## General Information

### Program Files

Each program consists of at least two computer files; an executable program file (file extension of **.exe**) and a Windows HTML help file (file extension of **.chm**). Note that you can run any of the programs simply by double-clicking with your mouse on the executable file icon as it appears in Windows File Explorer. Similarly, you can read any of the help files by double-clicking with your mouse on the help file icon. Note that the Basic Statistics program has three additional files. The data files are **frtable.fil**, **mwtable.fil**, and **srtable.fil**. **Do not delete, edit, or change these files.** For more information about this program see, Section 5.2.

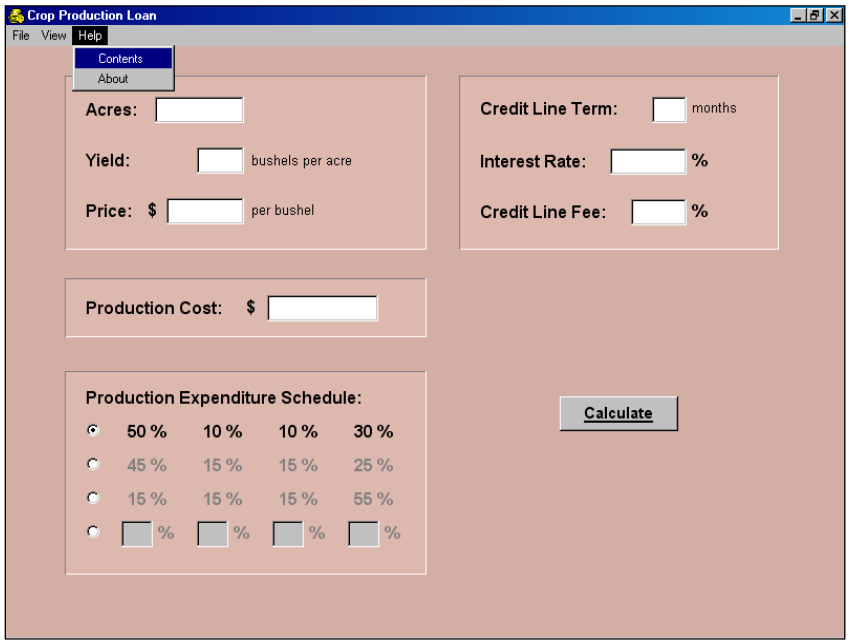
### Resizing Program Windows

The Basic Statistics program is not visually resizable.

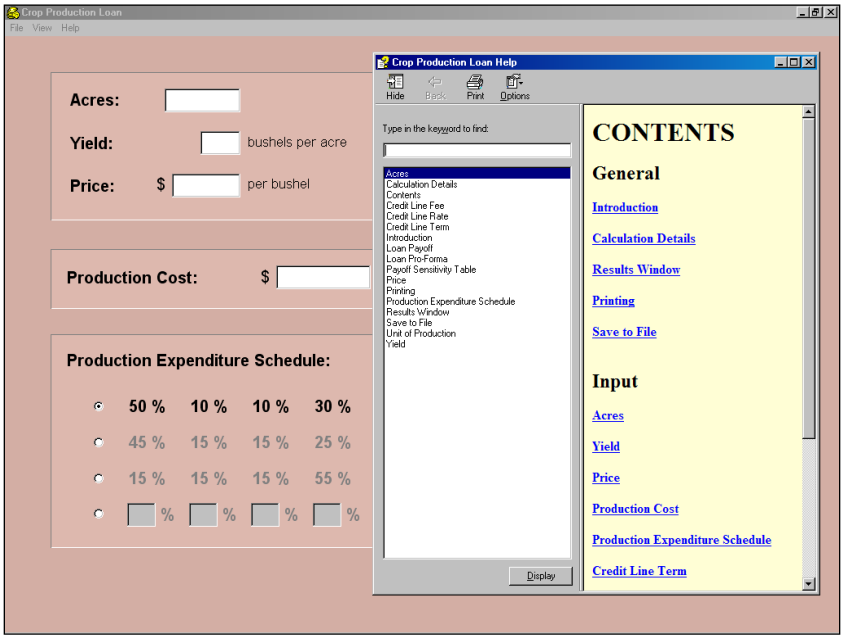
### Program Help Files

Each program has its own simple, Windows HTML help file. The help file provides you with basic operating instructions and program information. In any program of *The Banker's Analytical Aide* use the menu bar selection Help, Contents to open the help file window. When a help file is opened the table of contents is displayed.

**Menu bar selection Help, Contents.**



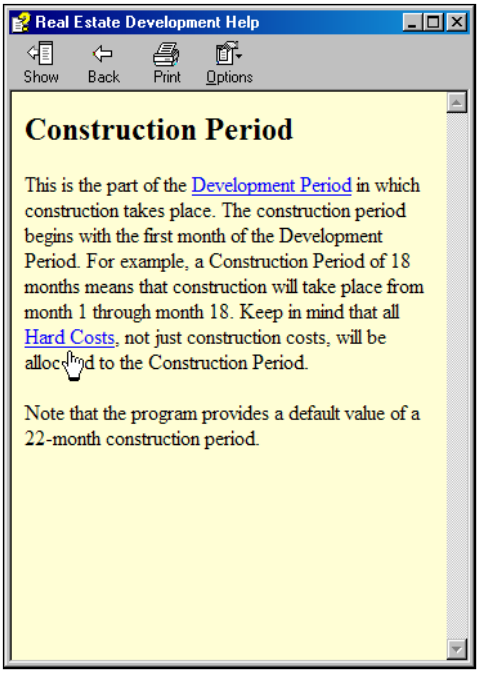
**Select Contents and the help window opens with the contents page displayed.**



