StatCrunch Technology Step-by-Step

Section 1.3 Obtaining a Simple Random Sample

1. Select **Data**, highlight **Simulate**, and then highlight **Discrete Uniform**.
2. Fill in the window with the appropriate values. To obtain a simple random sample for the situation in Example 2, enter the values shown in the figure below. The reason we generate 10 rows of data (instead of 5) is in case any of the random numbers repeat. Click Compute! and the random numbers will appear in the spreadsheet. *Note*: You could also select the single dynamic seed radio button to set the seed.

Section 2.1 Organizing Qualitative Data

Frequency and Relative Frequency Distributions from Raw Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Stat**, highlight **Tables**, and select **Frequency**.
3. Click on the variable you wish to summarize. Click the Type of table you want. If you want both Frequency and Relative Frequency, highlight Frequency, then press Ctrl (or Command on an Apple) and select Relative frequency. Click Compute!.

Bar Graphs from Summarized Data

1. If necessary, enter the summarized data into the spreadsheet. Name the variable and frequency (or relative frequency) columns.
2. Select **Graph**, highlight **Bar Plot**, then highlight **with summary**.
3. Select the "Categories in:" variable and "Counts in:" variable. Choose the type of bar graph (frequency

or relative frequency). Enter labels for the X-axis and Y-axis. Enter a title for the graph. Click Compute!. NOTE: If you want to display the frequency or relative frequency for each category on the graph, check the box "Value above bar".

Bar Graphs from Raw Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph**, highlight **Bar Plot**, then highlight **with data**.
3. Click on the column name of the variable you wish to summarize. Leave the grouping option as "Split bars". Choose the type of bar graph (frequency or relative frequency). Enter labels for the X-axis and Y-axis. Enter a title for the graph. Click Compute!. NOTE: If you want to display the frequency or relative frequency for each category on the graph, check the box "Value above bar".

Side-by-Side Bar Graphs from Summarized Data

1. If necessary, enter the summarized data into the spreadsheet. Name the columns.
2. Select **Graph**, highlight **Chart**, then highlight **columns**.
3. Select the column variables that contain the frequency or relative frequency of each category. Select the column of the variable that has the row labels. Choose the display you would like (vertical or horizontal split bars). Click Compute!.

Pie Chart from Summarized Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph**, highlight **Pie Chart**, then highlight **with summary**.
3. Select the "Categories in:" variable and "Counts in:" variable. Choose the display you would like. Enter a title for the graph. Click Compute!.

Pie Chart from Raw Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph**, highlight **Pie Chart**, then highlight **with data**.
3. Click on the column name of the variable you wish to summarize. Choose the display you would like. Enter a title for the graph. Click Compute!.

Section 2.2 Organizing Quantitative Data: The Popular Displays

Frequency and Relative Frequency Distributions of Discrete Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Stat**, highlight **Tables**, and select **Frequency**.
3. Click on the variable you wish to summarize. Click the Type of table you want. If you want both Frequency and Relative Frequency, highlight Frequency, then press Ctrl (or Command on an Apple) and select Relative frequency. Click Compute!.

Frequency or Relative Frequency Distributions of Continuous Data

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Data** and highlight **Bin**.

3. Click the variable you wish to summarize. Click the "Use fixed width bins" radio button. Enter the lower class limit of the first class in the "Bins:Start at:" cell. Enter the class width in the "Bins: Width:" cell. Leave the "Include left endpoint" radio button selected. Click Compute!.
4. Select Stat and highlight Tables, then Frequency.
5. Click the Bin(column name) variable. Under Type:, select Frequency and Relative Frequency. Click Compute!

Histograms

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph** and highlight **Histogram**.
3. Click on the variable you wish to summarize. Choose the type of histogram (frequency or relative frequency). You have the option of choosing a lower class limit for the first class by entering a value in the cell marked "Bins: Start at:" You have the option of choosing a class width by entering a value in the cell marked "Bins: Width:" Enter labels for the X-axis and Y-axis. Enter a title for the graph. Click Compute!.NOTE: If you want to display the frequency or relative frequency for each category on the graph, check the box "Value above bar".

