

StatCrunch Directions

TABLE OF CONTENTS

Nuts & Bolts (Includes Getting Started)	3
Purchase StatCrunch	3
Sign in on StatCrunch	4
Open StatCrunch	4
Enroll in the <i>Stats at Cuyamaca College</i> Group	5
Sort a StatCrunch Spreadsheet	8
Access Info In StatCrunch & Transfer Info Out of StatCrunch	9
Open Your Unique IAT Sample in StatCrunch	9
Open a Data Set in the <i>Stats at Cuyamaca College</i> Group	10
Download StatCrunch Output Window	12
Embed Pictures in a Textbox	13
Copy & Paste a StatCrunch Output Table	17
Copy & Paste StatCrunch Text Output	18
Graphs & Two-way Tables	19
Create a Histogram	19
Adjust Histogram Bin Width	20
Create a Scatterplot	21
Create a Pie Chart	21
Create a Two-way Contingency Table with Data	22
Produce Scatterplot, LSR Line, Regression Equation, & R	23
Produce the Correlation Coefficient, R, in StatCrunch	24
Side-by-side Boxplots for the ANOVA Project	25
Side-by-Side Boxplots	26
Side-by-Side Boxplots Stacked Data	27
Side-by-Side Boxplots Unstacked Data	27
Side-by-Side Dotplots Stacked Data	28
Side-by-Side Dotplots Unstacked Data	28
Side-by-Side Histograms Stacked Data	29
Side-by-Side Histograms Untacked Data	29

Summary Statistics	30
Make a Table of the 5-Number Summary.....	30
Make a Table of 5-Number Summaries Across Multiple Groups	32
Descriptive Statistics	33
Sample Sizes and Means for Two Groups in an IAT Data Set	34
Descriptive Statistics Across Multiple Categories	35
Descriptive Statistics Multiple Categories Stacked Data Format.....	36
Descriptive Statistics Multiple Categories Unstacked Data Format	36
Inference (Confidence Intervals and Hypothesis Tests).....	37
One Proportion Confidence Interval from Data	37
Conduct a Hypothesis Test for a Difference in Two Population Means	40
One Column Sample Data – Hypothesis Test for a Difference in Two Population Means.....	41
Two Column Sample Data – Hypothesis Test for a Difference in Two Population Means	42
Summarized Data – Hypothesis Test for the a Difference in Two Population Means	42
Conduct a T-test Using StatCrunch	43
Conduct a Matched Pairs T-test.....	43
Hypothesis Test for a Population Proportion	44
Summarized Data One-sample Hypothesis Test.....	44
One Sample T-Interval with Data	45
ANOVA F-test Stacked Data Format.....	46
ANOVA F-test Unstacked Data Format	46
Chi-square Test for Independence (Summarized Data).....	47
Chi-square Test for Independence with Row Data	49

NUTS & BOLTS (INCLUDES GETTING STARTED)

PURCHASE STATCRUNCH

You may purchase an access code to StatCrunch through the College Bookstore. Or you can purchase StatCrunch directly at www.statcrunch.com and follow these steps.

STEP 1:

Click on **Sign in or Register** in the upper right corner



STEP 2:

Scroll down and click **Register**.

Sign in

Username

Password

Show

[Forgot your username or password?](#)

Sign in

By signing in, you agree to our [Terms of Use](#).

Need to register?

Register

STEP 3:

Select the **Students** tab and then click **Purchase**.

Register or renew **1**



To renew, purchase access code, then redeem it.

Purchase or redeem access code

Redeem access code

☒ 6 months for \$14.99

☐ 12 months for \$24.99

2

Purchase

STEP 4:

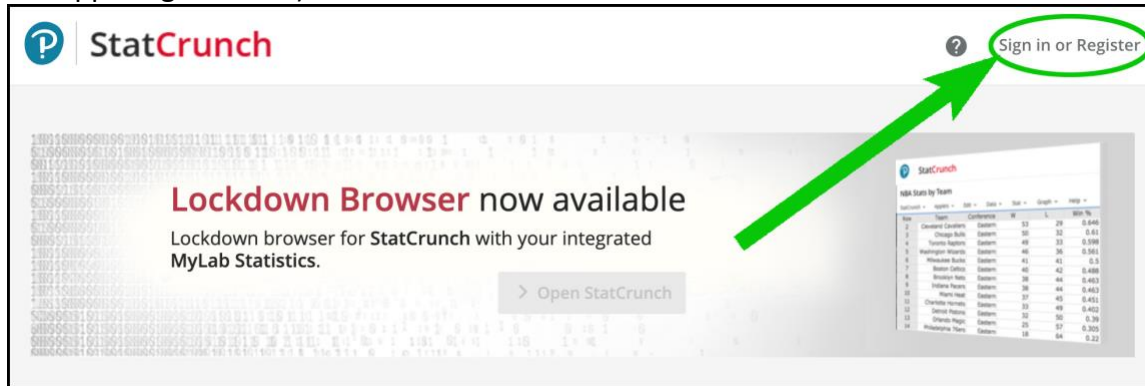
Follow the StatCrunch prompts to complete your purchase.

After you set up your StatCrunch account, you will be able to access the software from any computer with Internet access.

SIGN IN ON STATCRUNCH

STEP 1:

Go to www.statcrunch.com (Links to an external site.). Then select **Sign in or Register** (typically in the upper right corner).



STEP 2:

Enter your username and password on the StatCrunch Sign-in page and then select **Sign-in**.

OPEN STATCRUNCH

Go to www.statcrunch.com and login. Select **Open StatCrunch**.



ENROLL IN THE *STATS AT CUYAMACA COLLEGE* GROUP

To access the data sets in this class, you will need to join the *Stats at Cuyamaca College* group on StatCrunch. The directions below assume that your StatCrunch account is set up.

Note: You will only need to do this once.

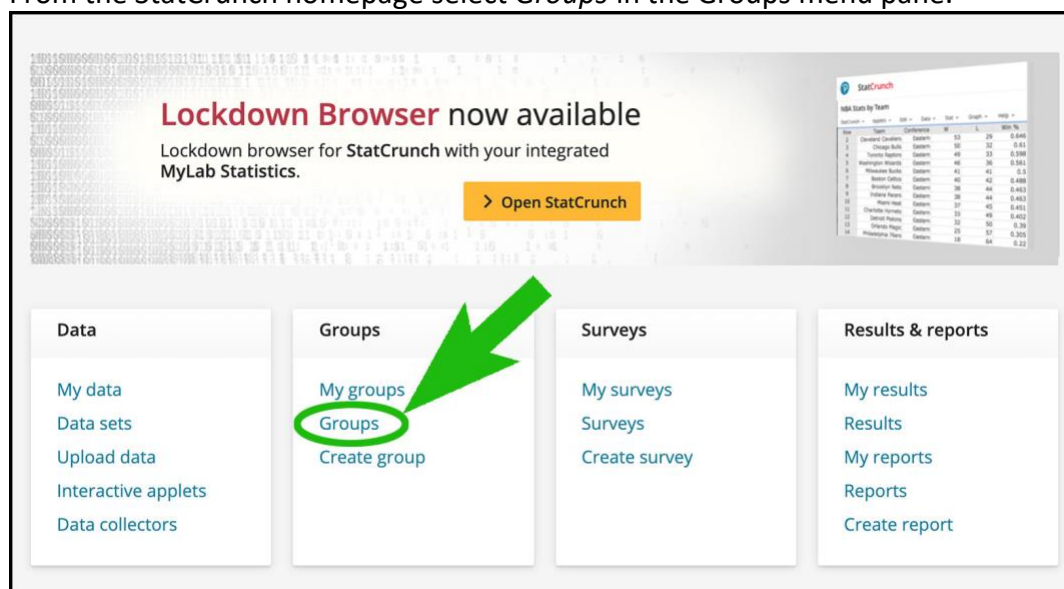
STEP 1:

If you are already signed into StatCrunch, click on the **StatCrunch** logo (typically in the upper left corner) to return to the StatCrunch homepage.

If you are not signed into StatCrunch, sign in.

STEP 2:

From the StatCrunch homepage select *Groups* in the Groups menu pane.



Continued on the next page ...

STEP 3:

Type *Stats at Cuyamaca College* in the search box and press **Enter**.

< Home

Groups

Groups My groups

Search by keywords, tags or owner.

Groups ⇅ Owner ⇅ Edited ↓ Members

STA 2023 Summer 2021 A group for Dr. Tommy Minton's STA 2023 students in Summer 2021. This is a private group in which approval has to be granted by Dr. Minton.	mintonr	May 06, 2021	1
Final Stats Report	dmorena17	May 06, 2021	2
final	lcho4	May 05, 2021	1

STEP 4:

Click on the *Stats at Cuyamaca College* link.

< Home

Groups

Groups My groups

Search by keywords, tags or owner.

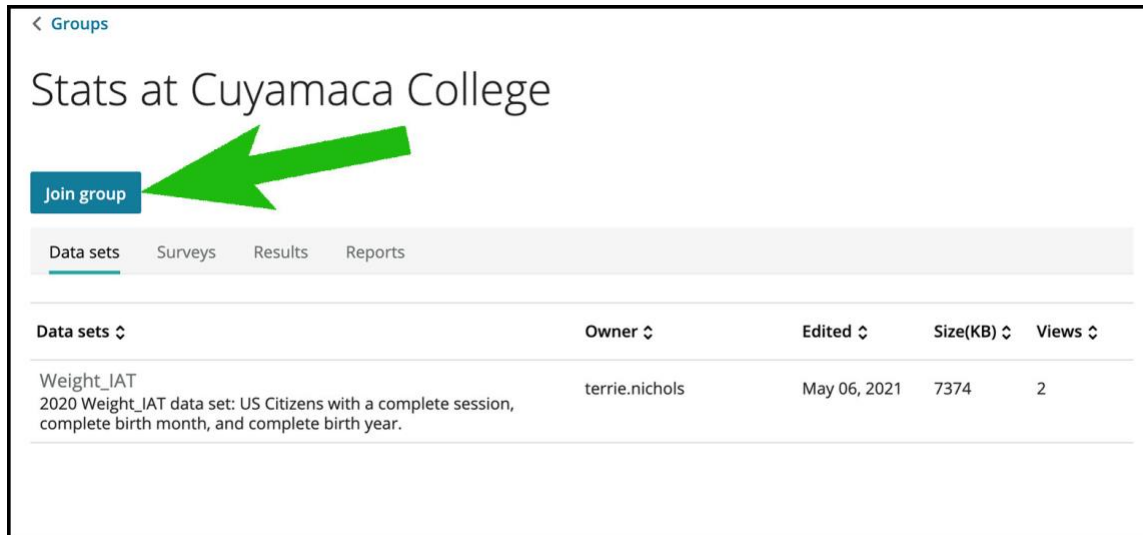
1 groups matching Stats at Cuyamaca College.

Stats at Cuyamaca College	terrie.nichols	May 06, 2021	1
---	----------------	--------------	---

Continued on the next page ...

STEP 5:

Click the **Join Group** button.



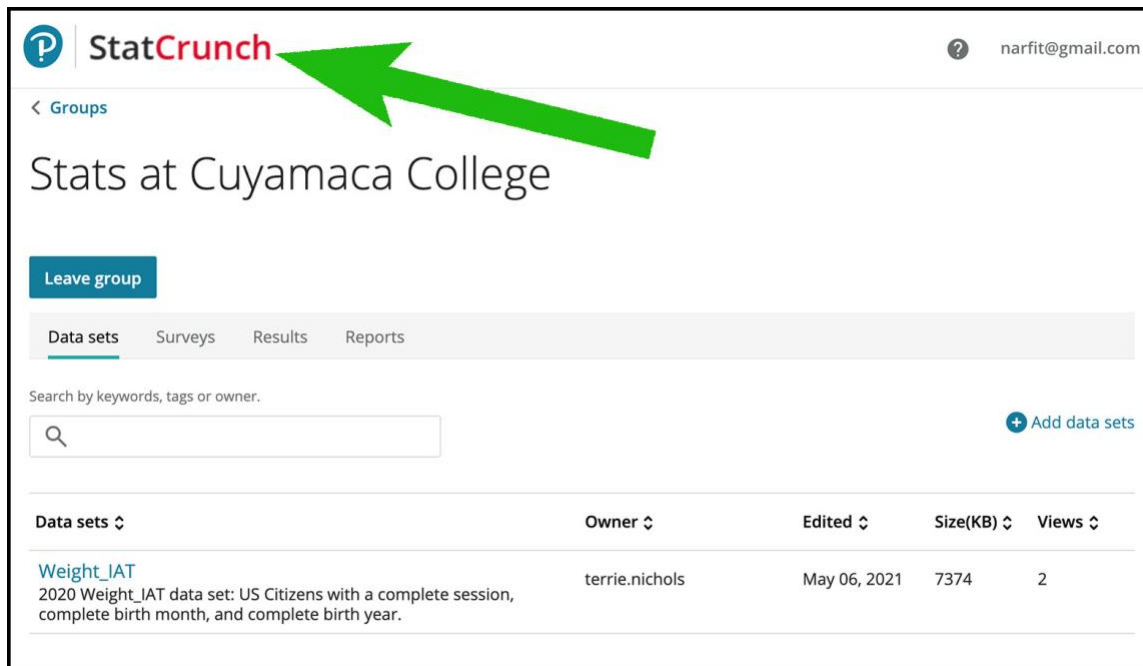
The screenshot shows the 'Stats at Cuyamaca College' group page. At the top left, there is a '< Groups' link. Below the group name, there is a blue button labeled 'Join group', which is highlighted by a large green arrow. Below the button is a tabbed interface with 'Data sets', 'Surveys', 'Results', and 'Reports'. The 'Data sets' tab is active. Below the tabs is a table with columns: 'Data sets', 'Owner', 'Edited', 'Size(KB)', and 'Views'. The table contains one entry: 'Weight_IAT' with a description '2020 Weight_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.', owner 'terrie.nichols', edited 'May 06, 2021', size '7374', and views '2'.

