

## StatCrunch Reference Guide

[StatCrunch](#) is a web-based statistical software that can be used to perform statistical analysis. This handout includes instructions for performing several different calculations in StatCrunch. For assistance with navigating StatCrunch, [click here](#) to watch a video from the Academic Center for Excellence. The table of contents below lists the calculations that are covered.

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### Sorting Data

[Click here to watch a video tutorial.](#)

- Open the data set in StatCrunch, or type the data in a column of a blank StatCrunch sheet.
- Click on **Data** to open the drop-down menu.
- Select **Sort**.
- Choose columns to be sorted by selecting the name of the column from the list on the left. The selected columns will be highlighted and appear in the list on the right.
- Choose how the data should be sorted, either ascending or descending.
- Click **Compute!** The columns will be replaced with the newly sorted data.

### Finding Mean, Standard Deviation, and Five Number Summary

[Click here to watch a video tutorial from StatCrunch.](#)

- Open the data set in StatCrunch, or type the data in a column of a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Summary Stats** to open another drop-down and select **Column**.
- In the new Summary Stats window, select the name of the columns to be used in the calculation in the “Select column(s)” box. To select multiple columns, hold **shift** or **ctrl** while clicking.
- Choose the statistics that need to be calculated in the “Statistics” box. To select multiple statistics, hold **shift** or **ctrl** while clicking. The order in which the statistics are selected is the order they will be in in the final output table.
- Click **Compute!** A new window will open with the table of selected statistics.

### Creating a Frequency Table

[Click here to watch a video tutorial from StatCrunch.](#)

- Open the data set in StatCrunch, or type the data in a column of a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Tables**. Select **Frequency** from the second drop-down menu.
- Select the names of the columns of data that will be used in the frequency table in the “Select column(s)” box.
- Choose which statistics to include in the frequency table in the “Statistics” box. To select multiple statistics, hold **shift** or **ctrl** while clicking.
- To choose the size and starting value of the bins, check the box next to “Bin numerical values” and enter the starting number and bin width.
- Click **Compute!** A new window will open with the created frequency table. To add the data directly to the sheet and not in a separate window, check the box next to “Store in data table” at the bottom of the window before clicking **Compute!**

### Finding the Mean and Standard Deviation of a Frequency Table

[Click here to watch a video tutorial.](#)

- Open the frequency table in StatCrunch, or type the bins/midpoints in one column and the frequency for each bin in a second column.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Summary Stats** to open another drop-down and select **Grouped/Binned Data**.
- Select the column name of the bins under “Bins in” and the frequency column under “Counts in.”
- Choose the statistics that need to be calculated in the “Statistics” box. To select multiple statistics, hold **shift** or **ctrl** while clicking. The order the statistics are selected is the order they will be in in the final output table.
- Click **Compute!** A new window will open with the table of selected statistics.

### Creating a Histogram

[Click here to watch a video tutorial from StatCrunch.](#)

- Open the data set in StatCrunch, or type the data in a column of a blank StatCrunch sheet.
- Click **Graph** to open the drop-down menu.
- Select **Histogram**
- Select the column name of the data to be displayed in the histogram in the “Select column(s)” box. Selecting more than one column of data will add additional histograms to the output window.
- Under “Bins”, type in the desired start value and bin width.
- Add title and axis labels under “Graph Properties.”
- Click **Compute!** The histogram will appear in a new StatCrunch window.

### Creating a Boxplot

[Click here to watch a video tutorial from StatCrunch.](#)

- Open the data set in StatCrunch, or type the data in a column of a blank StatCrunch sheet.
- Click **Graph** to open the drop-down menu.
- Select **Boxplot**.
- Select the column name of the data to be displayed in the boxplot in the “Select column(s)” box. Selecting more than one column of data will add additional boxplots to the output window.
- Checking the “Use fences to identify outliers” box under “Other options” will create a modified boxplot that separates the outliers from the rest of the boxplot.
- If a horizontal boxplot is required, check the box next to “Draw boxes horizontally” under “Other options.”

- Add title and axis labels under “Graph Properties.”
- Click **Compute!** The boxplot will appear in a new StatCrunch window.