Dot Plots

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph** and highlight **Dotplot**.
3. Click on the variable you wish to summarize. Enter labels for the X-axis and Y-axis. Enter a title for the graph. Click Compute!.

Section 2.3 Additional Displays of Quantitative Data

Stem-and-Leaf Plots

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph** and highlight **Stem and Leaf**.
3. Click on the variable you wish to summarize. Select None for outlier trimming. Click Compute!.

Frequency and Relative Frequency Polygons

1. Enter class midpoints in var1 and frequency or relative frequency in var2. Title the columns. Enter a class midpoint one class below the first class midpoint with a frequency or relative frequency of 0. Also, enter a class midpoint one class above last class midpoint with a frequency or relative frequency of 0.
2. Select **Graph** and highlight **Scatter Plot**.
3. The class midpoints are the X column. The frequency or relative frequency is the Y column. Highlight "Points and Lines" in the Display window. Label the axes and title the graph. Click Compute!.

Ogives

1. Enter upper class limits in var1 and cumulative frequency or cumulative relative frequency in var2. Be sure to enter the upper class limit of the class that would precede the first class along with a cumulative frequency or cumulative relative frequency of 0. Name the columns.
2. Select **Graph** and highlight **Scatter Plot**.

3. The upper class limits is the X column. The cumulative frequency or cumulative relative frequency is the Y column. Highlight "Points and Lines" in the Display window. Label the axes and title the graph. Click Compute!.

Times Series Plots

1. Enter the time (such as year) in var1 and value of the variable in var2. Name the columns.
2. Select **Graph** and highlight **Scatter Plot**.
3. Time is the X column. Each observation is entered in the Y column. Highlight "Points and Lines" in the Display window. Label the axes and title the graph. Click Compute!.

Section 3.1 Measures of Central Tendency

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Stat**, highlight **Summary Stats,** and select **Columns**.
3. Click on the variable you wish to summarize. Deselect any statistics you do not wish to compute by clicking on the statistic. If you wish to compute certain statistics hold down the Ctrl (or Command on an Apple) key when selecting the statistic. Click Compute!.

Section 3.2 Measures of Dispersion

Follow the same steps followed to obtain the measures of central tendency.

Section 3.3 Measures of Central Tendency & Dispersion from Grouped Data

Mean/Standard Deviation

1. If necessary, enter the summarized data into the spreadsheet. Name the columns.
2. Select **Stat**, highlight **Summary Stats**, and select **Grouped/Binned data**.
3. Choose the column that contains the class under the "Bins in:" drop-down menu. Choose the column that contains the frequencies in the "Counts in:" drop-down menu. Select the "Consecutive lower limits" radio button for defining the midpoints. Click Compute!.

Weighted Mean
1. Enter the value of the variable in the first column and the weights in the second column. Name the columns.
2. Select **Stat**, highlight **Calculators**, and select **Custom**.
3. Choose the column that contains the value of the variable under the "Values in:" drop-down menu. Choose the column that contains the weights in the "Weights in:" drop-down menu. Click Compute!.

Section 3.4 Measures of Position and Outliers

Determining Quartiles

Follow the same steps followed to obtain the measures of central tendency.

Section 3.5 The Five-Number Summary and Boxplots

Drawing Boxplots

1. If necessary, enter the raw data into the spreadsheet. Name the column variable.
2. Select **Graph** and highlight **Boxplot**.
3. Click on the variable whose boxplot you want to draw. If you wish to draw side-by-side boxplots, hold the Control key down while clicking the variable. Check the boxes "Use fences to identify outliers" and "Draw boxes horizontally".   Enter label for the X-axis. Enter a title for the graph. Click Compute!.