Data sets	Owner	Edited	Size(KB)	Views
Weight_IAT 2020 Weight_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 06, 2021	7374	2

You should now see a message indicating that you have successfully joined the *Stats at Cuyamaca College* group.

STEP 6:

Return to the StatCrunch home page by clicking on the **StatCrunch** logo.



The screenshot shows the 'Stats at Cuyamaca College' group page. At the top left, there is a '< Groups' link. Below the group name, there is a blue button labeled 'Leave group'. Below the button is a tabbed interface with 'Data sets', 'Surveys', 'Results', and 'Reports'. The 'Data sets' tab is active. Below the tabs is a search bar with the placeholder text 'Search by keywords, tags or owner.' and a magnifying glass icon. To the right of the search bar is a blue button labeled '+ Add data sets'. Below the search bar is a table with columns: 'Data sets', 'Owner', 'Edited', 'Size(KB)', and 'Views'. The table contains one entry: 'Weight_IAT' with a description '2020 Weight_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.', owner 'terrie.nichols', edited 'May 06, 2021', size '7374', and views '2'. A large green arrow points from the 'StatCrunch' logo in the top left corner of the page to the 'StatCrunch' logo in the top right corner of the page.

Data sets	Owner	Edited	Size(KB)	Views
Weight_IAT 2020 Weight_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 06, 2021	7374	2

SORT A STATCRUNCH SPREADSHEET

First Method

- 1) Move your mouse to the upper right corner of the column you want to sort by, and a down arrow will appear.
- 2) Click on the down arrow and a drop-down menu will appear. Choose "Sort table ascending" or "Sort table descending."



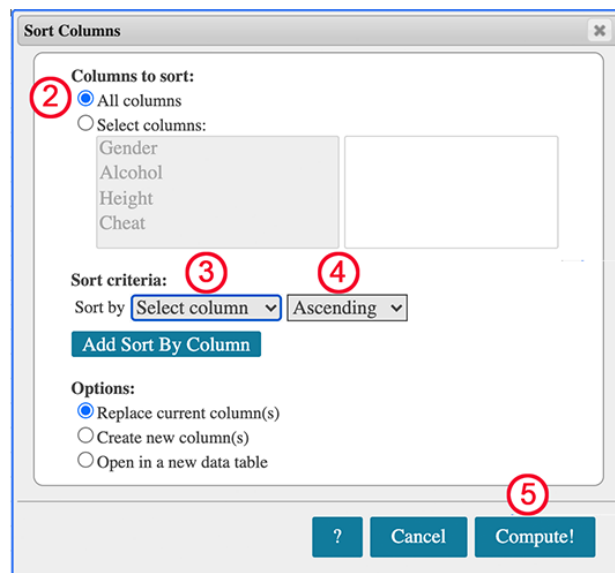
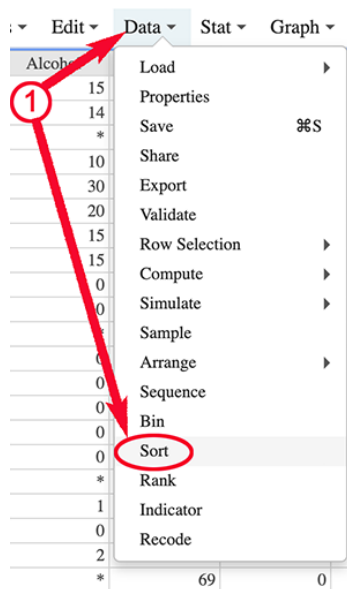
drinking.xlsx

StatCrunch ▾ Applets ▾ Edit ▾ Data ▾ Stat

Row	Gender	Alcohol	Height
1	Female		64
2	Male		69
3	Female		66
4	Female		63
5	Male		72
6	Female		67
7	Male		69
8	Male		74
9	Male		72
10	Female		63
11	Male	*	68.5

Second Method

1. Go to **Data** → **Sort**
2. Select the **All columns** radio button (default setting)
3. Under **Sort criteria**: Click on the **Select column** drop-down menu and select a column to sort on.
4. Also under **Sort criteria**: Click on the **Ascending** drop-down menu and select **Ascending** or **Descending**.
5. Click **Compute!**

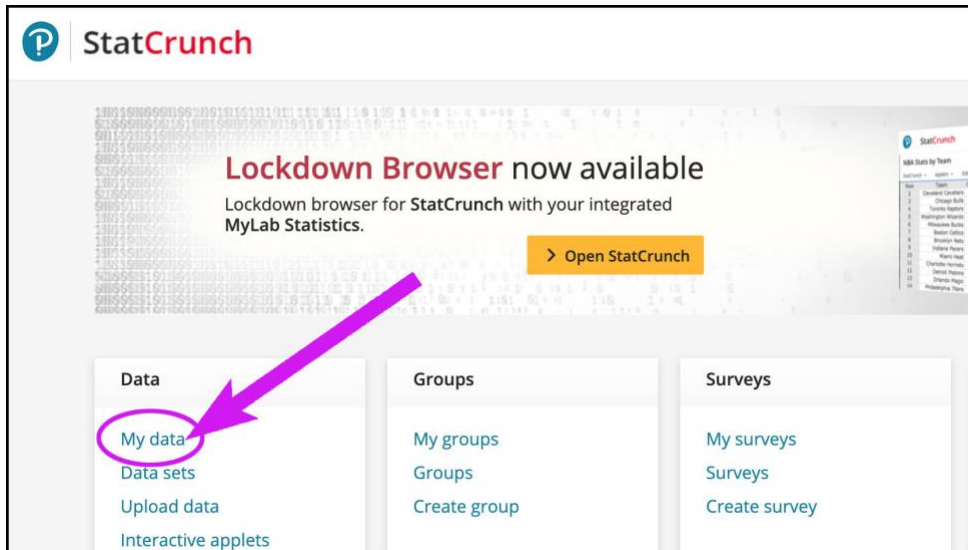


ACCESS INFO IN STATCRUNCH & TRANSFER INFO OUT OF STATCRUNCH

OPEN YOUR UNIQUE IAT SAMPLE IN STATCRUNCH

Use the bulleted instructions below to open your unique data set in StatCrunch.

- If you are not signed in on StatCrunch, open StatCrunch and sign-in ([directions](#) - opens in new tab).
- Under the **Data** section on the homepage, click on **My Data**.

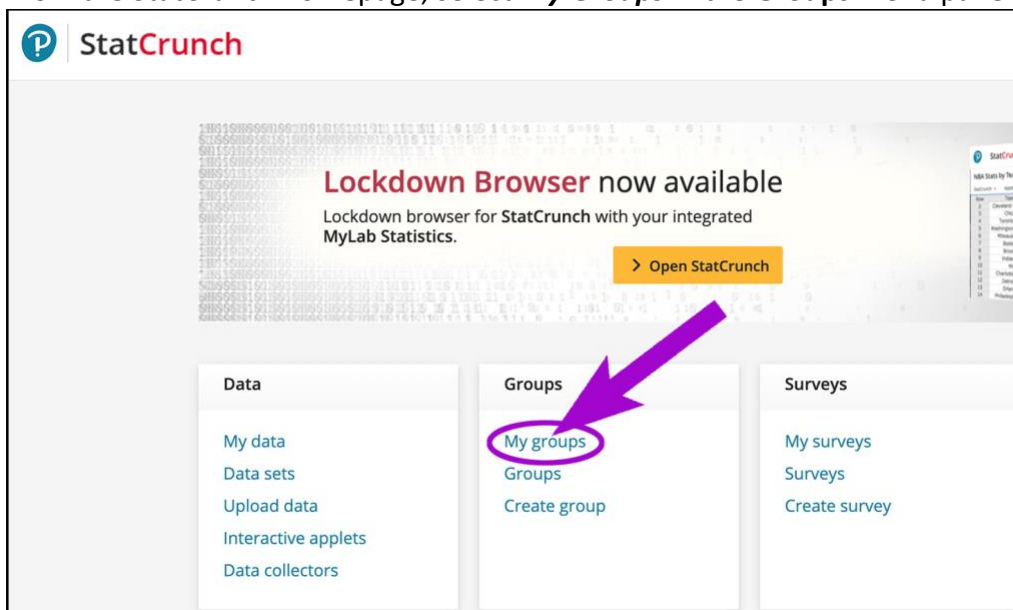


- A new tab, **My Data sets**, is now open. You should see your IAT sample data set (although you may need to scroll or search to find it).
- Click on your IAT sample data set to open it in StatCrunch.

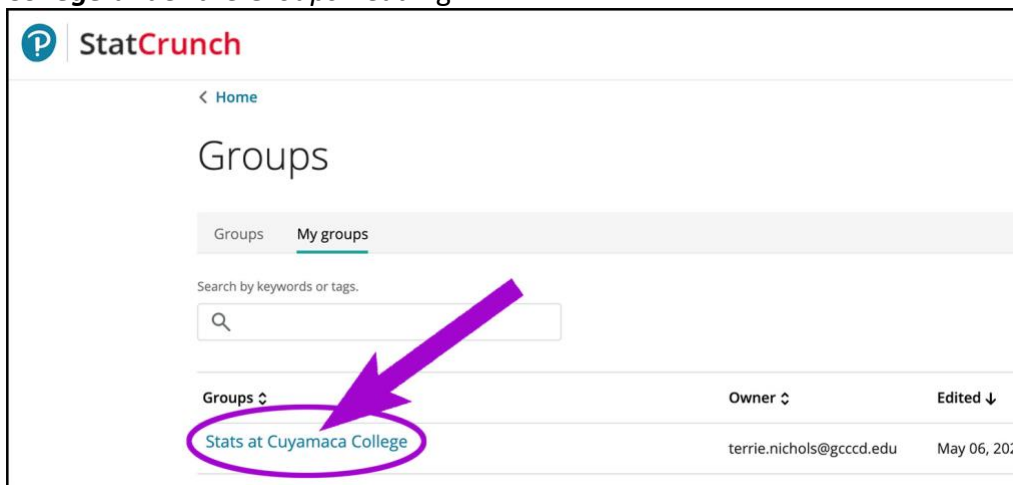
OPEN A DATA SET IN THE *STATS AT CUYAMACA COLLEGE* GROUP

These instructions assume that you have joined the **Stats at Cuyamaca College** group in StatCrunch.

- If you are already signed into StatCrunch, return to the StatCrunch homepage by clicking on the **StatCrunch** logo (typically in the upper left corner in StatCrunch).
- If you are not signed into StatCrunch, sign in.
- From the StatCrunch homepage, select **My Groups** in the **Groups** menu pane.

