjustment. Types of graphics produced include bar graphs with overlays, side-by-side bar graphs, filled line graphs, and scatter graphs. The X axis is always time. The Y axis can have a manually set scale or automatic scaling. Results can be printed only on a Silentype printer. There is no provision for other printers or plotters.

TWG/ARIMA   US $300.00

Computer:	Hardware:	Op. System:	Vendor:
Apple II	48K RAM	Applesoft	The Winchendon Group
		TDOS 3.3	3907 Lakota Road
			PO Box 10114
			Alexandria, VA 22310
			USA

TWG/ARIMA is a time series modelling package. It consists of 3 programs. The first does transformations, seasonal adjustments and the Box-Cox transformations as needed. Results include mean, standard deviation, autocorrelation and confidence intervals. The estimation program estimates seasonal, autoregression or moving average parameters, calculates t-statistics, correlations, Box Pierce Q statistic and probabilities. The forecasting program creates estimated values for various starting and end points. Utility programs permit data entry and editing.

Ultra Plot   US $70.00

Computer:	Hardware:	Op. System:	Vendor:
Apple	48K RAM		Avant-Garde Creations
	1 disk drive		PO Box 30160
			Eugene, OR 97403
			USA

Ultra Plot will create pie, scatter, line, and bar charts plus a map chart. Overlays are possible on all types of charts. Editing is possible to refine charts and single or multiple grid lines are possible. Both decimal and negative values can be plotted. Month/year graphs have automatic labeling and other charts can have labels and titles as desired. Map charts can have up to 5 colors and pie charts up to 3 colors. Statistical calculations include mean, standard deviation, slope, y interupt, R squared, standard error, regression, and max/min values. Results can be produced on a monitor or printer.

Variance Analyzer   US $14.95

Computer:	Hardware:	Op. System:	Vendor:
Sinclair	1 cassette	Sinclair	Zeta Software
	16K RAM		P.O. Box 3522
			Greenville, SC 29608
			USA

Variance Analyzer will calculate one or two way ANOVA, covariance, and treatment means.

VisiPlot   US $200.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	Applesoft	VisiCorp
CP/M	48K RAM	CP/M	2895 Zanker Road
Apple II			San Jose, CA 95134
			USA

VisiPlot is a command-driven graphics package that is part of the Visi series. Data entry is by keyboard or from VisiCalc disk files. Types of charts produced include line charts, bar charts, X-Y plots, pie charts and high-low charts. Options include automatic scaling, symbol choice, grids, titles and colors.

Visitrend/Visaplot   US $300.00

Computer:	Hardware:	Op. System:	Vendor:
IBM PC	1 disk drive	PC DOS	Visicorp
	64K RAM	Adv. BASIC	2895 Zanker Road
	color/graphics		San Jose, Calif. 95134
			USA

Visitrend/Plot is a combination of Visitrend and Visiplot into one package useful for trend analysis. Both are command driven with some degree of screen prompts to aid in operation. Up to 16 series of data can be handled at once with a total of 645 data points. Only 150 data points can be charted at one time. Data can be entered directly from the keyboard and from DIF files. It will calculate multiple linear regression, estimate future values, percent change, lead, log, moving averages, transformations, standard deviation, and Durbin-Watson autocorrelation.   Graphics capabilities include line, bar, area, high/low, and scatter charts. Charts can be displayed in color and with or without grid reference lines. Labels can be placed anywhere on the chart. Overlays or multiple charts can be made on bar and line charts. All results can be produced on a monitor or graphic printer.

WANOVA-1   US $4.95

Computer:	Hardware:	Op. System:	Vendor:
TRS-80 I	1 cassette	Level II BASIC	Dr. K. Kauffman
	16K RAM		2546 NW 120th Terrace
			Coral Springs, FL 33065
			USA

This program will calculate a one-way ANOVA within subjects. It will produce an ANOVA, F ratio, probability, means, standard deviation, and a list of data.

XYPLOT-BARPLOT

Computer:	Hardware:	Op. System:	Vendor:
Zenith	1 disk drive	MBASIC	Reicher Digital Systems
CP/M	48K RAM	CP/M	29 Blazier Road
Heath		HDOS 4.82	Warren, NJ 07060
			USA

XYPLOT-BARPLOT is a package of programs for producing bar charts and X-Y charts. Scaling can be manual or automatic with linear or log scales. Printer graphs are produced with ASCII characters.

X-Y Vector Plot Package   US $249.00

Computer:	Hardware:	Op. System:	Vendor:
CP/M		CP/M	Leapac Services
		MP/M	8245 Mediterranean Way
		CP/NET	Sacramento, CA 95826
			USA

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ANNEX 1

A Description of MSTAT

MSTAT is a data management and statistical analysis software system designed for use on a microcomputer. Table 1 shows several of the different aspects of agricultural research where MSTAT programs can be used. Table 2 describes the various MSTAT subprograms in further detail.

The program is written from a user's orientation. It is flexible and operates in a dynamic, interactive mode. Minimum statistical knowledge and limited programming capabilities are required to use the program. Although originally designed for plant breeding and agronomic uses, it is directly usable for laboratory experiments as well as socioeconomic survey data analysis.