Section 4.1 Scatter Diagrams and Correlation

Scatter Diagrams

1. If necessary, enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Graph** and highlight **Scatter Plot**.
3. Choose the explanatory variable for the X column and the response variable for the Y column. Enter the labels for the X-axis and Y-axis. Enter a title for the graph. Click Compute!.

Correlation Coefficient

1. If necessary, enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Stat**, highlight **Summary Stats**, and select **Correlation**.
3. Click on the variables whose correlation you wish to determine. Click Compute!.

Section 4.2 Least-Squares Regression

Determining the Least-Squares Regression Line

1. If necessary, enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Stat**, highlight **Regression**, and select **Simple Linear**.
3. Choose the explanatory variable for the X variable and the response variable for the Y variable. If you want, enter a value of the explanatory variable to Predict Y for X. If you want the least-squares regression line drawn on the scatter diagram, highlight Fitted line plot under Graphs. Click Compute!.

Section 4.3 Diagnostics on the Least-Squares Regression Line

The Coefficient of Determination, R^2

Follow the same steps used to obtain the least-squares regression line. The coefficient of determination is given as part of the output (R-sq).

Residual Plots

1. If necessary, enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.

2. Select **Stat**, highlight **Regression**, and select **Simple Linear**.

3. Choose the explanatory variable for the X variable and the response variable for the Y variable. Under Graphs, select Residuals vs. X-values. Click Compute!. NOTE: You also have the option of storing residuals in the StatCrunch spreadsheet under "Save:".

Section 4.4 Contingency Tables and Association

Determining Marginal and Conditional Distributions

1. Enter the contingency table into the spreadsheet. The first column should be the row variable. For example, for the data in Table 9, the first column would be employment status. Each subsequent column would be the counts of each category of the column variable. For the data in Table 9, enter the counts for each level of education. Title each column (including the first column indicating the row variable).

2. Select **Stat**, highlight **Tables**, select **Contingency**, then highlight **with summary**.

3. Select the column variables. Then select the label of the row variable. For example, the data in Table 9 has four column variables (Did Not Finish High School, and so on) and the row label is employment status. Decide what values you want displayed. Typically, we choose row percent and column percent for this section. Click Compute!.

Drawing Stacked Bar Graphs of Conditional Distributions

1. Select Applets, highlight Contingency Table.

2. Under Row labels, enter the values of the variables in the rows of the contingency table. Under Column labels, enter the values of the variables in the columns of the contingency table. For the data in Table 9, enter the labels as shown below. Click Compute!

3. Enter the counts in the contingency table. If you want the conditional distribution by the row variable, select "Row distribution." If you want the conditional distribution by the column variable, select "Column distribution."

Section 5.6 Simulation

Random Integers

1. Select Data > Simulate > Discrete Uniform.
2. Enter the number of rows and columns desired. Enter the Minimum and Maximum values of the parameters (such as 1 and 6 for a 6-sided die). Click Compute!.

Computing Expressions in StatCrunch

1. Select Data > Compute > Expression.
2. Click Build.
3. Build the expression using the features available. For example, if column 1 is named "Die1" and column 2 is named "Die2", we could compute "Die1" + "Die2".   If we want to decide if Die1 is greater than Die2, we could compute "ifelse(Die1>Die2,True,False)".

Section 6.1 Discrete Random Variables

Finding the Mean and Standard Deviation of a Discrete Random Variable

1. Enter the values of the random variable in column var1 and the corresponding probabilities in column var2. Name var1 x and var2 $P(x)$.
2. Select **Stat**, **Calculators**, **Custom**. Select x for "Values in:";. Select $P(x)$ for "Weights in:". Click Compute!.