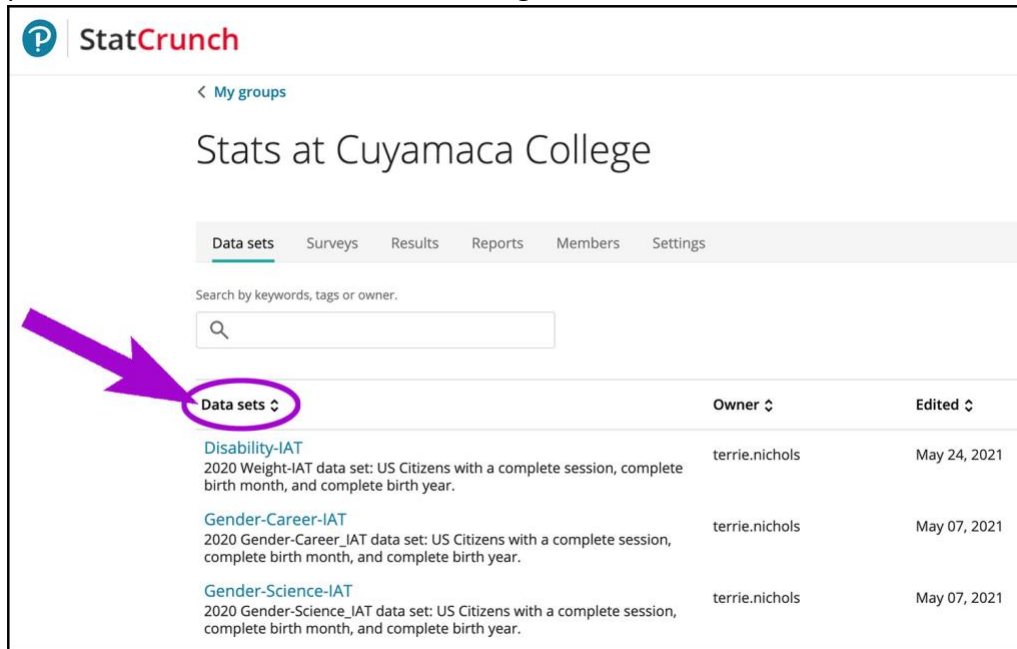


- The *My Groups* tab of the *Groups* page should be open. Click on **Stats at Cuyamaca College** under the *Groups* heading.



Continued on the next page ...

- The **Stats at Cuyamaca College** group page is now open. Under the **Data sets** heading, locate and select the data set you need to open. **WARNING: To find your data set, you may need scroll down. Also, you may need to click the arrow to move to the next page in the Data sets list (see the second screenshot below). Not sure which data set you need?** Click on the browser tab for the assignment you are working on. The name of the data set is provided in the **Data** section of the assignment in Canvas.



StatCrunch

< My groups

Stats at Cuyamaca College

Data sets Surveys Results Reports Members Settings

Search by keywords, tags or owner.

Q

	Owner ↕	Edited ↕
Disability-IAT 2020 Weight-IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 24, 2021
Gender-Career-IAT 2020 Gender-Career_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 07, 2021
Gender-Science-IAT 2020 Gender-Science_IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 07, 2021

Weapons-IAT 2020 Sexuality-IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 08, 2021	4113	6
Weight-IAT 2020 Weight-IAT data set: US Citizens with a complete session, complete birth month, and complete birth year.	terrie.nichols	May 06, 2021	7374	23
actor	terrie.nichols	Jun 08, 2021	<1	1
graduation	terrie.nichols	Oct 20, 2020	<1	3
drinking	terrie.nichols	Oct 17, 2020	5	2

Page 1 of 2

< >

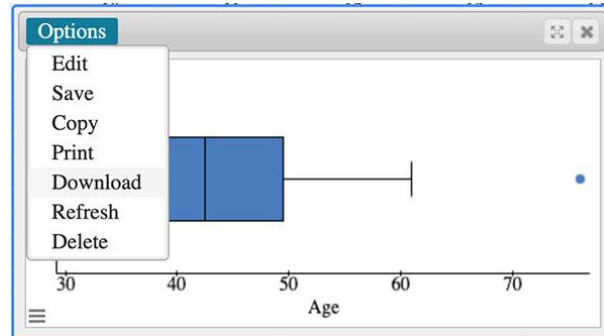
DOWNLOAD STATCRUNCH OUTPUT WINDOW

No screenshots; please use these directions.

To download and save any StatCrunch output window as a picture:

- 1) Select **Options** in the upper left corner of the StatCrunch output window.

From the drop-down menu, select **Download**.



- 2) Enter a name for the file in the dialogue box and click **Okay**.

Your computer should display a familiar download window. Proceed according to your system's requirements for downloading a file. Be sure to note where you saved it.

File name

Enter a name for the .png file below:

graph.png

Cancel **Okay**

You now have a .png file you can embed in a textbox (quiz, assignment, or discussion textbox).

EMBED PICTURES IN A TEXTBOX

These directions apply to embedding a picture (.png or .jpeg file) into a discussion, quiz, or assignment text box.

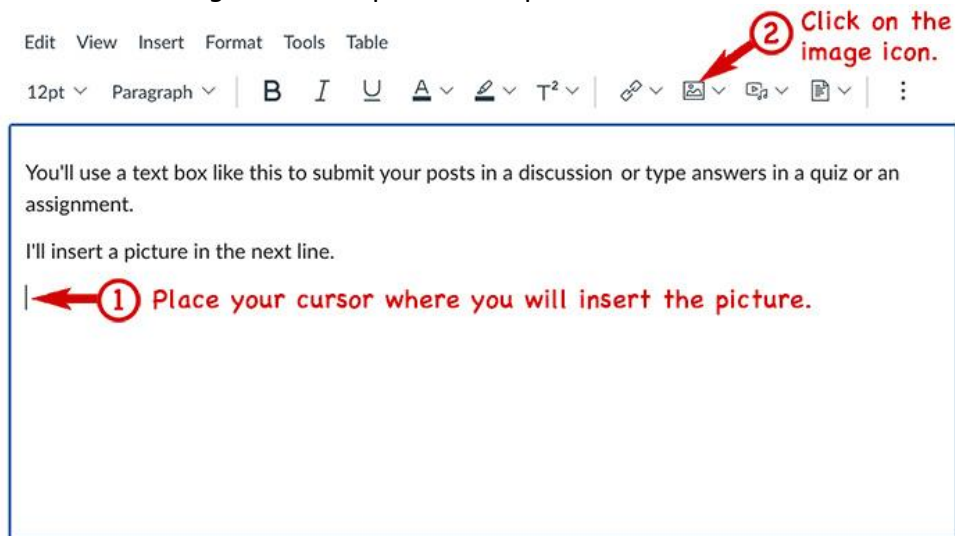
With the picture saved on your device as a .jpeg or .png file:

STEP 1

Place the cursor in the textbox on the line where you will embed the picture.

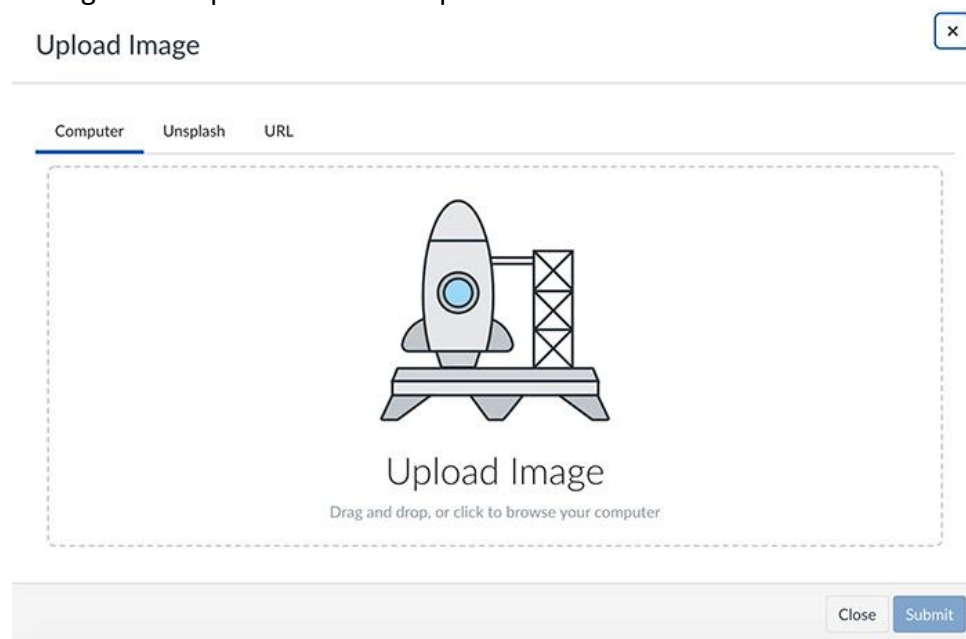
STEP 2

Click on the *image icon* to open the dropdown menu.



STEP 3

A drag-and-drop box should be open.



Continued on the next page ...

STEP 4

Drag the picture from your device and drop it in the box.


Upload Image

Computer

Unsplash

URL

Screen Shot 2021-01-26 at 4.06.35 PM.png




Close

Submit

STEP 5

This is required for all embedded pictures. To make the picture accessible for your sight-impaired classmates, scroll down to the **Alt Text** textbox. Enter a brief description of the picture in the textbox. For example, I would enter "Goat at Cuyamaca College" as the description in this example.

Upload Image



Attributes

Alt Text ?

(Describe the image)

☐ Decorative Image

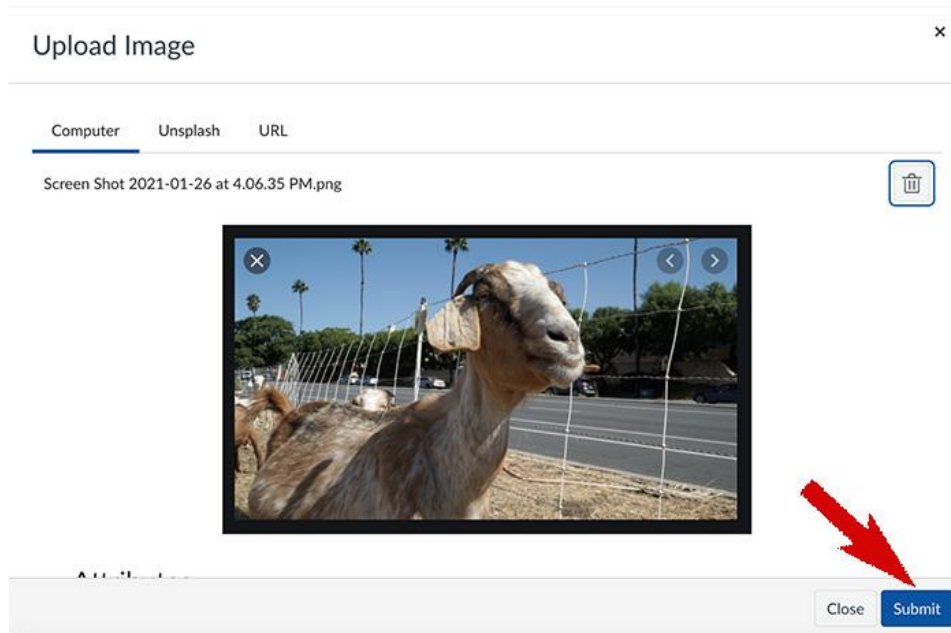
Display Options

☒ Embed Image

Continued on the next page ...

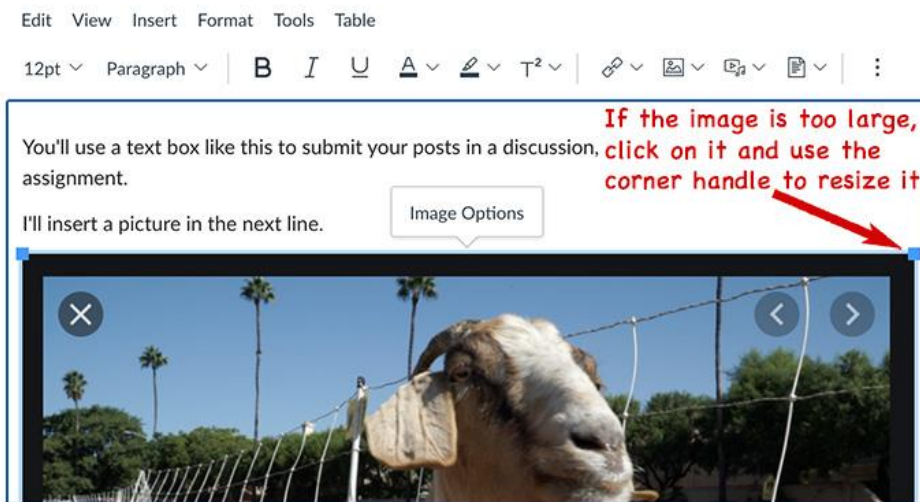
STEP 6

Click **Submit**.



STEP 7

The picture should appear in the Text Box. If the image is too large, click on the picture, and then drag a corner handle to resize the image.



Continued on the next page ...

STEP 8

Type **Enter** or **Return** to drop down to the next line and continue typing.

Edit View Insert Format Tools Table

12pt Paragraph B I U A   T²     :



Continue typing on
the next line.

This is one of 300 goats who "went to College" to clear brush at Cuyamaca!