### **Finding the Mean and Standard Deviation for Probability Distribution**

[Click here to watch a video tutorial.](#)

- Open the probability distribution table in StatCrunch, or type the x values in one column and the probability,  $P(x)$ , in a second column.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Calculators** to open a second drop down. Select the **Custom** calculator at the bottom of the list of calculators.
- Under “Values in”, select the name of the column with the x values. Under “Weights in”, select the name of the column with the  $P(x)$  values.
- Click **Compute!** The calculator will appear in a new StatCrunch window with the mean and standard deviation.

### **Using Calculators to Find Discrete and Continuous Distributions**

#### **Discrete Distributions**

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#### **Binomial Distributions**

- Click on **Stat** to open the drop-down menu.
- Click or hover over **Calculators** to open a second drop down. Select the **Binomial** calculator.
- Enter the value for n (the number of trials) and p (the probability of success in any one trial)
- Change the sign to match the wording in the problem.
  - Greater than: >
  - Less than: <
  - Equal to: =
  - Greater than or equal to:  $\geq$
  - Less than or equal to:  $\leq$
- Click **Compute!** The result of the calculation will appear in the same window.

#### **Continuous Distributions**

[Click here to watch a video tutorial from StatCrunch.](#)

#### **Normal Distributions**

- Click on **Stat** to open the drop-down menu.
- Click or hover over **Calculators** to open a second drop down. Select the **Normal** calculator.
- Enter values for mean, standard deviation, and probability.
- Change the sign to match the wording in the problem.

- Greater than or equal to:  $\geq$
- Less than or equal to:  $\leq$
- Click **Compute!** The result of the calculation will appear in the same window.

### T Probability Distributions

- Click on **Stat** to open the drop-down menu.
- Click or hover over **Calculators** to open a second drop down. Select the **T** calculator.
- Enter the value for DF (degrees of freedom) and the reference value or probability.
- Change the sign to match the wording in the problem.
  - Greater than or equal to:  $\geq$
  - Less than or equal to:  $\leq$
- Click **Compute!** The result of the calculation will appear in the same window.

### Chi-Square Distributions

- Click on **Stat** to open the drop-down menu.
- Click or hover over **Calculators** to open a second drop-down menu. Select the **Chi-Square** calculator.
- Enter the values for DF (degrees of freedom) and the reference value or probability.
- Change the sign to match the wording in the problem.
  - Greater than or equal to:  $\geq$
  - Less than or equal to:  $\leq$
- Click **Compute!** The result of the calculation will appear in the same window.

## Hypothesis Testing and Confidence Intervals with Data

[Click here to watch a video tutorial from StatCrunch.](#)

### Hypothesis Testing

- Open the data set in StatCrunch, or type the data in a column in a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu. Click or hover over the appropriate statistics function. Select **One** or **Two Sample**.
- Select **With Data**. Select the column(s) of data that will be used for the confidence interval.
  - Z Stats: enter standard deviation if given.
  - Proportion Stats: enter success value if given.
- Under “Perform,” select **Hypothesis Test**. Enter value for  $H_0$  and enter sign and value  $H_A$ .
- Click **Compute!** The calculator will appear in a new window with the result.

### Confidence Intervals

- Open the data set in StatCrunch, or type the data in a column in a blank StatCrunch sheet.

- Click on **Stat** to open the drop-down menu. Click or hover over the appropriate statistics function. Select **One** or **Two Sample**.
- Select **With Data**. Select the column(s) of data that will be used for the confidence interval.
  - Z Stats: enter standard deviation if given.
  - Proportion Stats: enter success value if given.
- Under “Perform,” select **Confidence Interval**. Enter given value for confidence interval as a decimal.
- Click **Compute!** The calculator will appear in a new window with the result. It is important to note that the standard error value given is not the same as the value for the margin of error, which requires a separate calculation.