Section 6.2 The Binomial Probability Distribution

Computing Binomial Probabilities

1. Select **Stat**, highlight **Calculators**, select **Binomial**.
2. Enter the number of trials, n, and probability of success, p. In the pull-down menu, decide if you wish to compute $P(X \leq x)$, $P(X < x)$, and so on. Finally, enter the value of x. Click Compute.

Section 6.3 The Poisson Probability Distribution

Computing Binomial Probabilities

1. Select **Stat**, highlight **Calculators**, select **Poisson**.
2. Enter the mean, μ. In the pull-down menu, decide if you wish to compute $P(X \leq x)$, $P(X < x)$, and so on. Finally, enter the value of x. Click Compute.

Section 7.2 Applications of the Normal Distribution

Finding Areas Under the Standard Normal Curve

1. Select **Stat**, highlight **Calculators**, select **Normal**.
2. Enter the mean and the standard deviation. In the pull-down menu, decide if you wish to compute $P(X \leq x)$ or $P(X \geq x)$. Finally, enter the value of x. Click Compute.

Finding Scores Corresponding to an Area

1. Select **Stat**, highlight **Calculators**, select **Normal**.
2. Enter the mean and the standard deviation. In the pull-down menu, decide if you are given the area to the left of the unknown score or the area to the right. If given the area to the left, in the pull-down menu choose the $\leq$ option; if given the area to the right, choose the $\geq$ option. Finally, enter the area in the right-most cell. Click Compute.

Section 7.3 Assessing Normality

Normal Probability Plots

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Graph,** highlight **QQ Plot**.
3. Select the variable. Check the box to add the correlation statistic. Click Compute!.

Section 9.1 Estimating a Population Proportion

Confidence Intervals

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **Proportion Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Values in:" drop-down menu. Enter the value that represents a success. If you chose **With Summary,** enter the number of successes and the number of observations. Choose the confidence interval radio button. Enter the level of confidence. Leave the method as "Standard-Wald". Click Compute!.

Determining Sample Size

1. Select **Stat**, highlight **Proportion Stats,** highlight **One Sample,** highlight **Power/Sample size**.
2. Click on the "Confidence Interval Width" tab. Enter the Confidence level. For the target proportion, enter the estimate of $\hat{p}$ or enter 0.5 if there is no prior estimate of p. The width is the difference between the lower bound and upper bound in the confidence interval. Therefore, the width is two times the margin of error. Clear any entry in the sample size cell. Click Compute.

Section 9.2 Estimating a Population Mean

Confidence Intervals

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **T Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Select column(s):" drop-down menu. If you chose **With Summary**, enter the sample mean, sample standard

deviation, and sample size. Choose the confidence interval radio button. Enter the level of confidence. Click Compute!.

Determining Sample Size

1. Select **Stat**, highlight **Z Stats** or **T Stats,** highlight **One Sample,** highlight **Power/Sample size**.
2. Click on the "Confidence Interval Width" tab. Enter the Confidence level and standard deviation. The width is the difference between the lower bound and upper bound in the confidence interval. Therefore, the width is two times the margin of error. Clear any entry in the sample size cell. Click Compute.

Section 9.3 Estimating a Population Standard Deviation

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **Variance Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Select column(s):" drop-down menu. If you chose **With Summary**, enter the sample variance and sample size. Choose the confidence interval radio button. Enter the level of confidence. Click Compute!.

Section 10.2 Hypothesis Tests for a Population Proportion

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **Proportion Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Values in:" drop-down menu. Enter the value that represents a success. If you chose **With Summary,** enter the number of successes and the number of observations.   Choose the hypothesis test radio button. Enter the value of the proportion stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu.   Click Compute!.

Section 10.3 Hypothesis Tests for a Population Mean

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **T Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Select column(s):" drop-down menu. If you chose **With Summary**, enter the sample mean, sample standard deviation, and sample size. Choose the hypothesis test radio button. Enter the value of the mean stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. Click Compute!.