COPY & PASTE A STATCRUNCH OUTPUT TABLE

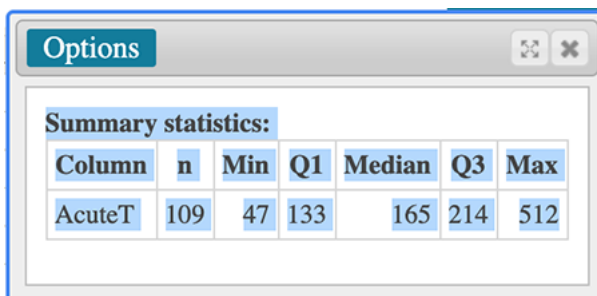
These directions assume you have created a table of statistics in a StatCrunch output window.

To copy the StatCrunch table:

- Click on the StatCrunch output window (the window with the table you want to copy).
- Select all:**

On a Mac press the **command** key and the letter **a** at the same time.

On a PC press the **CTRL** key and the letter **a** at the same time.



Column	n	Min	Q1	Median	Q3	Max
AcuteT	109	47	133	165	214	512

Note: This is an example. Since you are likely using a different datafile, the statistics displayed in this table may be different from the statistics in your table.

Copy the highlighted table.

On a Mac press the **command** key and the letter **c** at the same time.

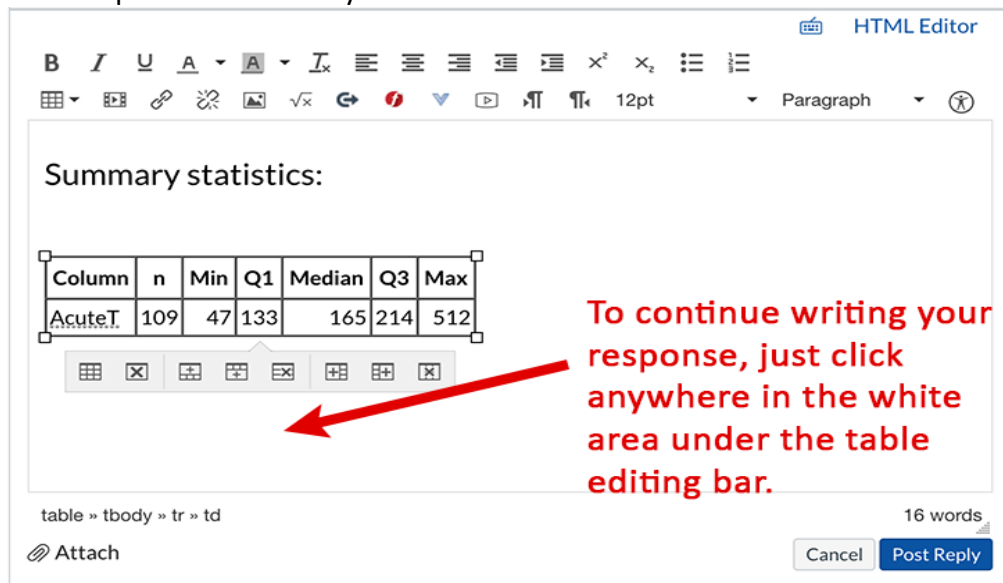
On a PC press the **CTRL** key and the letter **c** at the same time.

To paste the StatCrunch table into a Canvas dialogue box:

- Start your reply in a discussion board or an essay quiz question.
- Place your cursor on a new line.
- Use one of the following key combinations to paste the table into the text area.

On a Mac press the **command** key and the letter **v** at the same time.

On a PC press the **CTRL** key and the letter **v** at the same time.



Summary statistics:

Column	n	Min	Q1	Median	Q3	Max
AcuteT	109	47	133	165	214	512

table » tbody » tr » td

16 words

Attach Cancel Post Reply

- To continue writing your response, click anywhere in the white area under the table editing bar. When you click off of the table, the table-editing bar will disappear.

COPY & PASTE STATCRUNCH TEXT OUTPUT

These directions assume that you have produced a StatCrunch output window containing text.

- Click on the StatCrunch output window.
- Highlight the text you want to copy .
- Copy the highlighted text.

On a Mac press the **command** key and the letter **c** at the same time.

On a PC press the **CTRL** key and the letter **c** at the same time.

- Paste the copied text.

Place your cursor in the textbox (discussion or essay quiz question) where you want to paste the copied text.

On a Mac press the **command** key and the letter **v** at the same time.

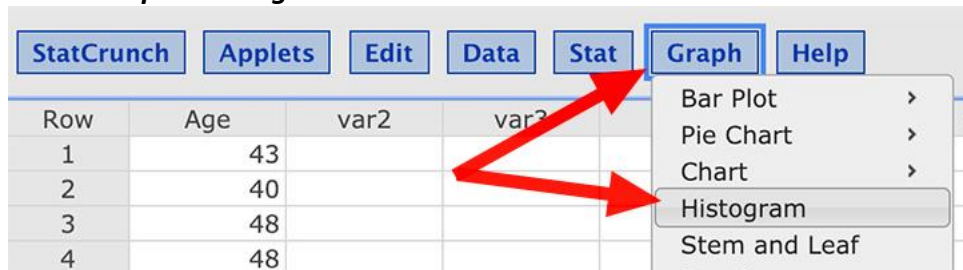
On a PC press the **CTRL** key and the letter **v** at the same time.

GRAPHS & TWO-WAY TABLES

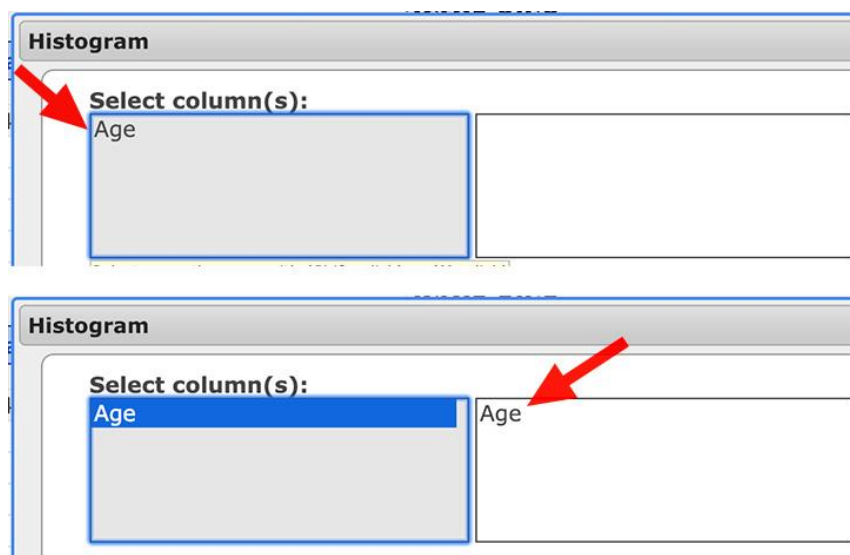
CREATE A HISTOGRAM

To create a histogram in StatCrunch:

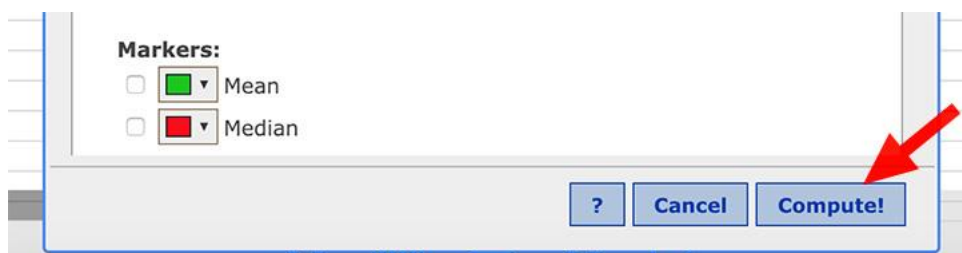
- 1) Load the data file in StatCrunch.
- 2) Select **Graph**→**Histogram**



- 3) StatCrunch uses variables in the **Select column(s)** box on the right to create graphs. Click on a variable to move it from the box on the left to the box on the right.



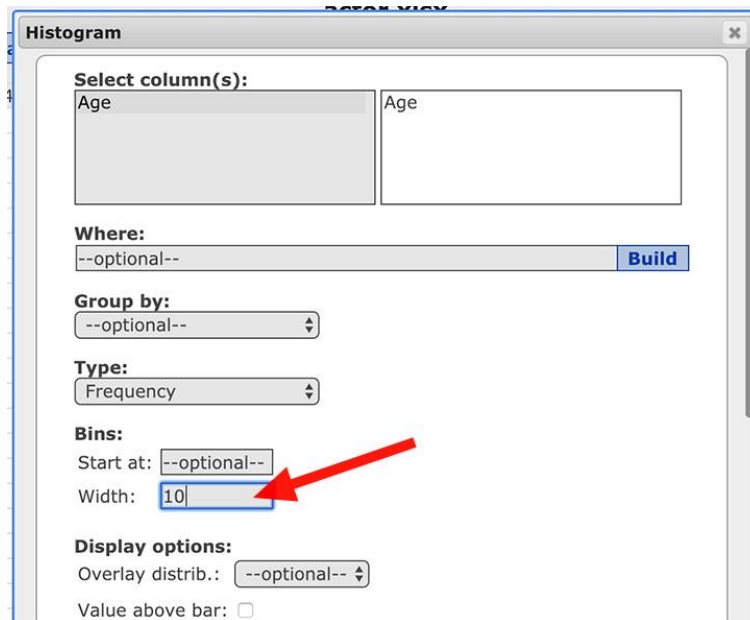
- 4) Click on the **Compute!** button in the bottom right corner of the Histogram dialogue box.



ADJUST HISTOGRAM BIN WIDTH

To change the bin width of a histogram:

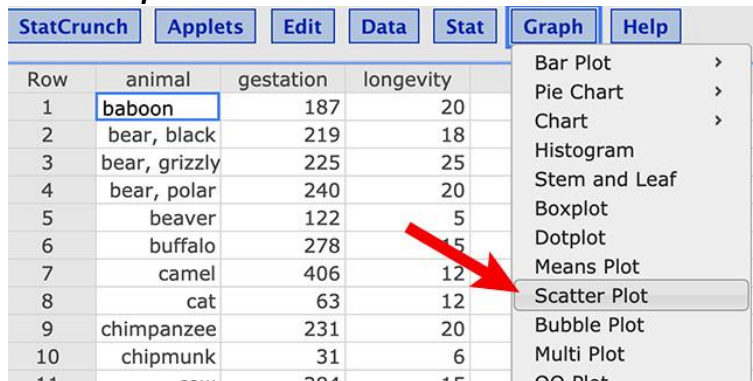
- 1) Select **Graph→Histogram**
- 2) If necessary, move the appropriate variable to the **Select column(s)** box on the left.
- 3) Enter a new width in the **Bins: Width:** textbox.
- 4) Then click **Compute** in the bottom right corner of the Histogram dialogue box.



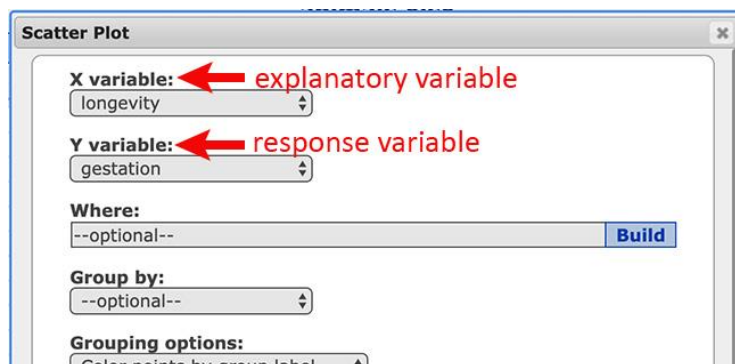
CREATE A SCATTERPLOT

With the datafile uploaded and the spreadsheet of data open in StatCrunch:

- Select **Graph** → **Scatter Plot**



- **X variable:** use the drop-down menu to select the explanatory variable.
- **Y variable:** use the drop-down menu to select the response variable.



- Scroll to the bottom of the *Scatter Plot* window and press **Compute!**

CREATE A PIE CHART

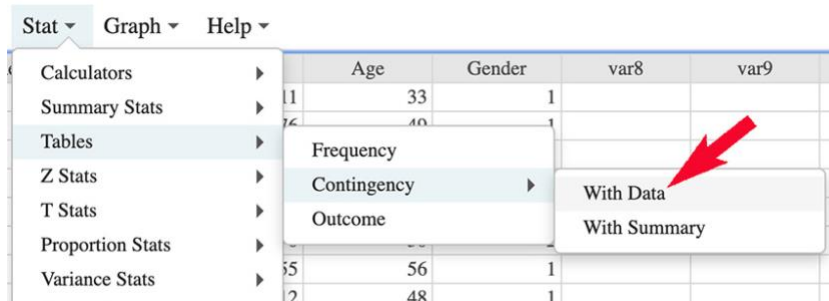
With the datafile uploaded and the spreadsheet of data open in StatCrunch:

- Choose **Graph** → **Pie Chart** → **With Data**
- Under the **Select Column(s):** heading click on the appropriate categorical variable to move it from the white box on the right to the gray box on the right. Note: to find the categorical variable, you may need to use the scroll bar for the white box.
- Leave all other default settings alone. Do not enter anything else.
- Press **Compute!**
- The pie chart with the categorical percentages will appear in a pop-up window.