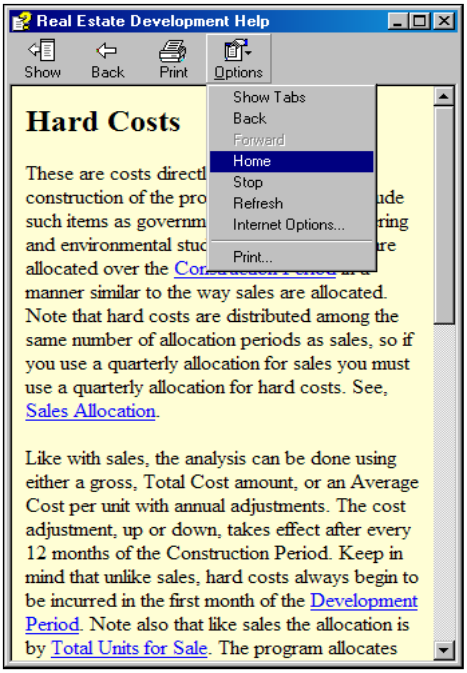

In the help window, underlined words colored blue are hypertext links to other parts of the help file. An index appears to the left of the contents page. You may hide the index with the [Hide] button.

If you left-click with your mouse on a hypertext link the linked help topic will be displayed. Note that this navigation procedure is similar to that for browsing web pages on the internet. Below is an example of a link in one help topic that leads to another help topic.

**Place the "hand" cursor on the hyperlink topic Hard Costs.**




Left-click with the mouse and the topic



As shown in the above screen shots, a [Back] button is available in the help window to return you to the previous topic. The Home selection, under the menu button [Options], will display the table of contents.

Each program also has interactive help. If a program window component, such as a button, edit box, menu bar selection, *etc*. has a help topic, you can directly display such help topic by performing the following steps.

1. Use the mouse, or keyboard <Tab> key, to place the subject component within Window's focus. (A component has Window's focus when it's ready to accept your input. In such state you'll see some change to the component's appearance. For example a dashed line will enclose a radio button or check box, while the vertical line cursor will appear in an empty edit box.)

2. Press the <F1> function key.

The help file window will open in response to the <F1> key press.

If a component does not have its own help topic then the <F1> key will open the help file with the table of contents displayed.

## Popup Hints

Each program has popup hints for certain items in the main window, as well as for subsidiary windows. Generally, popup hints display the acceptable data input range for an edit box (minimum and/or maximum values). You may toggle this feature off and on through use of the menu bar selection items No Hint and Show Hints found under View, Hints. Unlike background window color selection, hint status is independent for each program. For example, if you turn off hints for one program that action will not turn off hints in the other programs of *The Banker's Analytical Aide*.

## Basic Statistics Program

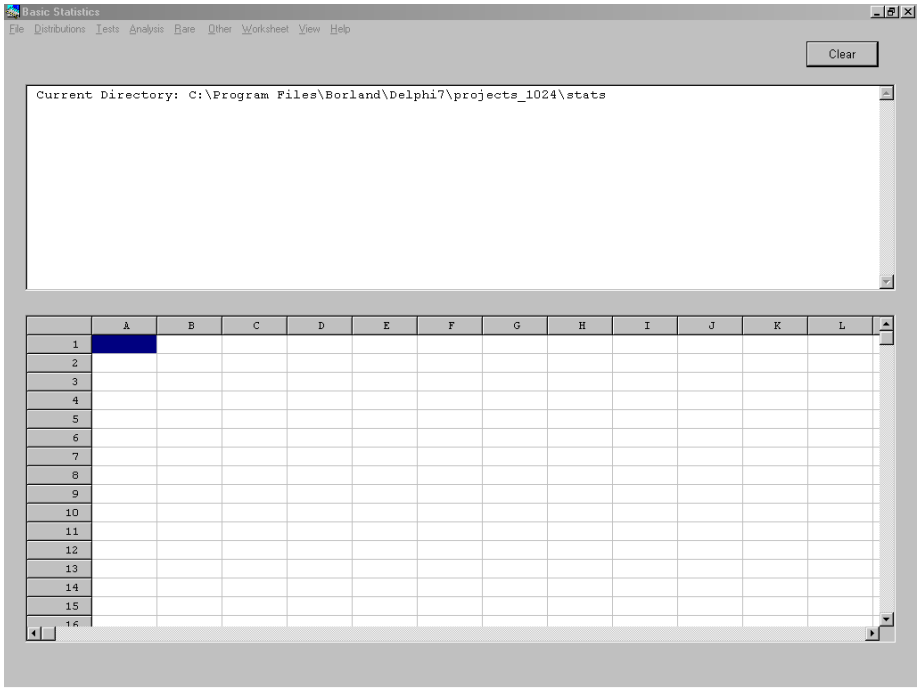
Basic Statistics is a collection of statistical functions such as numeric data analysis routines and statistical calculators that are accessed in a Windows environment. Calculators, such as the program's probability distribution calculators, operate on data that you enter into window edit boxes. Analysis routines operate on data that are in a spreadsheet-like grid called the Data Worksheet. Data can be entered into the Data Worksheet manually or loaded from a file. The program operates on numerical data only (the Data Worksheet will not accept characters). All functions are accessed through the top menubar.

