

# SURVO 84C

SURVO 84C is an integrated interactive environment for statisticians and other professionals in statistical analysis and computing. SURVO 84C supports the research work also by providing powerful tools for general data management, graphics, text processing, report generating and desktop publishing. Besides statistical computing, many operations related to spreadsheet computing and matrix algebra are available.

All the functions of SURVO 84C are combined by its unique *editorial interface*. Using the system is like working with a general text editor with extended capabilities in the above-mentioned areas. In statistical applications, the SURVO 84C Editor is used to control all the stages of the work from data input, screening and editing to data analysis, graphics and report writing. As the last link, SURVO 84C has a complete Color PostScript support.

SURVO 84C also provides tools for making teaching programs and expert applications as *sucros*. A *sucro* is a canned SURVO 84C session with conditional operations and prompts for the user. It is originally constructed by using SURVO 84C under the *tutorial mode* which enables saving of all the user interventions in a selected file. This file can be edited later. This technique permits making of large expert applications based on the existing operations. It also gives good possibilities for using SURVO 84C in teaching of statistics.

SURVO 84C requires 640K memory, a hard disk, a graphics adapter (VGA, EGA or CGA) and MS-DOS 3.2 or higher. On the hard disk, about 12 MB is needed for the SURVO 84C program files and other system files. During the session, the SURVO 84C Editor automatically calls the system modules as child processes according to the user's activations. SURVO 84C is an open system. It can be freely extended by writing new modules in C. A version for local area networks is also available.

The current version 4.23 of SURVO 84C includes:

## Text and data management:

- Text typing and editing in the edit field
- General management of text and tables
- Report management and printing
- Desktop publishing on PostScript printers
- Import and export of text, data, results and graphs as ASCII and PostScript (EPS) files, etc.
- Table arithmetics
- Data file management
  - Several formats from tiny lists to large data bases
  - Various tools for data input and editing
- Transformation of variables
  - user-defined transformations
  - standardized and normalized variables
- Generating data by simulation
- Data sorting and aggregation

## Statistical analysis:

- In all forms of analysis
  - conditional processing, scale type checking
  - results in the edit field, text and matrix files
- Basic statistics
- Means, std.devs and correlations
- Parametric and nonparametric tests
  - Fisher's randomization principle in use
- Frequency distributions, histograms and fitting
  - univariate distributions (standard and user-defined)
- Multiway tables of frequencies, means and std.devs
- Editing of multiway tables
- Log-linear models for frequency data
- Generalized linear models
- Linear and nonlinear regression analysis

- Regression diagnostics
- General nonlinear estimation
- Principal components, canonical correlations, discriminant and cluster analysis
- Maximum likelihood and other related solutions for factor analysis, correspondence analysis
- Rotation in factor analysis
  - orthogonal and oblique solutions
- interactive graphical and analytical methods
- Semiparametric data smoothing
- Auto- and cross-correlations
- Time series forecasting
- Linear programming
- Special methods as *sucros* and matrix programs

## Graphics:

- Bar and pie charts (several types)
- Histograms
- Correlation diagrams
- Time series, line graphs
- Matrix diagrams
- Scale transformations, probability plots
- Analytical curves, families of curves,
  - data-dependent curves, integral functions
- Contour plots
- Multivariate plotting (Chernoff's faces,
  - Andrews' plots, Draftsman's displays, etc.)
- Graphs can be saved in (PostScript) files
  - and included in reports in arbitrary size and orientation.
- Various forms of graphics can be combined.

## Computing:

- Editorial arithmetics
- Arithmetics in touch mode
- Functions related to probability and statistics
- Spreadsheet computing
- Conversions between measurement units, number systems, currencies, etc.
- Operations with polynomials
- Symbolic derivatives of functions
- General matrix interpreter
  - Basic arithmetics with matrices
  - Normalizations
  - Element by element transformations
  - Matrix decompositions (Cholesky, Gram-Schmidt, spectral, singular value)
  - Linear equations, least squares problems
  - Partitioned matrices, super matrices
  - Automatic control for matrix names, column and row labels
- Matrix programs

## Teaching and user support:

- Inquiry system (HELP)
- Tutorial mode
- Ready-made tutorials

## Freeware version (SURVOS):

A reduced freeware version SURVOS is available for noncommercial applications.

## References

- MUSTONEN, S. (1992): SURVO - An Integrated Environment for Statistical Computing and Related Areas (494 pp.)
- MUSTONEN, S. (1989): Programming SURVO 84 in C, SURVO 84C Contributions 3, Dept. of Statistics, University of Helsinki (85 pp.)

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