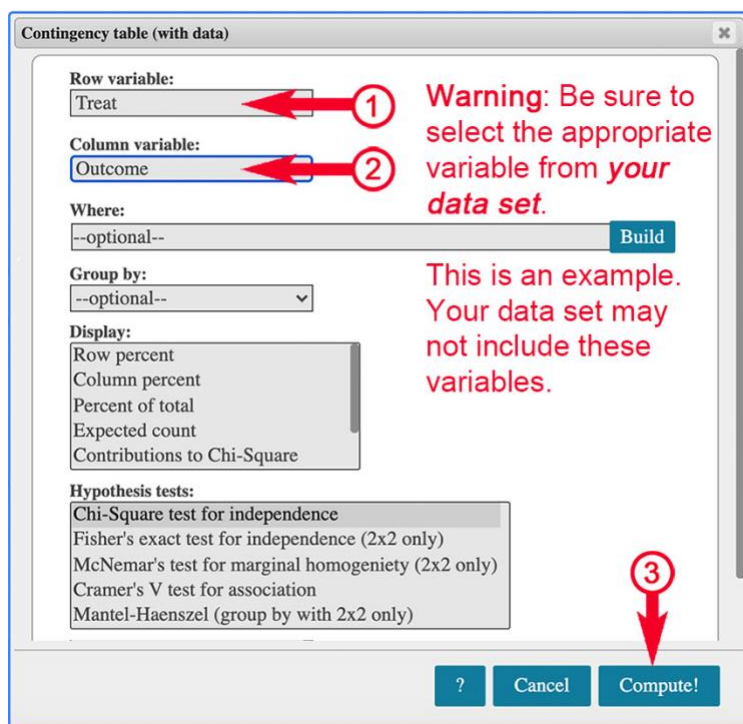
CREATE A TWO-WAY CONTINGENCY TABLE WITH DATA

The directions assume the datafile is open in a StatCrunch worksheet:
To create two-way contingency table:

- Select **Stat** → **Tables** → **Contingency** → **With Data**



- The **Contingency Table (with data)** window is now open.
 - Under the **Row variable:** heading use the drop-down menu to select either the explanatory variable or the response variable (not both).
 - Under the **Column variable:** heading use the drop-down menu to select the other variable (i.e. the explanatory variable if you chose the response variable for the rows OR the response variable if chose the explanatory variable for the rows).
 - Press **Compute!**

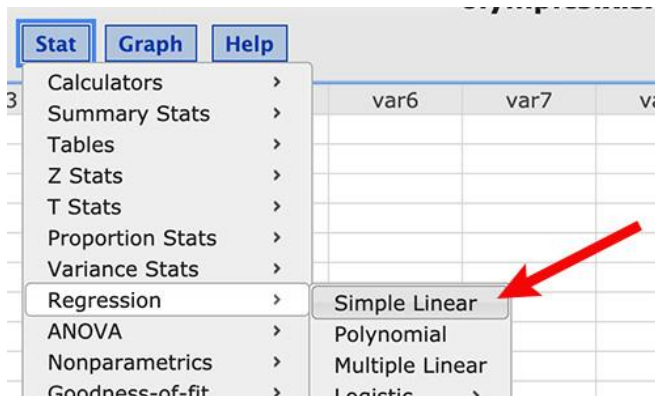


- Two tables are displayed. The first table (**Contingency table results:**) is a two-way contingency table. The second table (**Chi-Square results:**) is from a significance test that we encounter later in the course (ignore it for now).

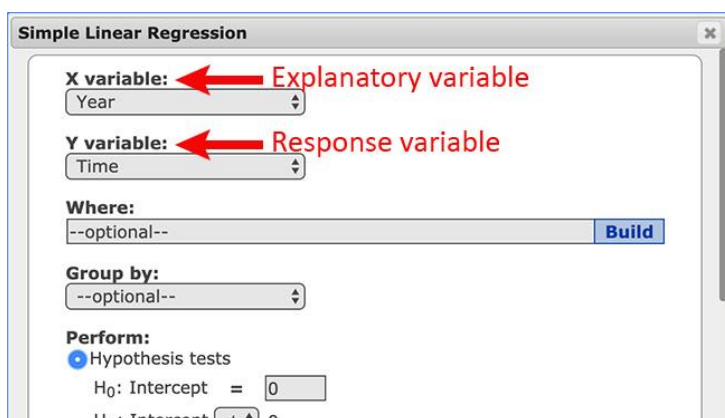
PRODUCE SCATTERPLOT, LSR LINE, REGRESSION EQUATION, & R

These directions assume you have uploaded the datafile to StatCrunch. With the data open in the StatCrunch spreadsheet:

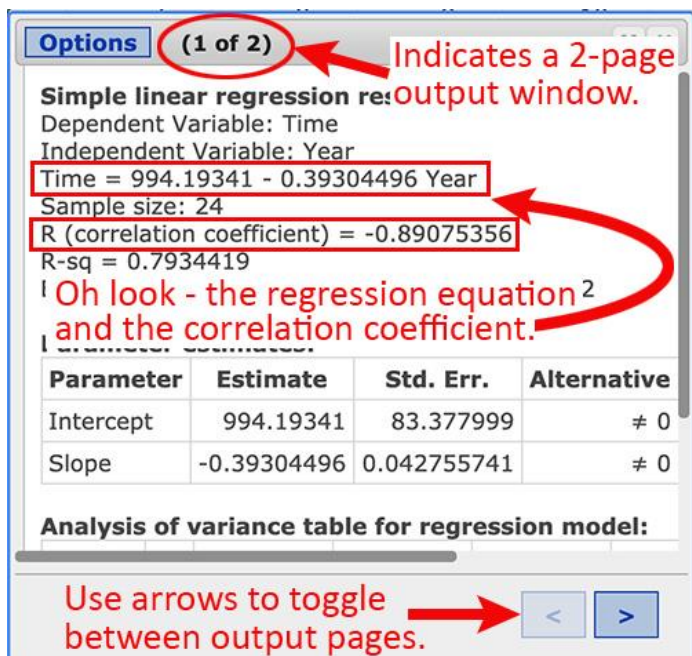
- Select **Stat**→**Regression**→**Simple Linear**



- **X Variable:** use the drop-down menu to select the explanatory variable.
- **Y Variable:** use the drop-down menu to select the response variable.
- Scroll to the bottom of the **Simple Linear Regression** window and press **Compute!**



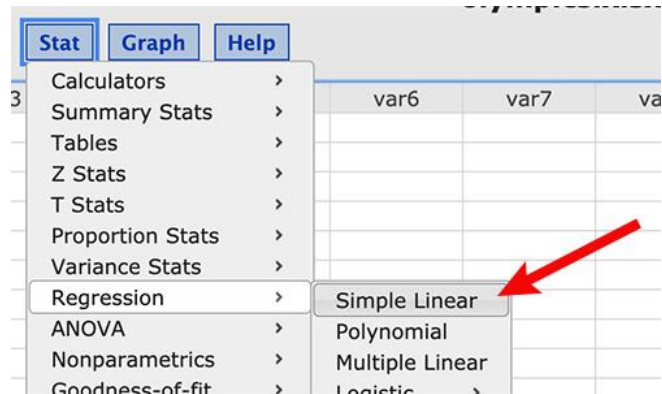
- You now have a two-page output window. Use the arrow keys to toggle between the *graph* and the *statistics* pages.
- The multipage output window includes the following: one page with the regression equation, correlation coefficient, and other statistics; a second page displaying the scatterplot with its regression line.



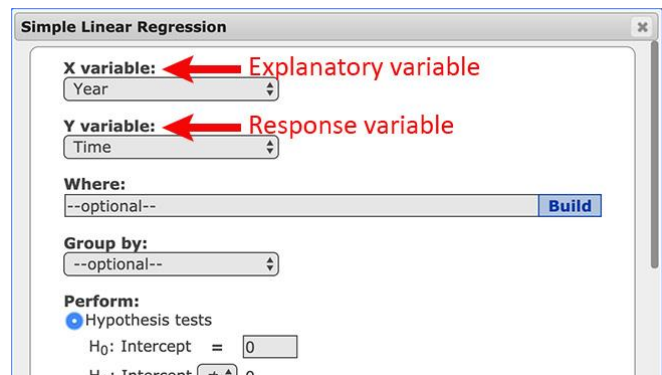
PRODUCE THE CORRELATION COEFFICIENT, R , IN STATCRUNCH

These directions assume you have uploaded the datafile to StatCrunch. With the data open in a StatCrunch worksheet:

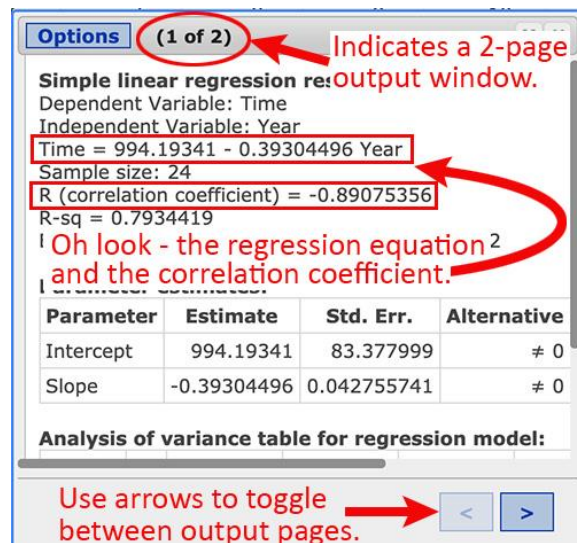
- Select **Stat**→**Regression**→**Simple Linear**



- **X Variable:** use the drop-down menu to select the explanatory variable.
- **Y Variable:** use the drop-down menu to select the response variable.
- Scroll to the bottom of the *Simple Linear Regression* window and press **Compute!**



- You now have a two-page output window. Use the arrow keys to toggle between the *graph* and the *statistics* pages.
- The multipage output window includes the following: one page with the regression equation, correlation coefficient, and other statistics; a second page displaying the scatterplot with its regression line.



SIDE-BY-SIDE BOXPLOTS FOR THE ANOVA PROJECT

These directions assume your unique random sample is open in StatCrunch.

1. Select **Graph** → **Boxplot**.
2. The **Boxplot** window is now open.
 - a. In the **Select column(s):** section, select the **IAT Score** variable to move it to the white box on the right.
 - b. In the **Group by:** section, select the categorical variable you chose from the options listed in the assignment.
 - c. In the **Other options:** section, the **Use fences to identify outliers** option should be checked.
 - d. Also in the **Other options:** section, if you prefer your boxplots to be drawn horizontally, check the **Draw boxes horizontally** option.
 - e. In the Markers: section, check the **Mean** option.
3. Click **Compute!**

The screenshot shows the 'Boxplot' window in StatCrunch. The 'Select column(s):' section has a list of variables on the left and a white box on the right. 'Sample(IAT-Score)' is selected and moved to the right box. The 'Where:' section has '--optional--' and a 'Build' button. The 'Group by:' section has a dropdown menu with 'Sample(Political-ID)' selected. The 'Grouping options:' section has a dropdown menu with 'Plot groups for each column' selected. The 'Other options:' section has two checked options: 'Use fences to identify outliers' and 'Draw boxes horizontally'. The 'Markers:' section has two options: 'Mean' (checked) and 'Median' (unchecked). The 'Add Custom' button is at the bottom left. The bottom right has three buttons: '?', 'Cancel', and 'Compute!'. Annotations include pink circles around 'Sample(IAT-Score)', 'Sample(Political-ID)', 'Other options:', and 'Markers:'. A pink arrow points from the text 'Group by the categorical variable you selected from the options listed in the assignment.' to the 'Group by:' dropdown. Another pink arrow points from the 'Compute!' button to the bottom right.

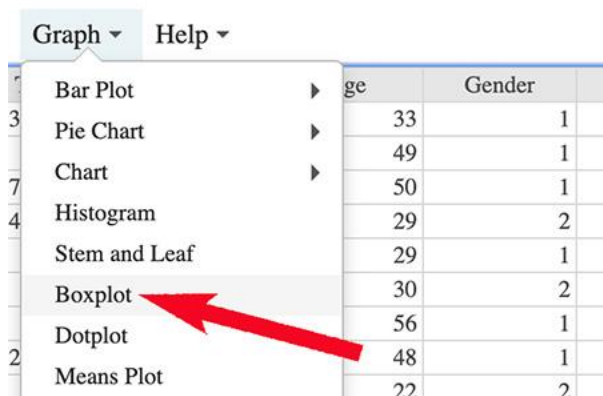
SIDE-BY-SIDE BOXPLOTS

These directions are typically used very early in the course. If this example seems too simple, please see the other *Side-by-Side Boxplots* instructions that follow.