The program is for users with a statistical background. Accordingly, this manual provides little information on the workings and applications of the various statistical functions. Users should consult an appropriate textbook on statistics for information on when to apply the various functions and how to interpret the results.

The program consists of five files, the executable file (stats.exe), three data files (frtable.fil, mwtable.fil, srtable.fil), and the help file, stats.hlp. All five files must be installed in the same directory. The data files contain tables of values for small sample applications of the Friedman Test, Mann-Whitney Test, and Signed-Rank Test.

*N.B.: To avoid machine rounding errors the statistical functions should be applied to data that are approximately of the same order of precision. For example, functions applied to a dataset that contains both 123456789.01 and 0.123456789 as observations are likely to produce erroneous results. In all cases results should be reliable if the observations contain no more than 7 significant digits (regardless of the decimal point location).*

### Basic Statistics Screen



### Results Window

The results window is the unlined area that occupies the upper one-third of the program's main window. When the program opens the path for the current directory appears in the top line of the results window. This directory is the one in which the program resides.

Output from the statistical test functions and the analysis functions appears in the results window. The program appends a function's output to the existing output. You may use the right scrollbar to view earlier output. You may clear the results window by depressing the Clear button in the upper-right corner of the program window.

You may not write to or delete from the results window; however, you can use standard Windows techniques to copy and paste the results window's contents to a word processing application.

### Data Worksheet

The data worksheet is the spreadsheet-like grid that occupies the lower two-thirds of the program's main window. The grid contains 26 columns and 3,000 rows for a total of 78,000 cells. The data worksheet contains the data for the test, analysis, and plotting functions of the Basic Statistics program. Each grid row represents an observation while each column represents a variable.

You can enter data into the cells manually from the keyboard or automatically from tab-delimited, ASCII text files. You may not enter character strings into the data worksheet. Data is limited to integers and floating point values, both positive and negative. Though there is no limit to the length of a numeric value that you can enter, internal data precision is limited to 20 significant digits for unsigned values and 19 signed significant digits for signed values.

The data worksheet is not a spreadsheet program; it's simply a place to store data. The program's grid operations are limited to editing cells, cutting and pasting data, and sorting.

Note that the program places certain output into the data worksheet. Output that will appear in the data worksheet are random numbers generated by the random number function and regression diagnostic statistics.

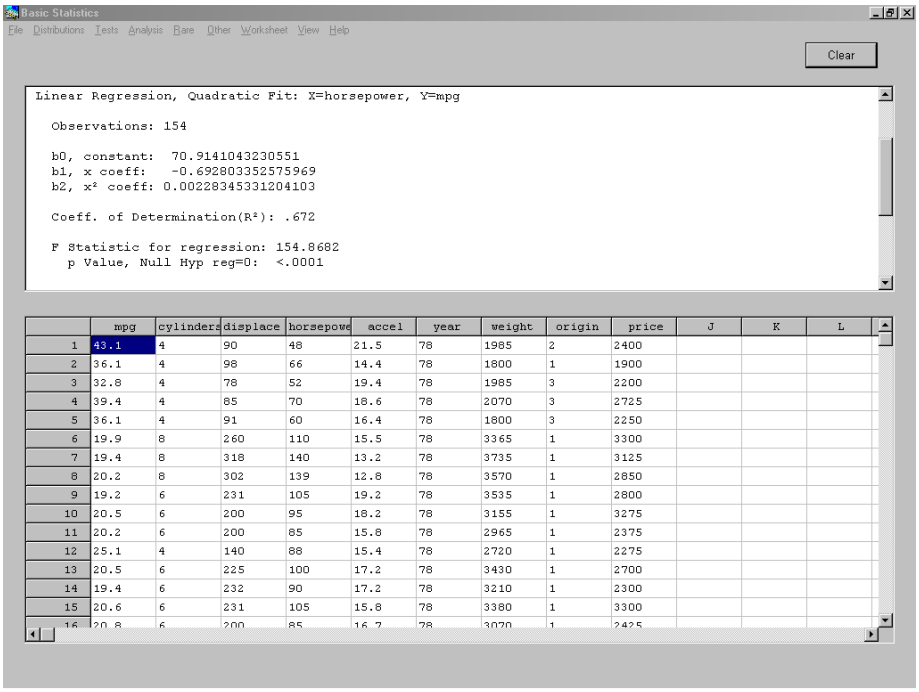
## Loading and Saving Data

You may load data into the data worksheet from any tab-delimited, ASCII text file. Use the menubar option **File, Open Worksheet** to select and open the file you want to load. If the first line contains any fields with non-numeric entries then the program treats that line as a line of column headers. Keep in mind that when you load a file you overwrite all values that are currently in the data worksheet.

The data worksheet may only contain numeric data. If any data cell in a file contains a non-numeric value, then that cell's value will not be loaded into the worksheet. In its place the marker 'ERR' will appear. Also, keep in mind that the worksheet is limited to 3,000 rows and 26 columns.

