

# StatCrunch Step-by-Step

(Source: *Statistics: Informed Decisions Using Data 6<sup>th</sup> Edition* by Sullivan III, Michael)

## Frequency, Relative Frequency Table

1. Enter data into the column.
2. Select Stat, and then highlight Tables.
3. Select a column with data you wish to compute.
4. Go to Statistics group and select Frequency or Relative Frequency, and click Compute!

## Histogram

1. Enter data into var1.
2. Select Graph and then highlight histogram.
3. Select Variable you want to create a histogram for.
4. Select Relative Frequency or Frequency and click Compute!

## Summary Stats (Mean, Variance, Standard Deviation, Min, Q1, Median, Q3, Max, Range, IQR)

1. Enter data into the column var1.
2. Select Stat, highlight Summary Stat, and select columns.
3. Select Column with data you wish to compute.
4. Go to Statistics group and select what you wish to compute and then click Compute!

## Boxplots

1. 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. 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!

## Scatter Diagrams

1. 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. 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 want to determine. Click Compute!

## Least-Squares Regression Line

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. 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!
4. Use to find **equation, slope, y-intercept, r-sq, correlation coefficient, and residuals**
5. To see graph, select the right arrow at bottom of the box

## Binomial Probability

1. Select Stat, highlight Calculators, select Binomial.
2. Enter the number of trials,  $n$ , and probability of success,  $p$ . If you want to compute  $P(X < x)$ ,  $P(X \leq x)$ ,  $P(X > x)$ , or  $P(X \geq x)$ , highlight the Standard tab. In the pull-down menu, decide if you want to compute  $P(X \leq x)$ ,  $P(X < x)$ , and so on. Finally, enter the value of  $x$ . If you want to compute  $P(a \leq X \leq b)$ , highlight the Between tab. Enter the values of  $a$  and  $b$ . Click Compute!

## Poisson Probability

1. Select Stat, highlight Calculators, select Poisson.
2. Enter the mean,  $\mu$ . Highlight the Standard tab. In the pull-down menu, decide if you want to compute  $P(X \leq x)$ ,  $P(X < x)$ , and so on. Finally, enter the value of  $x$ . If you want to compute  $P(a \leq X \leq b)$ , highlight the Between tab. Enter the values of  $a$  and  $b$ . Click Compute!

## Area under the Standard Normal Curve

1. Select Stat, highlight Calculators, select Normal.
2. Enter the mean and the standard deviation. If you want to compute  $P(X \leq x)$ ,  $P(X < x)$ , select the Standard tab. In the pull-down menu, select  $P(X \leq x)$  or  $P(X \geq x)$ . Enter the value of  $x$ . If you want to compute  $P(a \leq X \leq b)$ , select the Between tab. Enter the values of  $a$  and  $b$ . Click Compute!

### Scores Corresponding to an Area

1. Select Stat, highlight Calculators, select Normal.
2. Enter the mean and the standard deviation. Select the Standard tab. If you are given the area to the left of the unknown value, in the pull-down menu choose the  $\leq$  option; if given the area to the right, choose the  $\geq$  option. Enter the area in the right-most cell. Click Compute!

### Normal Probability Plots

1. Enter the raw data into column var1. Name the column.
2. Select Graph and highlight QQ Plot.
3. Select the variable. Check the box to add the correlation statistic. Check the "Normal quantiles on y-axis" box. Click Compute!

### Confidence Intervals for a Population Proportion

1. If you have raw data, enter the data into the spreadsheet. Name the column variable.
2. Select Stat, then Proportion Stats, then One Sample, and then choose either With Data or With Summary.
3. If you chose With Data, select the column that has the observations, choose which outcome represents a success. If you chose With Summary, enter the number of successes and the number of trials. Choose the confidence interval radio button. Enter the level of confidence. Leave the Method as the Standard-Wald. Click Compute!

### Determining Sample Size for a Population Proportion

1. Select Stat, then Proportion Stats, then One Sample, and then Power/Sample Size.
2. Click on the "Confidence Interval Width" tab. Enter the Confidence level. For the target proportion, enter  $\hat{p}$  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!

### Confidence Intervals for a Population Mean

1. If necessary, enter the raw data into column var1. Name the column.
2. Select Stat, highlight T Stats, then One Sample, and then choose either With Data or With Summary.
3. If you chose With Data, highlight the column that contains the data in "Select column(s):". 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 for a Population Mean**

1. Select Stat, highlight Z Stats, then One Sample, and then highlight Power/Sample Size. Note: You may also highlight T Stats and follow the same steps.
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!

### **Hypothesis Tests Regarding a Population Proportion**

1. If you have raw data, enter them into the spreadsheet. Name the column variable.
2. Select Stat, highlight Proportion Stats, select One Sample, and then choose either With Data or With Summary (mean and standard deviation).
3. If you chose With Data, select the column that has the observations, choose which outcome represents a success. If you chose With Summary, enter the number of successes and the number of trials in the observations box. 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 pull-down menu. Click Compute!
4. Will show the z-stat and p-value

### **Hypothesis Tests Regarding $\mu$**

1. If you have raw data, enter them into the spreadsheet. Name the column variable.
2. Select Stat, highlight T Stats, select One Sample, and then choose either With Data or With Summary (mean and standard deviation).
3. If you chose With Data, select the column that has the observations. If you chose With Summary, enter the mean, 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 pull-down menu. Click Compute!
4. Will show the t-stat and p-value.

### **Hypothesis Tests Regarding a Population Proportion Using the Normal Model**

1. If you have raw data, enter them into the spreadsheet. Name the column variable.
2. Select Stat, highlight Proportion Stats, select One Sample, and then choose either With Data or With Summary (mean and standard deviation).
3. If you chose With Data, select the column that has the observations, choose with outcome represents a success. If you chose With Summary, enter the number of successes and the number of trials in the observations box. 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 pull-down menu. Click Compute!