Section 10.4 Hypothesis Tests for a Population Standard Deviation

1. If necessary, enter the raw data into column var1. Name the column.
2. Select **Stat**, highlight **Variance Stats,** highlight **One Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.

3. If you chose **With Data**, highlight the column that contains the data in the "Select column(s):" drop-down menu. If you chose **With Summary**, enter the sample variance and sample size. Choose the hypothesis test radio button. Enter the value of the variance stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. Click Compute!.

Section 11.1 Inference about Two Population Proportions

Inference about Two Population Proportions

1. If necessary, enter the raw data into columns var1 and var2. Name the columns.
2. Select **Stat**, highlight **Proportion Stats,** highlight **Two Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Values in:" drop-down menu for Sample 1 and Sample 2. Enter the value that represents a success within each sample. If you chose **With Summary,** enter the number of successes and the number of observations for each sample. If you choose the hypothesis test radio button, enter the value of the proportion stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. If you choose the confidence interval radio button, enter the level of confidence. Click Compute!.

Determining Sample Size

1. Select **Stat**, highlight **Proportion Stats,** highlight **Two Sample,** highlight **Power/Sample size**.
2. Click on the "Confidence Interval Width" tab. Enter the Confidence level. For the First and Second proportion, enter the estimate of the proportion for each sample, or enter 0.5 if there is no prior estimate of p. The width is the difference between the lower bound and upper bound in the confidence interval. Therefore, the width is two times the margin of error. Clear any entry in the sample size per group cell. Click Compute.

Section 11.2 Inference about Two Means: Dependent Samples

1. If necessary, enter the raw data into columns var1 and var2. Name the columns. If you have summarized data, follow the procedure for confidence intervals or hypothesis tests on a single mean with summarized data.
2. If you entered raw data, select **Stat**, highlight **T Stats,** highlight **Paired.**
3. Highlight the column that contains sample 1 from the drop-down menu. Highlight the column that contains sample 2 from the drop-down menu. If you choose the hypothesis test radio button, enter the value of the mean stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. If you choose the confidence interval radio button, enter the level of confidence. Click Compute!.

Section 11.3 Inference about Two Means: Independent Samples

1. If necessary, enter the raw data into columns var1 and var2. Name the columns.
2. Select **Stat**, highlight **T Stats,** highlight **Two Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.

3. If you chose **With Data**, highlight the column that contains the data in the "Values in:" drop-down menu for Sample 1 and Sample 2. If you chose **With Summary**, enter the sample mean, sample standard deviation, and sample size for each sample. Uncheck the Pool variances box. If you choose the hypothesis test radio button, enter the value of the mean stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. If you choose the confidence interval radio button, enter the level of confidence. Click Compute!.

Section 11.4 Inference about Two Population Standard Deviations

1. If necessary, enter the raw data into columns var1 and var2. Name the columns.
2. Select **Stat**, highlight **Variance Stats,** highlight **Two Sample.** Choose **With Data** if you have raw data, choose **With Summary** if you have summarized data.
3. If you chose **With Data**, highlight the column that contains the data in the "Values in:" drop-down menu for Sample 1 and Sample 2. If you chose **With Summary**, enter the sample variance and sample size for each sample. If you choose the hypothesis test radio button, enter the value of the ratio of the population variances stated in the null hypothesis and choose the direction of the alternative hypothesis from the drop-down menu. If you choose the confidence interval radio button, enter the level of confidence. Click Compute!.

Section 12.1 Goodness-of-Fit Test

1. Enter the observed counts in the first column. Enter the expected counts in the second column. Name the columns observed and expected.
2. Select **Stat**, highlight **Goodness-of-fit**, then highlight **Chi-Square test**.
3. Select the column that contains the observed counts and select the column that contains the expected counts. Click Compute!.