To save the contents of the data worksheet use the menubar option **File, Save Worksheet**. Though the data is saved to a tab-delimited, ASCII test file, you may assign any file extension name. The program saves headers as the first row of the file.

## Basic Statistics Screen with Data and Output




| | mpg | cylinders | displace | horsepowe | accel | year | weight | origin | price | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 43.1 | 4 | 90 | 48 | 21.5 | 78 | 1985 | 2 | 2400 | | | |
| 2 | 36.1 | 4 | 98 | 66 | 14.4 | 78 | 1800 | 1 | 1900 | | | |
| 3 | 32.8 | 4 | 78 | 52 | 19.4 | 78 | 1985 | 3 | 2200 | | | |
| 4 | 39.4 | 4 | 85 | 70 | 18.6 | 78 | 2070 | 3 | 2725 | | | |
| 5 | 36.1 | 4 | 91 | 60 | 16.4 | 78 | 1800 | 3 | 2250 | | | |
| 6 | 19.9 | 8 | 260 | 110 | 15.5 | 78 | 3365 | 1 | 3300 | | | |
| 7 | 19.4 | 8 | 318 | 140 | 13.2 | 78 | 3735 | 1 | 3125 | | | |
| 8 | 20.2 | 8 | 302 | 139 | 12.8 | 78 | 3570 | 1 | 2850 | | | |
| 9 | 19.2 | 6 | 231 | 105 | 19.2 | 78 | 3535 | 1 | 2800 | | | |
| 10 | 20.5 | 6 | 200 | 95 | 18.2 | 78 | 3155 | 1 | 3275 | | | |
| 11 | 20.2 | 6 | 200 | 85 | 15.8 | 78 | 2965 | 1 | 2375 | | | |
| 12 | 25.1 | 4 | 140 | 88 | 15.4 | 78 | 2720 | 1 | 2275 | | | |
| 13 | 20.5 | 6 | 225 | 100 | 17.2 | 78 | 3430 | 1 | 2700 | | | |
| 14 | 19.4 | 6 | 232 | 90 | 17.2 | 78 | 3210 | 1 | 2300 | | | |
| 15 | 20.6 | 6 | 231 | 105 | 15.8 | 78 | 3380 | 1 | 3300 | | | |
| 16 | 20.8 | 6 | 200 | 85 | 16.7 | 78 | 3070 | 1 | 2425 | | | |

## Using the Data Worksheet

Worksheet Navigation

The background of a cell that has the program's focus (selected for data changes) is marked with a solid, navy color. You may use the mouse-controlled cursor or the navigation keys to select which cell has the program's focus. To enter, delete, or change data in the selected cell you must "activate" that cell by pressing a digit key or the <F2> function key. When you activate a cell its background color changes from purple to white. At that point you may make changes to the contents of the cell. After you make changes exit the activated cell with the <Tab> key or any arrow key. <Enter>/<CR> will not exit a cell!

Note that you may not access a statistical function that uses the data worksheet while a data cell is active. Exit the cell with the <Tab> key or any Arrow key before using a statistical function. You will know that the cell has been exited when the program's focus changes to another cell (navy colored background appears).

The following table shows how to use keyboard keys to navigate the worksheet grid.

| Target Cursor Position | Keys |
|---|---|
| First Cell, A1 | Ctrl-Home |
| Last Cell, Z3000 | Ctrl-End |
| Last Column | End |
| First Column | Home |
| Cell Right | → or Tab |
| Cell Left | ← or Shift-Tab |
| Cell Up | ↑ |
| Cell Down | ↓ |

Manual Resizing of Columns

Place the arrow cursor between the header cells (shaded gray) to the right of the column you wish to resize. The cursor will then change to the resizing icon. While holding down the <left mouse> button move the mouse to the right to increase the column size, to the left to decrease the column size. The minimum column width is four digits.

Menubar Functions

The menubar selection **Worksheet, Clear All Cells** brings up a confirmation window. Data will be cleared from all of the cells if you confirm this selection by clicking on the OK button.

To automatically resize all columns use the menubar selection **Worksheet, Format All Columns, Auto-Fit**. To resize all columns to the default width of eight digits use **Worksheet, Format All Columns, Default Width**.

To sort a column in the worksheet select **Worksheet, Sort Column** from the menubar. In response a column selection window will open. You have the option to sort in ascending or descending order. Keep in mind that the sort function sorts the selected column only; it does not sort the worksheet on a key column! If the worksheet contains bivariate or multivariate data do not use the sort function.

Editing Data

To edit an individual cell select it with the cursor (left-click with the mouse) or with the navigation arrows. Press the <f2> function key to active the text line cursor, then use the <Backspace> key to erase numbers or the arrow keys to position the text cursor to where you want to insert numbers. When finished use any of the arrow keys or the <Shift> key to exit that cell.