Please note - the variable used in these directions may not match the variable you are using to create side-by-side boxplots. The variable you use to make your side-by-side boxplots will probably NOT be the AcuteT variable (as depicted in the example below).

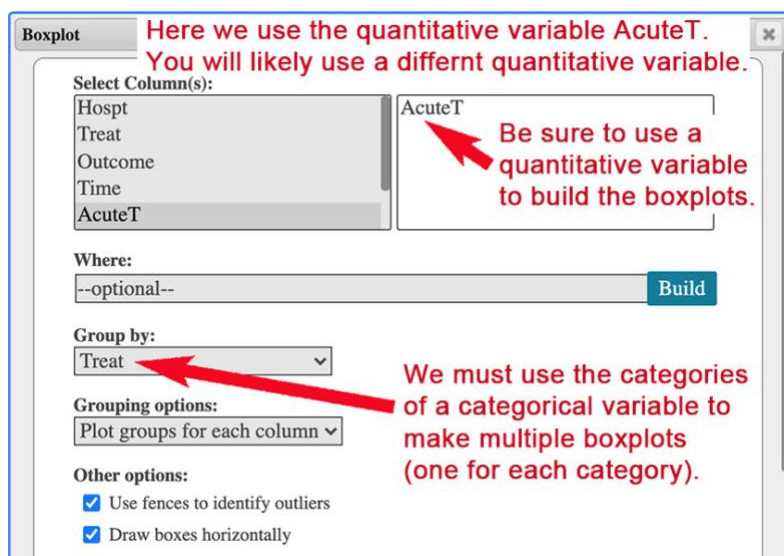
Side-by-side boxplots are used to compare the categories of a **categorical variable** for a single **quantitative variable**. To create side-by-side boxplots and descriptive statistics in StatCrunch:

- 1) Select **Graph** → **Boxplot**



- 2) The **Boxplot** dialogue box is now open.

- Keep in mind that we use a quantitative variable to build a boxplot. So, in **Select Column(s)**: move the appropriate quantitative variable from the box on the left to the box on the right.
- We use the categories of a categorical variable to create multiple boxplots (one for each category). Click on the **Group by**: drop-down menu and select the appropriate categorical variable.



SIDE-BY-SIDE BOXPLOTS STACKED DATA

Data Format: The quantitative data is "stacked" in one column and the groups of the categorical variable are listed in the other column.

With the datafile open in a StatCrunch worksheet:

- Select **Graph** → **Boxplot**.
- Under **Select Columns:** click on the appropriate quantitative variable (this is the response variable) to move it from the gray box on the left to the white box on the right.
- Use the **Group by:** drop-down menu to choose the appropriate categorical variable (this is the explanatory variable).
- Use the **Grouping options:** drop-down menu to select **Plot groups for each column**.
- In the **Other Options:** area, check **Use fences to identify outliers**. This will allow you to see the 1.5IQR Rule outliers as well.
- In the **Markers:** area, check **Mean** to display the means with the boxplots.
- Press **Compute!**

SIDE-BY-SIDE BOXPLOTS UNSTACKED DATA

Data Format: The quantitative data is distributed across multiple columns. Each column represents a group of the categorical variable.

With the datafile open in a StatCrunch worksheet:

- Select **Graph** → **Boxplot**.
- Under **Select Columns:** Choose the columns denoting the comparison groups. These are the categories of the categorical variable. (Note: you may need to hold down the **CTRL** or **command** key to make multiple selections one at a time.).
- Leave the **Group by:** option blank.
- Use the **Grouping options:** drop-down menu to select **Plot groups for each column**.
- In the **Other Options:** area, check **Use fences to identify outliers**. This will allow you to see the 1.5IQR Rule outliers.
- In the **Markers:** area, check **Mean** to display the means with the boxplots.
- Press **Compute!**

SIDE-BY-SIDE DOTPLOTS STACKED DATA

Data Format: The quantitative data is "stacked" in one column and the groups of the categorical variable are listed in the other column.

With the datafile open in a StatCrunch worksheet:

- Select **Graph** → **Dotplot**.
- Under **Select Columns:** click on the appropriate quantitative variable (this is the response variable) to move it from the gray box on the left to the white box on the right.
- Use the **Group by:** drop-down menu to choose the appropriate categorical variable (this is the explanatory variable).
- In the **Grouping options:** area choose **Plot groups for each column**
- In the **Markers:** area, check **Mean** to display the means with the dotplots.
- Scroll down to the **For multiple graphs:** area and change **Columns per page** to 3 (this will graph the dotplots on one page). Also in the **For multiple graphs:** area check **Use same X-axis** (Graphs with the same scale are easier to compare.)
- Press **Compute!**

SIDE-BY-SIDE DOTPLOTS UNSTACKED DATA

Data Format: The quantitative data is distributed across multiple columns. Each column represents a group of the categorical variable.

With the datafile open in a StatCrunch worksheet:

- Select **Graph** → **Dotplot**.
- Under **Select Columns:** choose the columns denoting the comparison groups. These are the categories of the categorical variable. (Note: you may need to hold down the CTRL or COMMAND key to make multiple selections one at a time.).
- Leave the **Group by:** option blank.
- In the **Grouping options:** area choose **Plot groups for each column**
- In the **Markers:** area, check **Mean** to display the means with the dotplots.
- Scroll down to the **For multiple graphs:** area and change **Columns per page** to 3 (this will graph the dotplots on one page). Also in the **For multiple graphs:** area check **Use same X-axis**. (Graphs with the same scale are easier to compare.)
- Press **Compute!**

SIDE-BY-SIDE HISTOGRAMS STACKED DATA

Data Format: The quantitative data is "stacked" in one column and the groups of the categorical variable are listed in the other column.

With the datafile open in a StatCrunch worksheet:

- Select **Graph → Histogram**.
- Under **Select Columns:** click on the appropriate quantitative variable (this is the response variable) to move it from the gray box on the left to the white box on the right.
- Use the **Group by:** drop-down menu to choose the appropriate categorical variable (this is the explanatory variable).
- In the **Markers:** area, check **Mean** to display the means with the histograms.
- Scroll down to the **For multiple graphs:** area and change **Columns per page** to 3 (this will graph the histograms on one page). Also in the **For multiple graphs:** area check **Use same X-axis** and **Use same Y-axis** (Graphs with the same scale are easier to compare.)
- Press **Compute!**

SIDE-BY-SIDE HISTOGRAMS UNTACKED DATA

Data Format: The quantitative data is distributed across multiple columns. Each column represents a group of the categorical variable.

With the datafile open in a StatCrunch worksheet:

- Select **Graph → Histogram**.
- Under **Select Columns:** select the columns denoting the comparison groups. These are the groups of the explanatory variable. (Note: you may need to hold down the CTRL or COMMAND key to make multiple selections.)
- Leave **Group by:** blank.
- In the **Markers:** area, check **Mean** to display the means with the histograms.
- Scroll down to the **For multiple graphs:** area and change **Columns per page** to 3 (this will graph the histograms on one page). Also in the **For multiple graphs:** area check **Use same X-axis** and **Use same Y-axis** (Graphs with the same scale are easier to compare.)
- Press **Compute!**

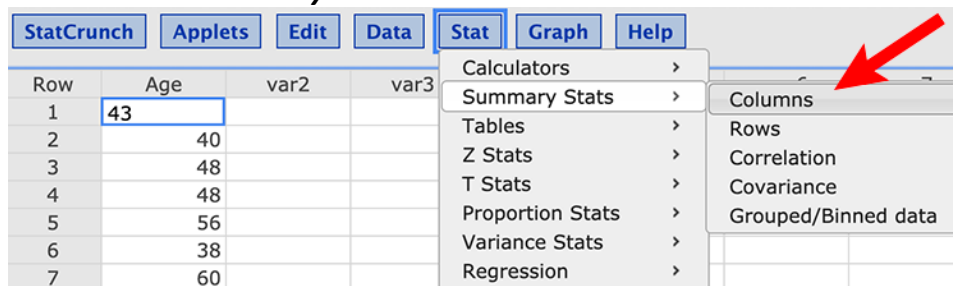
SUMMARY STATISTICS

MAKE A TABLE OF THE 5-NUMBER SUMMARY

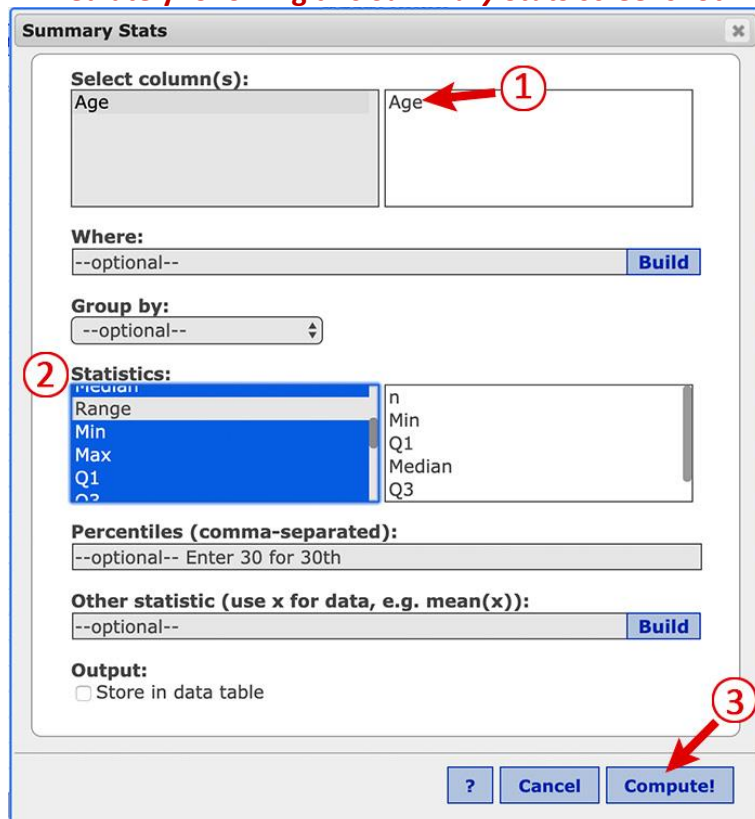
These directions assume that the datafile is open in a StatCrunch worksheet.

To make a table of the five-number summary in StatCrunch:

- Select **Stat** → **Summary Stats** → **Columns**



- The **Summary Stats** window is now open.
- Under **Select column(s)**: click on the appropriate variable to move it to the box on the left. (See 1 in the screenshot below.)
- Under **Statistics**: choose *n* and each item for the 5-number summary. (See 2 in the screenshot below.) **WARNING: Accomplishing this is a little tricky. Please see *Hints* immediately following this *Summary Stats* screenshot.**



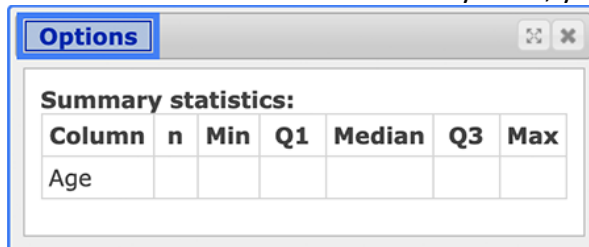
Continued on the next page ...

HINTS: Here are the hints for selecting specific items in the **Statistics:** list (number 2 in the screenshot above). Scroll through the grey box on the left to find all of the items.

Your goal is to have only the items you need in the white box on the right (**in the proper order**). So, we want to choose multiple items but not all items in the **Statistics:** list.

On a Mac, use **command + click** to choose items one at a time. On a PC use **CTRL + click** to choose items one at a time. As you choose each item, it appears in the white box on the right. **The order in which you click on items determines the order the items will appear in the table you create.** If you want your 5-number summary to appear in order (and you should for full credit), you must scroll around in the list (grey box) and choose each item for the 5-number summary in order. (Remember to include n , the sample size.)

- Click **Compute!** (See 3 in the screenshot above)
- Your table will look similar to the one below. However, your second row will include values for n and the five-number-summary. Also, your variable name may be different.



Summary statistics:						
Column	n	Min	Q1	Median	Q3	Max
Age						

- If the statistics are not in the proper order, or if you don't like your table, you can make changes. Click **Options** in the output window containing the table, and then choose **Edit**.

MAKE A TABLE OF 5-NUMBER SUMMARIES ACROSS MULTIPLE GROUPS

These directions assume that the datafile is open in a StatCrunch worksheet.