Section 12.2 Tests for Independence and the Homogeneity of Proportions

1. If the data are already in a contingency table, enter them into the spreadsheet. The first column is the row variable. For example, for the data in Table 5, the first column is level of happiness. Each subsequent column is the counts of each category of the column variable. For the data in Table 5, enter the counts for each marital status. Title each column (including the first column indicating the row variable). If the data are not in a contingency table, enter each variable in a column and name the column variable.
2. Select **Stat**, highlight **Tables**, highlight **Contingency**, then select **With Data** or **With Summary**.
3. If you chose **With Data**, select the column that contains the row variable and select the column that contains the column variable. If you chose **With Summary,** select the column variables. Then select the column that contains the row labels. Decide what values you want displayed. Choose the Chi-square test for independence under the Hypothesis tests menu. Click Compute!.

Section 13.1 Comparing Three or More Means (One-Way Analysis of Variance)

1. Either enter the raw data in separate columns for each sample or treatment, or enter the value of the variable in a single column with indicator variables for each sample or treatment in a second column.

2. Select **Stat**, highlight **ANOVA**, and select **One Way**.
3. If the raw data are in separate columns, select "Selected columns" and then click the columns you wish to compare. If the raw data are in a single column, the select "Values in a single column" and then choose the column that contains the value of the variables and the column that indicates the sample or treatment. Click Compute!.

Section 13.2 Post-Hoc Tests on One-Way Analysis of Variance

1. Repeat the steps for conducting a one-way analysis of variance. In Step 3, check the box "Compute Tukey HSD". Choose the level of confidence. Click Compute!.

Section 13.3 The Randomized Complete Block Design

1. In column var1, enter the block of the response variable; in column var2, enter the treatment of the response variable; and in column var3, enter the value of the response variable. Name the columns.
2. Select **Stat**, highlight **ANOVA**, and select **Repeated Measures ANOVA**.
3. Select the column containing the values of the response variable from the drop-down menu "Responses in:". Select the column containing the treatments from the drop-down menu "Treatments in:". Select the column containing the blocks in the drop-down menu "Blocks in:". Check the box "Compute Tukey HSD" Click Compute!.

Section 13.4 Two-Way Analysis of Variance

Obtaining Two-Way ANOVA & Interaction Plots

1. In column var1, enter the level of factor A; in column var2, enter the level of factor B; and in column var3, enter the value of the response variable. Name the columns.
2. Select **Stat**, highlight **ANOVA**, and select **Two Way**.
3. Select the column containing the values of the response variable from the drop-down menu "Responses in:". Select the column containing the row factor from the drop-down menu "Row factor in:". Select the column containing the column factor in the drop-down menu "Column factor in:". Check the box "Compute Tukey HSD" to use for Tukey's test. If you want interaction plots, check the "Plot interactions" box. Click Compute!.

Section 14.1 Testing the Significance of the Least-Squares Regression Model

Hypothesis Test on the Slope

1. Enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Stat**, highlight **Regression**, and select **Simple Linear**.
3. Choose the explanatory variable for the X variable and the response variable for the Y variable. Select the Hypothesis tests radio button. Choose the appropriate values in the null hypothesis for both the intercept and slope. Choose the direction of the alternative hypothesis from the drop-down menu. Click Compute!.

Confidence Interval for the Slope

1. Enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Stat**, highlight **Regression**, and select **Simple Linear**.
3. Choose the explanatory variable for the X variable and the response variable for the Y variable. Select the Confidence intervals radio button. Choose the confidence level. Click Compute!.

Section 14.2 Confidence and Prediction Intervals

1. If necessary, enter the explanatory variable in column var1 and the response variable in column var2. Name each column variable.
2. Select **Stat**, highlight **Regression**, and select **Simple Linear**.
3. Choose the explanatory variable for the X variable and the response variable for the Y variable. Enter a value of the explanatory variable to Predict Y for X. Enter the desired Prediction Level. Click Compute!.