## Menubar Calculation Selections

**Distributions**

Standard Normal
Student's t
Chi-Squared
F

Binomial
Poisson
Bivariate Normal

**Tests**

1-Sample t
1-Sample Sign
1-Sample Signed Rank
1-Sample Johnson's T

2-Sample t
Welch's T
Mann-Whitney
Median (2-Sample)

**Rare**

Confidence Intervals
0-Success Sample

**Analysis**

Regression
- Correlation Coefficient
- Rank Correlation Coefficient
- Simple Linear Regression
- Curve Fit
- Multiple Regression

Categorical
- 1-Factor Proportions
- Independence (2-Factors)
- Factor Effect (2x2)
- 2x2xk

ANOVA
- 1-Way ANOVA
- 2-Way ANOVA (n=1)
- 2-Way ANOVA (balanced)
- Friedman's Rank Test

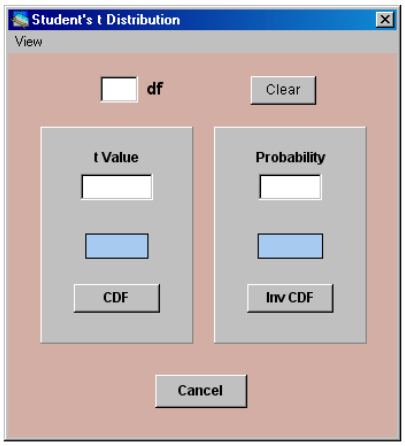
**Other**

Descriptive Statistics
Combinations
Permutations
Normal Random Numbers

Box and Whiskers Plots
Probit Plot
Symmetry Plot
Scatter Plot

## Distributions, the Probability Distribution Calculators

For each of the probability distributions listed under the menubar item **Distributions** the program provides a cumulative distribution function calculator and an inverse cumulative distribution function calculator. You input data in edit boxes that are on the small distribution calculator windows which open in response to your distribution selection. Output appears in the output edit boxes (light blue) of the distribution calculator windows. Following is an example of a distribution calculator window.




Standard Normal (Z), Student's t, Chi-Squared, F

Press the "CDF" button to get the cumulative probability for the given value of the random variable, and where appropriate, the degrees of freedom. Press the "Inv CDF" button to get the random variable value for the given cumulative probability. Note that the above screen shot is for the Student's t distribution calculator.

Binomial Distribution

Put the number of Bernoulli trials into the n box and the probability of success into the p box. Press the "Probability" button to get the probability of "y" successes as well as the probability of 0 to "y" successes. Press the "y" button to get the maximum success range for a given probability. For example, if the given probability is .75 and the returned y value is 9, then the probability of obtaining 0 to 9 successes is at least 75% (discrete distribution).

Poisson Distribution

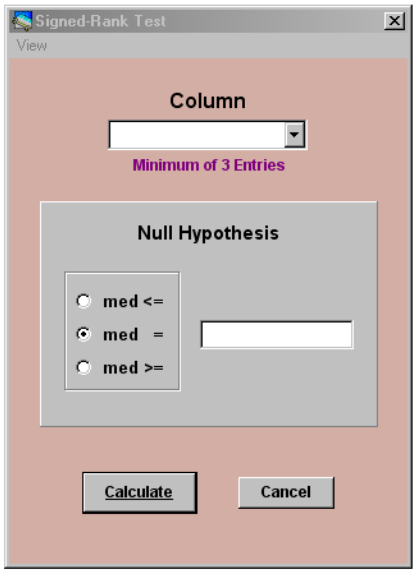
Type the parameter value into the lambda ("λ") edit box and type the random variable's value into the "x" edit box. Press the "Probability" button to get the probability of X=x as well as the probability of X<=x. Press the "x" button to get the smallest value of X for a given cumulative probability (the distribution is discrete). For example, if the parameter is 4.5 and the given cumulative probability is .75 then the smallest value of X with a cumulative probability of 75% is 6.

Bivariate Standard Normal Distribution

This function calculates the joint probability for intervals of two jointly distributed, standard normal random variables. Press the "Probability" button to get the joint probability. Note that you can set the correlation between the two random variables (rho). The default correlation is 0.

## Tests, the Input Windows for Hypothesis Testing

For each of the statistical tests listed under the menubar item **Tests** the program provides a p-value calculator which you access through small, hypothesis testing windows. The small, hypothesis testing windows open in response to your menubar selection. You input data through the white edit boxes and drop-down list boxes on the hypothesis testing windows. The list boxes allow you to select the sample variable values which you store in columns on the data worksheet. You select the type of null hypothesis (greater than, equal to, or less than) with radio buttons. Output appears in the large results window after you press the "Calculate" button. Following is an example of a hypothesis test input window (the signed-rank test for medians).




1-Sample t-Test

Select the column that has the sample data and then establish the null hypothesis (mean less than, greater than, or equal to a given value). The program calculates and displays the sample mean, test statistic value, and p-value. If the Show Confidence Intervals box is checked then the program will also calculate and display the 90%, 95%, and 99% confidence intervals for the mean.

1-Sample Sign Test

Select the column that has the sample data and then establish the null hypothesis (median less than, greater than, or equal to a given value). The program calculates and displays the sample median, test statistic value, and p-value. If the Show Confidence Interval box is checked then the program will also calculate and display the approximate 95% confidence interval for the median.

For samples of size <= 50 the program uses the exact, binomial distribution to calculate p-values and the approximate 95% confidence interval. For samples of size > 50 the program uses the normal approximation of the binomial distribution to calculate p-values and the Hollander & Wolfe method to calculate the approximate 95% confidence interval.

1-Sample Signed-Rank Test

Select the column that has the sample data and then establish the null hypothesis (median less than, greater than, or equal to a given value). The program calculates and displays the sample median, number of non-median observations, number of tied ranks, test statistic value, and p-value. The test statistic is Wilcoxon's SR estimate. The calculation ignores sample values equal to the test median.