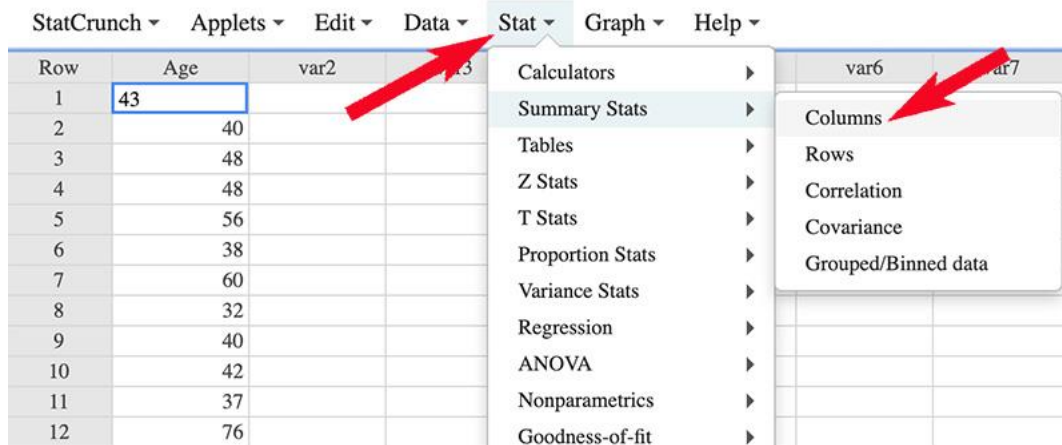
Creating a table of five-number summaries across multiple groups is very similar to creating a table of the five-number summary for one group (see the directions on the previous page). We only need to complete one extra step.

- Select **Stat** → **Summary Stats** → **Columns**
- The **Summary Stats** window is now open.
- Under **Select column(s)**: click on the appropriate variable to move it to the box on the left. (See 1 in the screenshot below.)
- Under **Statistics**: choose n and each item for the 5-number summary.
 - Your goal is to have only the items you need in the white box on the right (**in the proper order**). So, we want to choose multiple items but not all items in the **Statistics**: list.
 - On a Mac, use **command + click** to choose items one at a time. On a PC use **CTRL + click** to choose items one at a time. As you choose each item, it appears in the white box on the right.
 - **The order in which you click on items determines the order the items will appear in the table you create.** If you want your 5-number summary to appear in order (and you should for full credit), you must scroll around in the list (grey box) and choose each item for the 5-number summary in order. (Remember to include n , the sample size.)
- Here's the extra step. Use the **Group by:** dropdown menu to select the **categorical variable** with the groups you will compare.
- Click **Compute!**

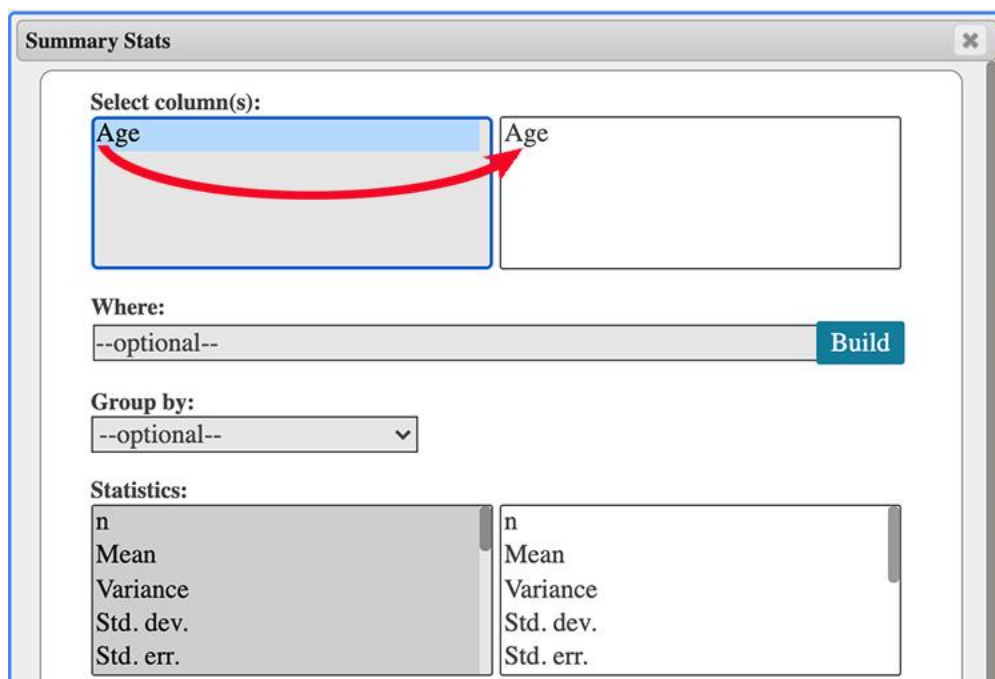
DESCRIPTIVE STATISTICS

To produce descriptive statistics (summary statistics) in StatCrunch:

- 1) Select **Stat** → **Summary Stats** → **Columns**



- 2) In the **Summary Stats** dialogue box, click on the appropriate variable in the left column to move it to the right column.



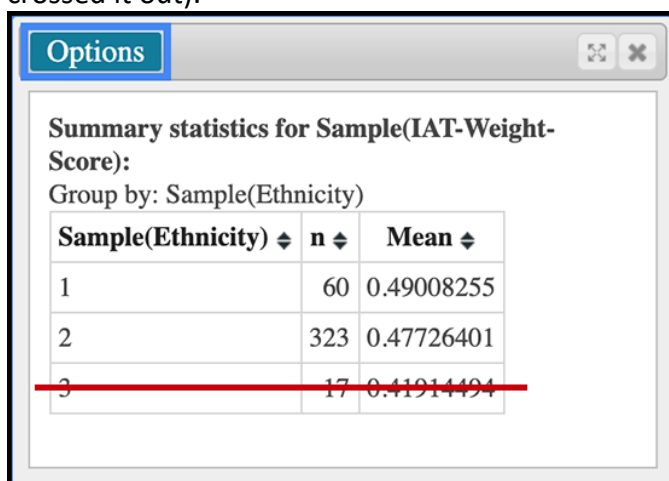
- 3) Scroll to the bottom of the page and click **Compute!**

Note: to recall how to choose statistics so that they appear in the proper order in the StatCrunch output table, see the **Hints** comments on the previous page.

SAMPLE SIZES AND MEANS FOR TWO GROUPS IN AN IAT DATA SET

These directions assume your data set is open in StatCrunch.

1. Select **Stat Summary Stats Columns**
2. The *Summary Stats* window is now open.
 - a. In the **Select column(s):** section, click on the **IAT score** variable to move it to the box on the right.
 - b. In the **Group by:** section, use the drop-down menu to select your chosen categorical variable.
 - c. In the **Statistics:** section, click on **n** (the sample size). On a Mac, use **command + click** to choose the **mean**. Or, on a PC use **CTRL + click** to choose **mean**. As you choose each item, it appears in the white box on the right. In the white box on the right you should now see **n** and **mean**.
 - d. Click **Compute!**
3. Your StatCrunch output window should look similar to this. However, you may be using a different IAT data set. Also you may have chosen a different categorical variable (from the two options provided in the assignment). Finally, your output window may only include two groups as opposed to the three displayed here (although - as per the assignment instructions for this categorical variable, we are directed to ignore the third group, so we crossed it out).



Options

Summary statistics for Sample(IAT-Weight-Score):

Group by: Sample(Ethnicity)

Sample(Ethnicity) ⚡	n ⚡	Mean ⚡
1	60	0.49008255
2	323	0.47726401
3	17	0.41914494

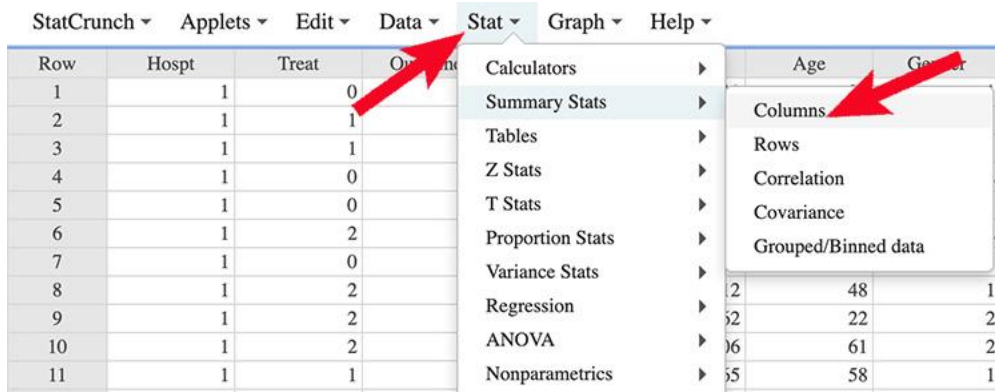
DESCRIPTIVE STATISTICS ACROSS MULTIPLE CATEGORIES

These directions are typically used very early in the course when we have not yet discussed how data is formatted in a spreadsheet. If this example seems inappropriate, please see the other *Descriptive Statistics* instructions.

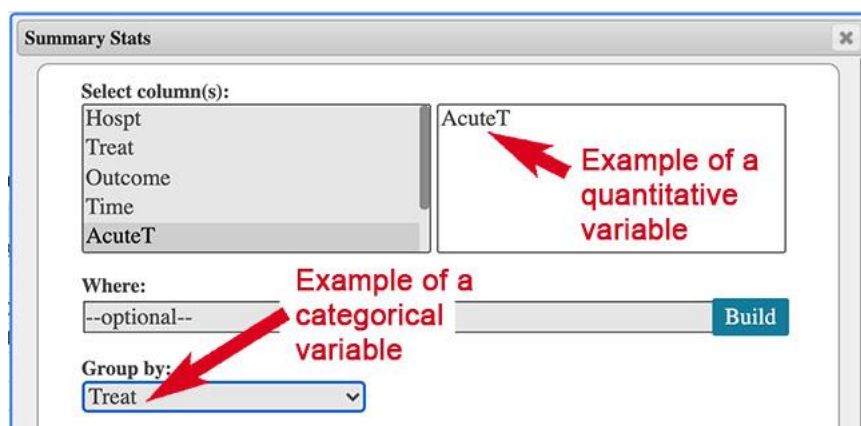
Please note - the variables and data presented in this example may not match the file you are working with.

To compare the descriptive statistics (including frequencies) of a single quantitative variable across multiple categories of a categorical variable:

- 1) Select **Stat** → **Summary Stats** → **Columns**



- 2) Under the **Select column(s):** heading, click on the appropriate quantitative variable in the gray box on the left to move it to the white box on the right. (Note: if all you need are the frequencies for each category of a categorical variable, just select any quantitative variable.) Then open the **Group by:** drop-down menu and select the appropriate categorical variable.



- 3) Scroll to the bottom of the page and click **Compute!** (Note: if you all you need are the frequencies for each category of the categorical variable, the **n** counts are listed in the second column.)

DESCRIPTIVE STATISTICS MULTIPLE CATEGORIES STACKED DATA FORMAT

Data Format: The values of the single quantitative variable are in one column, and another column indicates which category each observation belongs to (**stacked data format**).

With the data spreadsheet open in StatCrunch:

- Select **Stats** → **Summary Stats** → **Columns**
- Under the **Select Column(s):** heading click the response variable (quantitative data) to move it from the gray box on the left to the white box on the right.
- Use the **Group by:** drop-down menu to select the explanatory variable (categorical data).
- Under the **Statistics:** heading, select *n*, *Mean*, and *Std. dev.* (not *Std. err.*). Note: you may need to hold down the **CTRL** or **command** key to make multiple selections one at a time.
- Press **Compute!**

DESCRIPTIVE STATISTICS MULTIPLE CATEGORIES UNSTACKED DATA FORMAT

Data Format: The values of the single quantitative variable appear in multiple columns where each column is dedicated to a category (group) of the categorical variable (**unstacked data format**).

With the datafile open in a StatCrunch worksheet:

- Select **Stats** → **Summary Stats** → **Columns**
- Under the **Select Column(s):** heading, choose each comparison group one at a time to move each group from the gray box on the left to the white box on the right. These are the categories of the explanatory variable, but not the explanatory variable itself. (Note: you may need to hold down the CTRL or COMMAND key to make multiple selections.)
- Leave **Group by:** blank.
- Under the **Statistics:** heading, select *n*, *Mean*, and *Std. dev.* (not *Std. err.*). Note: you may need to hold down the **CTRL** or **command** key to make multiple selections one at a time.
- Press **Compute!**

INFERENCE (CONFIDENCE INTERVALS AND HYPOTHESIS TESTS)

ONE PROPORTION CONFIDENCE INTERVAL FROM DATA

These directions assume your data set is open in StatCrunch.