The equipment requirements to operate MSTAT cost about $4,500 and are as follows:

1. Microcomputer with 64K of RAM
2. CP/M operating system
3. MBASIC interpreter
4. Two disk drives
5. Printer
6. Stable A.C. power supply

Present MSTAT Capabilities are:

    A. Experimental design generation
        1. Randomized complete block
        2. Completely randomized design
        3. Up to 5 factor factorials
        4. Split-plots
        5. Lattice designs
            a) with accession record information in field notebooks
            b) with accession number only in field notebooks
    B. Field map printing
        1. Makes field maps after use of explan
    C. Label printing for above designs
        1. Planting, field stake, sample, and harvest labels

D. Field notebook printing for the above designs to facilitate data recording

    1. 80 columns (8 1/2 X 11)

    2. 130 columns

E. Data manipulation capabilities

    1. Data entry program for experimental and survey data

    2. Listing of data for inspection and correction

    3. Adding new variables as well as correcting or updating old data

    4. Hard copy listing on printer

    5. Listing of data file

    6. Subsetting of data to use only parts of the experiment (e.g., reps 1 & 2 only)

    7. Removal of extreme values before analysis

    8. Data transformation, yield calculations, etc.

    9. Generating one- or two-way frequency tables

    10. Presenting one-way tables as histograms

    11. Grouping data and assigning a new category variable for future analysis

    12. Tabular transformation of one variable to another

    13. Printing tables with optional headings

    14. Creation and movement of temporary files

    15. Adding of sums of frequency tables from other diskettes and printing as tables or histogram

F. Data analysis

    1. One-way analysis of variance with missing data

    2. Two-way analysis of variance with missing data

    3. Up to 6 factor factorial analysis of variance

    4. Hierarchical analysis of variance, with a maximum of 6 levels

    5. Split-plot analysis of variance with up to 4 splits

    6. Economic analysis: Use cost and return data to calculate net benefits and marginal rates of return by treatment

    7. Lattice analysis of variance with missing data

    8. Nonorthogonal analysis of variance

    9. Means

    10. Correlations

    11. Basic statistics

12. Regression
13. Multiple regression
14. Chi square

G. Future capabilities planned
   1. Plant breeding routine to handle crossing program and segra-gating populations
   2. Covariance analysis
   3. Multiple range test
   4. Contingency test
   5. Genotypic correlations
   6. Diallele analysis
   7. Genetic variances

Table 1. Areas Where MSTAT Subprograms Can be Used in Agricultural Research

Area	Steps Involved	MSTAT Subprogram*
1. Characterization of farmer and farming practices, problem identification, prioritizing problems, and recommendation domains	Survey data, data analysis, frequency tables, mean values correlations, regressions, multiple regressions, economic analysis	FORMREAD, FREQ, REGR, COR, MUITIREG, GROUPIT
2. Testing and verifying technologies and hypotheses	Design experiments	EXPPLAN, VARPLAN
3. Conducting and managing experiments and data	Print field maps, fieldbooks and labels	EXPBOOK, EXPLABEL, VARMAP
4. Analyzing experiments	Analyze experimental data, analysis of variance routines, regression correlations, multiple regression, economic analysis	ANOVA-1, ANOVA-2, ANOVALAT, CALC, FACTOR, NONORTHO, REGR, COR, HIERAR, MULTIREG, STAT, GROUPIT, TABTRANS, ECON
5. Report writing and recommendations	(In combination with a word processor) Print tables, means, histograms	FREQ, TOTEMP, FROMTEMP, MEAN, TABOUT

* For subprogram description, see Table 2.

Table 2. Subprograms of MSTAT - July 1983

ADDON	Makes one file of two or more similar data files
* ANOVA-1	Computes one-way analysis of variance with means, etc.
* ANOVA-2	Computes two-way analysis of variance, estimates missing values, produces means
ANOVALAT	Analyses lattice experiments
BLANK	Produces empty data sets
* CALC	Calculates new variables and data transformation
CHISQ	Computes chi-square and tests for homogeneity
* COR	Computes simple correlations
DATENTRY	Inputs data from keyboard
DEFINE	Defines (gives number of characters to) variables
ECON	Executes economic analysis of agricultural experiments
EXPBOOK	Prints fieldbook from EXPPLAN
EXPLABEL	Prints labels for experiments after use of EXPPLAN
EXPPLAN	Creates randomized complete block, factorial and split plot plans
* FACTOR	Computes 3, 4, 5 or 6 factorial analysis of variance
FORMREAD	Enter data from a questionnaire
* FREQ	Computes one- or two-way frequency table (also with grouping). Adding of sums of frequency tables from other diskettes and printing as tables or histograms
FREQ	Adds together frequency tables from different files
FROMTEMP	Moves data from temporary file
* GROUPIT	Groups existing variables into new categorical variables
* HIERARCH	Computes a hierarchical analysis of variance (with a maximum of 6 levels) and tables of numbers and means in each group

* LIST	Lists data on screen for corrections
* LISTREAD	Adds new variables as well as correcting or updating old data
* MEAN	Computes averages and stores on temporary file
* MULTIREG	Computes multiple regressions
* NONORTHO	Computes averages, etc. from non-orthogonal two-way tables with analysis of variance and corrected means
* PRLIST	Prints data lists on printer
* REGR	Gives regressions within and between groups, with testing of differences between groups
* SELECT	Makes new data files from parts of old files
* SORT A	Sorts smaller data files on one or more variables
* SORT B	Sorts greater data files, long sorting keys
* SORT C	Sorts still greater files, average sorting keys
* SORT D	Sorts still greater files, short sorting keys
* STAT	Gives number, maximum, minimum, average, variance, skewness and kurtosis for each variable
* TABOUT	Prints tables with optional headings
* TABTANS	Computes new variables by table transformations
* TOTEMP	Moves data to temporary file
VARBOOK	Makes notebooks after use of VARPLAN
VARLABEL	Prnts labels for experiments after use of VARPLAN
VARLIST	Makes and prints name lists for use in VARPLAN
VARMAP	Makes and prints field maps after use of VARPLAN
VARPLAN	Constructs lattice or randomized block field plans

* These programs can use selection.

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