### Hypothesis Testing and Confidence Intervals with Summary

[Click here to watch a video tutorial from StatCrunch.](#)

#### Hypothesis Testing

- Open a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu. Click or hover over the appropriate statistics function. Select **One** or **Two Sample**.
- Select **With Summary**.
  - Z Stats and T Stats: enter values for mean, standard deviation, and sample size.
  - Proportion Stats: enter number of successes and observations.
  - Variance Stats: enter sample variance and sample size.
  - Simple Linear Regression: enter X and Y variables.
- Under “Perform,” select **Hypothesis Test**. Enter value for  $H_0$  and enter sign for  $H_A$ .
- Click **Compute!** The calculator will appear in a new window with the result.

#### Confidence Intervals

- Open a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu. Click or hover over the appropriate statistics function. Select **One** or **Two Sample**.
- Select **With Summary**.
  - Z Stats and T Stats: enter values for mean, standard deviation, and sample size.
  - Proportion Stats: enter number of successes and observations.
  - Variance Stats: enter sample variance and sample size.
  - Simple Linear Regression: enter X and Y variables.
- Under “Perform,” select **Confidence Interval**. Enter given value for confidence interval as a decimal.

- Click **Compute!** The calculator will appear in a new window with the result. It is important to note that the standard error value given is not the same as the value for the margin of error, which requires a separate calculation.

### Linear Regression

[Click here to watch a video tutorial from StatCrunch.](#)

- Open the data set in StatCrunch, or type the x-values in one column and the y-variables in a separate column in a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Regression** to open a second drop-down menu. Select **Simple Linear**.
- Enter X and Y variables under “X-variable” and “Y-variable”.
- Enter Prediction of Y if given.
- Click **Compute!** A new window will open with the computed data. The second page will supply a graph with a fitted line.

### Goodness-of-fit

#### Normality Test

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- Open the residuals in StatCrunch, or type the residuals in a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Goodness-of-fit**. Select **Normality**.
- Select the column(s) containing the residuals to be tested for normality.
- Select the test to be performed (**Shapiro-Wilk** or **Anderson-Darling**).
- Click **Compute!** A new window will open with the computed data.

#### Chi Square Test

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- Open the data set in StatCrunch, or type the observed values in one column and expected values in another column in a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.
- Click or hover over **Goodness-of-fit**. Select **Chi-Square Test**.
- Select column for observed data under “Observed.”
- Under “Expected,” select column or all cells in equal proportion.
- Click **Compute!** A new window will open with the computed data.

### Bootstrapping

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- Open the data set in StatCrunch, or type the data to be resampled in a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu.

- Click on or hover over **Resample**. Click on or hover over **Applets**. Then select **Bootstrap a Sample**.
- Select column to be resampled under “Samples in.”
- Select statistic to be calculated under “Statistic.”
- Under “Seeding for random data,” select fixed seed.
- Click **Compute!** The bootstrapping data will appear in a new window.
- At the top of the new window, tabs displaying “1 time,” “5 times,” and “1000 times” will appear. Click the corresponding tab until the desired number of resamples has been taken. The box labeled “n” will display the number of resamples taken with each click. The bootstrap distribution will change automatically.

### Contingency Tables

[Click here to watch a video tutorial from StatCrunch.](#)

- Open data set in StatCrunch, or type the contingency table data into a blank StatCrunch sheet. The row labels should be in the first column (var1) of the data sheet.
- Click on **Stat** to open the drop-down menu.
- Click on or hover over **Tables** to open a second drop-down menu. Select **Contingency**. Then select **With Summary**.
- In the “Select column(s)” section, select the column(s) containing the data for the table.
- Under “Row label,” select row labels.
- Under “Column label,” select the desired label.
- Select options for display.
- Under “Perform,” select options for hypothesis test or confidence interval.
- Click **Compute!** A new window will open with the computed data. The second page will supply a heatmap of selected data if the heatmap box is checked.

### One Way ANOVA

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- Open the data set in StatCrunch, or type the data into a blank StatCrunch sheet.
- Click on **Stat** to open the drop-down menu. Select **ANOVA**. Then select **One Way**.
- Select the columns to be compared, or select the “Values in a single column” box to select individual responses and factors.
- Click **Compute!** A new window will open with the column statistics on top and the ANOVA table on the bottom.