If the number of observations is greater than 20 the program uses the normal approximation of the discrete SR distribution to obtain p-values (variance adjusted for ties). If there are 20 or fewer observations the program obtains p-values through a table of calculated SR probabilities loaded from the file srtable.txt.

1-Sample Johnson's t-Test

This modified t Test should only be used on data from skewed distributions. If your sample indicates a symmetric distribution then use the regular t test or a non-parametric test.

Select the column that has the sample data and then establish the null hypothesis (mean less than, greater than, or equal to a given value). The program calculates and displays the sample mean, test statistic value, and p-value. If the Show Confidence Intervals box is checked then the program will also calculate and display the 90%, 95%, and 99% confidence intervals for the mean.

2-Sample t-Test

Select the columns that have the sample data (each column is a separate random variable). Establish the null hypothesis (mean of X = mean of Y, mean of X >= mean of Y, mean of X <= mean of Y, mean of X - mean of Y equals a given value). The program calculates and displays the sample means, test statistic value, and p-value. If the Show Confidence Intervals box is checked then the program will also calculate and display the 90%, 95%, and 99% confidence intervals for the mean of X - mean of Y.

For this test the two random variables should have the same variance (pooled variance used in calculation of the t statistic).

Welch's t-Test (2-sample)

Select the columns that have the sample data (each column is a separate random variable). Establish the null hypothesis (mean of X = mean of Y, mean of X >= mean of Y, mean of X <= mean of Y, mean of X - mean of Y equals a given value). The program calculates and displays the sample means, test statistic value, and p-value. If the Show Confidence Intervals box is checked then the program will also calculate and display the 90%, 95%, and 99% confidence intervals for the mean of X - mean of Y.

For this test the two random variables should have the different variances (the test statistic is Welch's T, which utilizes the calculation of separate variances).

Mann-Whitney Test (2-sample)

Select the columns that have the sample data (each column is a separate random variable). Establish the null hypothesis (median of X = median of Y, median of X >= median of Y, median of X

<= median of Y). The program calculates and displays the sample medians, U statistic for equal medians, test statistic values (Mann-Whitney u and the Wilcoxon r_x), and p-value.

If both samples contain fewer than 11 observations then the program obtains p-values through a table of calculated U probabilities loaded from the file mwtable.txt; otherwise the program obtains p-values through the traditional, normal approximation method. Note that the program's normal approximation algorithm uses a continuity correction.

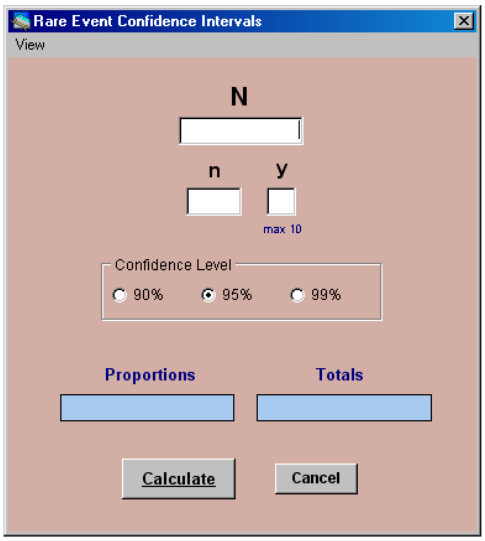
Median Test (2-sample)

The program uses the chi-squared approximation to Fischer's Exact Test and requires that each sample contains at least 10 observations.

Select the columns that have the sample data (each column is a separate random variable). Establish the null hypothesis (median of X = median of Y, median of X >= median of Y, median of X <= median of Y). The program calculates and displays the sample medians, test statistic value, and p-value.

## Rare, the Rare Event Sampling Calculators

These calculators are useful in survey sampling when the subject of interest is a rare event. You access the calculators through small windows which open in response to your rare event menubar selection. You input data through the edit boxes on the small rare event calculator windows. The output appears in the output edit boxes (light blue) of the rare event calculator windows. Following is screen shot of one of the two rare event calculators.




Rare Event Confidence Intervals

Enter the population size in the N edit box, sample size in the n edit box, and the number of successes in the y edit box. Sample size may not exceed 20% of the population. Sample proportion

may not exceed 10% of the sample. The number of successes may not exceed 10. You may enter 0 successes.

The program calculates the confidence interval for the population proportion and the population "successes" using the Chi-Squared Distribution as an approximation of the Binomial Distribution.

Rare Events – 0 Successes

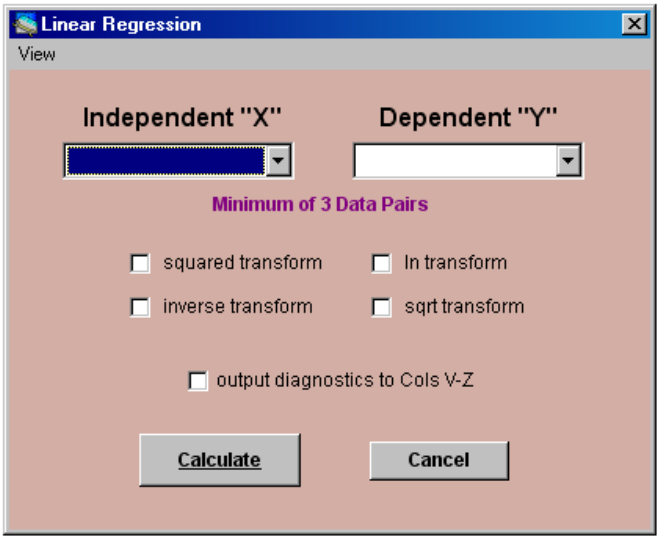
Enter the population size in the N edit box and the sample size in the n edit box. Sample size may not exceed 20% of the population. Note that the number of successes in the sample (positive events) is 0.