Section 14.3 Multiple Regression

Correlation Matrix

1. Enter the explanatory variables and the response variable into the StatCrunch spreadsheet. Name each column variable.

2. Select **Stat**, highlight **Summary Stats**, highlight **Correlation**.
3. Click on the variables whose correlation you wish to determine from the "Select column(s) dialogue box. Click Compute!.

Determining the Multiple Regression Equation and Residual Plots

1. Enter the explanatory variables and the response variable into the StatCrunch spreadsheet. Name each column variable.
2. Select **Stat**, highlight **Regression**, and select **Multiple Linear**.
3. Choose the response variable for the Y variable and the explanatory variables for the X variables. Choose None for variable selection. Choose any options you wish. Click Compute!.

Prediction and Confidence Intervals

Enter the values of the explanatory variable in the spreadsheet. Leave the value of the response variable blank. Highlight "95% confidence interval for the mean response" and/or "95% confidence interval for individual prediction." Click Compute!.

Section 14.5 Polynomial Regression

1. Enter the explanatory and response variable into the spreadsheet.
2. Select **Stat**, highlight **Regression**, and select **Polynomial.**
3. Choose 2 for Poly Order; choose the explanatory variable for the X-variable; choose the response variable for the Y-variable.

4. Choose between Hypothesis Tests (and direction of alternative) or Confidence Intervals (and level of confidence).

5. Choose any other options you want. Click Compute!.

Section 14.6 Building a Regression Model

1. With the data in the spreadsheet, select **Stat**, highlight **Regression**, and select **Multiple Linear**.

2. Select the Y-variable (response variable) from the drop-down menu. Choose all explanatory variables as the X-variables.

3. Choose either Stepwise, Forward selection, or Backward elimination and enter the P-value to enter or P-value to leave (level of significance). Choose any additional output to save. Click Compute!.

Section 15.3 Inferences about Measures of Central Tendency

1. Enter the raw data into column var1. Name the column.

2. Select **Stat**, highlight **Nonparametrics**, select **Sign Test.**

3. Select the variable from the Select column(s): dialogue box. Enter the appropriate value of the median in the null hypothesis. Choose the correct alternative. Click Compute!.

Section 15.4 Inferences about the Difference between Two Medians: Dependent Samples

1. Enter the raw paired data into the first two columns. Name the columns.

2. Select **Stat**, highlight **Nonparametrics**, select **Wilcoxon Signed Ranks.** Select the Paired radio button. Select the first column for Sample 1; select the second column for Sample 2. Select the Hypothesis Test for median radio button. Enter the appropriate value of the median in the null hypothesis. Choose the correct alternative. NOTE: StatCrunch will compute the difference as "Sample 1 – Sample 2". Click Compute!.

Section 15.5 Inferences about the Difference between Two Medians: Independent Samples

1. Enter the raw data into the first two columns. Name the columns.

2. Select **Stat**, highlight **Nonparametrics**, select **Mann-Whitney.**

3. Choose the column for Sample 1 and the column for Sample 2. Enter the appropriate value of the median in the null hypothesis. Choose the correct alternative. Click Compute!.

Section 15.6 Spearman's Rank Correlation Test

1. Enter the raw data into the first two columns. Name the columns.

2. Select **Stat**, highlight **Nonparametrics**, select **Spearman's Correlation**.

3. Select the variables under consideration under "Select column(s)". Check the box "Two-sided P-value". Click Compute!.

Section 15.7 Kruskall-Wallis Test

1. Either enter the raw data in separate columns for each sample or treatment, or enter the value of the variable in a single column with indicator variables for each sample or treatment in a second column.

2. Select **Stat**, highlight **Nonparametrics**, select **Kruskall-Wallis.**

3. If the raw data are in separate columns, select "Selected columns" under Compare and then click the columns you wish to compare. If the raw data are in a single column, the select "Values in a single column" under Compare and then choose the column that contains the value of the variables and the column that indicates the factor or treatment. Leave the box "Adjust for ties" checked. Click Compute!.