Mid-Interval Output: The program calculates the confidence interval using the Chi-Squared Distribution as an approximation of the Binomial Distribution. Point estimates are the mid-points of the confidence intervals.

50% Confidence Output: The program calculates the point estimate using the Chi-Squared Distribution, probability of 50%, 2 degrees of freedom. The resulting quantile is divided by 2*n to obtain the estimated population proportion.

## Analysis, the Input Windows for Regression, Categorical Data Analysis, and ANOVA

The analysis functions take input from the data worksheet and place output into the results window. Generally, each row in the data worksheet represents an observation while each column represents a variable. You use the functions by selection of one or more columns from the data worksheet. Following is an example of an analysis window.



### Regression Analysis Options

Linear Correlation Coefficient

The program calculates Pearson's rho estimator for a linear relationship.

Rank Correlation Coefficient

The program calculates Spearman's rank correlation coefficient for a non-linear relationship.

Regression Analysis

Simple Linear Regression: Straight line fit for 1 independent variable.
Curve Fit: Quadratic and cubic fits for 1 independent variable.
Multiple Regression: Straight line fit for 2 to 4 independent variables.

The program performs a least squares fit through use of the SVD algorithm. Output consists of the constant and coefficient estimates with t statistics and p-values; the F-statistic and its p-value; coefficient of determination; and the mean square error. Available Y transforms are inverse, square root, lognormal, and squared. Diagnostics that can be displayed in the data worksheet are predicted values, residuals, Studentized residuals, DF Fits values and the "hat" matrix diagonal values. Note that the display of the diagnostics will overwrite any data in last five data worksheet columns

### Categorical Data Analysis Options

1-Factor Proportions

The program performs Pearson's chi-squared test of proportions. You enter distribution proportions in decimal format and such proportions must total to 1.0. The program calculates the p-value for both df = # of categories - 1 (actual distribution) and df = # of categories - 2 (estimated distribution).

2-Factor Independence

The program performs the Chi-squared test of independence for 2 factors represented in an n x n table. Ex: Rows represent religion while columns represent political affiliation.

Factor Effect, 2x2 Table

The data worksheet must have success counts in one column and failure counts in another column. Null hypotheses that can you can test are Row1 Success Rate = Row2 Success Rate, Row1 Success Rate <= Row2 Success Rate, and Row1 Success Rate >= Row 2 Success Rate.

2x2xK Tables

The data worksheet must have success counts in one column and failure counts in another column. Each pair of rows is a stratum. Rows 1 and 2 make up the first partial table (Stratum 1), rows 3 and 4 make up the second partial table (Stratum 2), *etc.* The program calculates odds ratios as (n_11

x n_22) / (n_12 x n_21) as well as the inverse. Also, the program calculates "corrected" odds ratios (.5 added to each cell count) and such odds ratios appear in the results window as "Odds Ratio_C." The conditional independence test is based on the chi-square distribution of the Cochran-Mantel-Haenszel Statistic. The overall odds ratio is the Mantel-Haenszel Odds Ratio Estimator. The homogeneity test is based on the chi-square distribution of the Breslow-Day Statistic.

#### ANOVA (analysis of variance)

1-Way ANOVA

Each column that you select is a factor or level of a factor. Minimum of 3 columns and 2 observations per column.

2-Way ANOVA, 1 Observation per Cell

Each row is a level of Factor A, while each column is a level of Factor B. Minimum of 2 columns and 3 rows.

2-Way ANOVA, Balanced

Each column that you select is a level of Factor B, each row is an observation. Rows are grouped sequentially into levels of Factor A by n, the number of observations per "cell." For example, if you have 3 levels of Factor B, 20 rows of data, and 5 observations per A/B intersection, then rows 1-5 are Level 1 of Factor A, rows 6-10 are Level 2 of Factor A, rows 11-15 are Level 3 of Factor A, and rows 16-20 are Level 4 of Factor A.

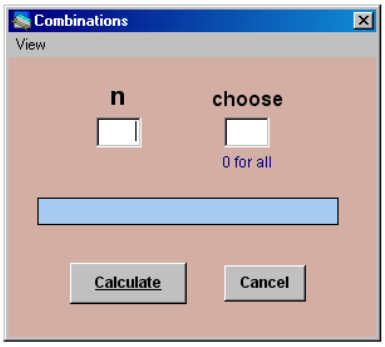
Friedman's Rank Test

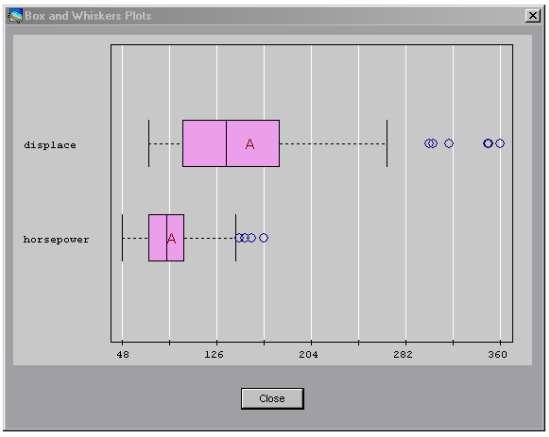
If the number of rows(columns) = 3 and the number of columns(rows) < 14 or the number of rows(columns) = 4 and the number of columns(rows) < 9 or the number of rows(columns) = 3 and the number of columns(rows) < 6 then the program obtains p-values through a table of calculated rank probabilities loaded from the file frtable.txt; otherwise the program obtains p-values by chi-squared approximation.

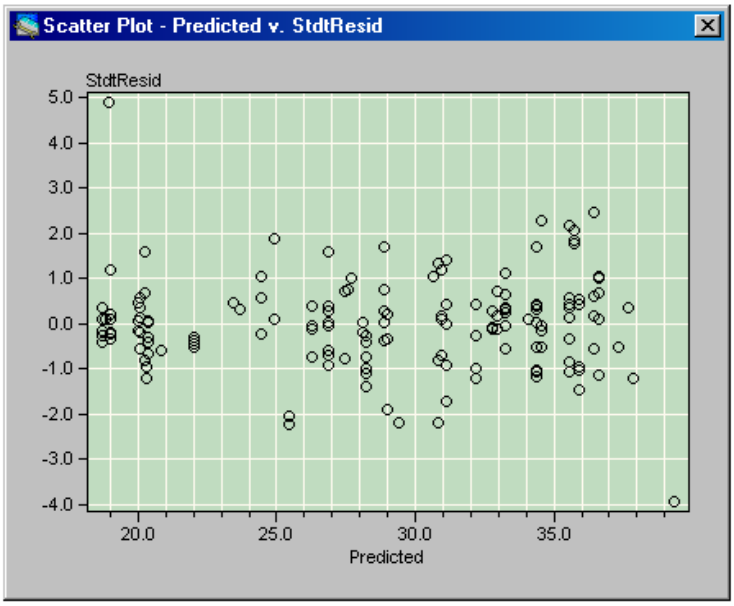
## Other Program Functions

The **Other** menubar selection provides access to the descriptive statistics calculator for univariate data, two counting calculators (combinations and permutations) a normal random number generator, and four plotting functions (box and whiskers, probit or normal quantile, symmetry, and scatter). You may save a plot to a bitmap file (.bmp) by right clicking when the mouse cursor is on the plot window.

Following are examples of the combinations calculator window, a box and whiskers plot, and a scatter plot.



Descriptive Statistics

Displays in the Results Window the following statistics for a column of sample data: Mean, Sample Size, Median, Interquartile Range, Range, Sample Variance, Sample Standard Deviation, Sample Skewness, and Sample Kurtosis.

Combinations

A combinations calculator, "n choose r". If the size of the subset r is 0 then all possible combinations are calculated (size 1 through n).

Permutations

A permutations calculator, "n choose r". If you enter 0 for r then n! is calculated.

Normal Random Numbers

The program can generate up to 3,000 random numbers from a normal distribution. Results are placed into the data worksheet starting at the first available column from the right. You may set the distribution parameters (mean and standard deviation).

Probit Plot

This is the normal Q-Q plot of the data in the selected column. Data values (quantiles) are on the x-axis, while cumulative probability values (Z scores) are on the y-axis. Accordingly, right tail data points below the "straight line" indicate heavy/thick tails while right tail data points above the "straight line" indicate light/thin tails. To save the plot to a bitmap file right-click on the graphics window and name the file. The extension .bmp is added automatically.

Symmetry Plot

This is a plot of distances from the median with values greater than the median plotted on the x-axis and values less than the median plotted on the y-axis. Accordingly, data points that form a line above the x=y line indicate a negative skew while data points that form a line below the x=y line indicate a positive skew. To save the plot to a bitmap file right-click on the graphics window and name the file. The extension .bmp is added automatically.

Box and Whiskers Plots

The program draws Tukey-style box and whiskers plots of univariate data. The left side of the box is at the 25%ile; the right side of the box is at the 75%ile. The left whisker is at the smallest value within 1.5 interquartile range lengths from the left edge of the box. The right whisker is at the largest value within 1.5 interquartile range lengths from the right edge of the box. Circles outside of the whiskers represent possible outliers. The median is indicated by a vertical black line within the box. The mean is represented by the red letter A (apex at the mean value).

Labels are truncated to the first 12 characters for a Windows system font of 100 dpi or less. For larger system fonts the labels are truncated to the first 11 characters.

To save the plot to a bitmap file right-click on the graphics window and name the file. The program automatically adds the file extension .bmp.

Scatter Plot

The program draws a scatter plot of bivariate data (two columns from the data worksheet). Axes are not necessarily of the same scale. Left-click on a plot marker once or twice and the observation number, x axis value, and y-axis value will display momentarily. To save the plot to a bitmap file right-click on the graphics window and name the file. The program automatically adds the file extension .bmp.