Keep in mind that your data set may be different from the data set in this example. In this example, we calculate the 90% confidence interval to estimate the proportion of females who participated in the 2020 Disability-IAT. Our sample size is $n = 300$.

STEP 1

Click on the **Stat** drop-down menu and select **Proportion Stats** → **One Sample** → **With Data**.

The screenshot shows the StatCrunch web application interface. At the top, the StatCrunch logo is visible. Below it, the text "Sampled from Disability-IAT" is displayed. A navigation bar contains several dropdown menus: StatCrunch, Applets, Edit, Data, Stat, Graph, and Help. The "Stat" dropdown menu is open, showing a list of statistical analysis options. A pink arrow points to the "Proportion Stats" option. The "Proportion Stats" submenu is also open, showing "One Sample" and "Two Sample" options. The "One Sample" submenu is open, and the "With Data" option is circled in pink. The background shows a data table with columns for various demographic and survey data.

Row	Sample(Birth-C	Sample(Gender	Sample(Ra	Stat	Sample(Politic	Sample(Religi	Sample(IAT	Sample(Prefers	Sampl
1	1	1		Calculators	5	7	2	0.75411767	4
2	1	1		Summary Stats	4	2	3	1.3400095	5
3	2	5		Tables	5	7	1	-0.3506152	1
4	2	2		Z Stats	4	3	4	-0.069735668	4
5	2	2		T Stats	5	4	3	0.38517503	4
6	1			Proportion Stats					
7	2	2		One Sample				With Data	
8	2	2		Two Sample				With Summary	
9	2	2		Variance Stats				Power/Sample Size	
10	2	2		Regression	8	6	1	Width/Sample Size	
11	2	2		ANOVA	3	6	3		
12	2	2		Nonparametrics	4	2	4		
13	2	2		Goodness-of-fit	7	4	3	0.15732529	4
14	1	1		Control Charts	5	3	4	0.43169092	4
15	2	2		Resample	7	4	1	0.73616927	3
16	2	2		Time Series	5	2	4	0.66953988	5
17	2	2			5	6	3	-0.1405432	4
18	2	2			5	4	2	1.1413313	5
19	2	2			6	2		-0.59612025	3
20	2	2			5	4	1	1.353599	4

Continued on the next page ...

STEP 2

The **One Sample Proportion** window is now open.

1. Under the **Values in:** heading, click on the appropriate variable in the gray box on the left so that it appears in the white box on the right.
2. Under the **Success:** heading, enter the label for the variable's category (group). For example if the category label is actually "female," you would type "female" in the textbox. However, in this particular data set, the label for the born-female group is the number 2, so we typed "2" rather than the word "female" in the textbox.
3. Under the **Perform:** heading, check the **Confidence interval for p** radio dial. Then enter the confidence level as a decimal number in the **Level** textbox. Since we want a confidence level of 90%, we entered 0.90 in the **Level** textbox.
4. Click **Compute!**

The screenshot shows the "One Sample Proportion" dialog box with the following settings and annotations:

- Values in:** A list box on the left contains "Sample(Age)", "Sample(Birth-Gender)", "Sample(Gender-ID)", "Sample(Race)", and "Sample(Ethnicity)". "Sample(Birth-Gender)" is selected and highlighted in blue. A pink arrow labeled "1" points to this selection. To the right, a white text box contains "Sample(Birth-Gender)". A pink arrow labeled "2" points to this text box.
- Success:** A text box contains the number "2". A blue arrow labeled "3" points to this text box. To the right of the dialog, blue text reads: "Enter the category 'label,' which could be a word. Here '2' is the label for born-female. If the category label was the word 'female,' we would typed 'female' in the textbox."
- Where:** A text box contains "--optional--".
- Group by:** A text box contains "--optional--".
- Perform:** Two radio buttons are present. The first is "Hypothesis test for p" with $H_0: p = 0.5$ and $H_A: p \neq 0.5$. The second is "Confidence interval for p", which is selected with a blue dot. A pink arrow labeled "4" points to this radio button. Below it, a "Level:" text box contains "0.90". A pink arrow labeled "5" points to this text box. Below that, a "Method:" dropdown menu is set to "Standard-Wald".
- Output:** A checkbox labeled "Store in data table" is unchecked.
- Buttons:** At the bottom right are three buttons: "?", "Cancel", and "Compute!". A pink arrow labeled "6" points to the "Compute!" button.

Continued on the next page ...

STEP 3

Options

One sample proportion confidence interval:

Outcomes in : Sample(Birth-Gender)

Success : 2

p : Proportion of successes

Method: Standard-Wald

This is the category (group) label. Here "2" represents "born-female."

90% confidence interval results:

Variable	Count	Total	Sample Prop.	Std. Err.	L. Limit	U. Limit
Sample(Birth-Gender)	230	300	0.76666667	0.024419179	0.72650069	0.80683264

From this StatCrunch output table we have the following.

- $\hat{p} \approx 0.7667$
- The lower limit of our confidence interval is about 0.7265.
- The upper limit of our confidence interval is about 0.8068.

So our confidence interval is (0.7265, 0.8068).

CONDUCT A HYPOTHESIS TEST FOR A DIFFERENCE IN TWO POPULATION MEANS

There is no need to upload a datafile to StatCrunch. To conduct the hypothesis test for a difference in two population means using StatCrunch, you will first need to review each of the **three types of data formats** below and then identify the data format that matches the format for your data, and use those directions.

- 1) **Sample data in one column**, and another column indicates which category the observation belongs to. The table below is an example of data formatted this way. Note that one column contains the response and one contains the explanatory variable. This is also known as a **stacked data format**.

Score (Y)	Gender (X)
15	Male
13	Female
10	Female
12	Male
14	Female
14	Male

To conduct a hypothesis test for a difference in two population means using this data format, navigate to the section listed below.

[One Column Sample Data – Hypothesis Test for a Difference in Two Population Means](#)

- 2) **Sample data in different columns**— for each of the two samples, data appear in a column dedicated to the category for that sample. The table below is an example of data formatted this way. Note that the column headings are the categories of the explanatory variable, and each response value (sample data) is listed in the column with other values from that same category.

Male	Female
15	13
12	10
14	14

To conduct a hypothesis test for a difference in two population means using this data format, navigate to the section listed below.

[Two Column Sample Data – Hypothesis Test for a Difference in Two Population Means](#)

- 3) **Summarized data**—we are not given the actual data. Instead we are given the data summaries: **sample size**, **sample mean** and **sample standard deviation** for each of the two samples. The table below is an example of summarized data.

	n	\bar{y}	S
20 – 29 yrs old	712	83.4	18.7
75+ yrs old	1001	78.5	19.0

To conduct a hypothesis test for a difference in two population means using this data format, navigate to the section listed below.

[Summarized Data – Hypothesis Test for a Difference in Two Population Means](#)

ONE COLUMN SAMPLE DATA – HYPOTHESIS TEST FOR A DIFFERENCE IN TWO POPULATION MEANS

These directions assume the data worksheet is open in StatCrunch. Detailed written directions follow the video directions.

Data Format: Sample data in one column, and another column indicates which category the observation belongs to (**stacked data format**).

Video Directions: Here is a [video example](#) demonstrating how to use StatCrunch to conduct a two-sample t-test when the quantitative variable (sample data) is in one column and the group designations for the categorical variable are in another column. **Note: in this video example we choose "less than" for the alternative hypothesis, but you should choose the appropriate option for your particular alternative hypothesis.**

Written Directions:

1. Choose: **Stat** → **T Stats** → **Two Sample** → **With Data**
2. Select the data column (twice - the first time for Sample 1 and the second time for Sample 2).
3. Under the **Sample 1:** heading:
 - a. Use the **Values in:** drop-down menu to select the appropriate quantitative variable.
 - b. Use the **Where** option to "build" the Sample 1 group. Here you are "building" a category from the explanatory variable. To do this:
 - Click on **Build**.
 - Then choose the appropriate categorical variable, and click on it until the categorical variable shows up in the **Expression** line at the top of the **Expression** window.
 - Your cursor should now be in the **Expression** line right after the categorical variable. Type the equal sign.
 - Use the **Values:** drop-down menu (bottom-left of the **Expression** window) to select the group for your first sample. Then click the **Add** button (to the right of the drop-down menu).
 - Click **Okay** in the bottom right corner of the **Expression** window.
4. For the second sample, we repeat these steps. Under the **Sample 2:** heading:
 - a. Use the **Values in:** drop-down menu to select the appropriate quantitative variable. The same quantitative variable you selected for Sample 1.
 - b. Use the **Where** option to "build" the Sample 2 group. Here you are "building" a category from the explanatory variable. To do this:
 - Click on **Build**.
 - Then choose the same categorical variable you chose for Sample 1, and click on it until the categorical variable shows up in the **Expression** line at the top of the **Expression** window.
 - Your cursor should now be in the **Expression** line right after the categorical variable. Type the equal sign.
 - Use the **Values:** drop-down menu (bottom-left of the **Expression** window) to select the group for your second sample. Then click the **Add** button (to the right of the drop-down menu).
 - Click **Okay** in the bottom right corner of the **Expression** window.
5. Under **Perform** select the appropriate hypothesis test (based on the alternative hypothesis).
6. Press **Compute!**

TWO COLUMN SAMPLE DATA – HYPOTHESIS TEST FOR A DIFFERENCE IN TWO POPULATION MEANS

These directions assume the data worksheet is open in StatCrunch. Detailed written directions follow the video directions.

Data Format: Sample data in two columns - for each of the two samples, data appear in a column dedicated to the category for that sample (**unstacked data format**).

Video Directions: Here is a [video example](#) demonstrating how to use StatCrunch to conduct a two-sample t-test when the quantitative variable (sample data) is in two columns.

Written Directions:

- Choose: **Stat** → **T Stats** → **Two Sample** → **With Data**
- Under the **Sample 1:** heading use the dropdown menu to select the quantitative variable for one group of the categorical variable.
- Under the **Sample 2:** heading use the dropdown menu to select the same quantitative variable for the other group of the categorical variable.
- Under **Perform** select the appropriate hypothesis test.
- Press **Compute!**

SUMMARIZED DATA – HYPOTHESIS TEST FOR THE A DIFFERENCE IN TWO POPULATION MEANS

Open StatCrunch. There is **no need to upload a datafile** to StatCrunch when using summary statistics.

Data Format: Summarized data - we are not given the actual data. Instead we are given the data summaries: **sample size**, **sample mean** and **sample standard deviation** for each of the two samples (**summarized data format**).

Video Directions: Here is a [video example](#) demonstrating how to use StatCrunch to conduct a two-sample t-test when the quantitative variable (sample data) is in two columns.

Written Directions:

- Choose: **Stat** → **T statistics** → **Two sample** → **With Summary**
- Enter the sample means, sample standard deviations, and sample sizes for both samples.
- Under **Perform** select the appropriate hypothesis test.
- Press **Compute!**

CONDUCT A T-TEST USING STATCRUNCH

With the datafile loaded and the spreadsheet open in StatCrunch:

- Choose: **Stat** → **T Stats** → **One Sample** → **With Data**.
- Under the **Select Column(s):** heading click on the relevant variable to move it from the gray box on the left to the white box on the right.
- Under the **Perform:** heading:
 - Verify that the button for **Hypothesis test for μ** is selected.
 - For the null hypothesis, enter a null value for the population mean.
 - For the alternative hypothesis, choose from the options of **not equal**, **less than**, or **greater than**.
- Press **Compute!**

CONDUCT A MATCHED PAIRS T-TEST

Note: StatCrunch will create the *Differences* column by calculating *Sample 1 - Sample 2*, so be sure to select the appropriate columns for each sample.

With the datafile uploaded and the spreadsheet open in StatCrunch:

- Select **Stat** → **T Stats** → **Paired**.
- Under the **Sample 1 in:** heading, select the column for Sample 1 (remember, StatCrunch will calculate the *Differences* as *Sample 1 - Sample 2*).
- Under the **Sample 2 in:** heading, select the column for Sample 2 (remember, StatCrunch will calculate the *Differences* as *Sample 1 - Sample 2*).
- Under the **Save:** heading, check *Differences*.
- Under the **Perform:** heading:
 - Verify that the radio button for **Hypothesis test** is checked.
 - For the null hypothesis, enter a null value for $H_0: \mu_D$.
 - For the alternative hypothesis, choose from the options of \neq , $<$, or $>$ (when choosing, be sure to consider how the differences were calculated).
- Press **Compute!**

HYPOTHESIS TEST FOR A POPULATION PROPORTION

With the datafile uploaded and the spreadsheet open in StatCrunch:

- Choose **Stat** → **Proportion Stats** → **One Sample** → **With Data**
- Under the **Values in:** heading, click on the categorical variable with the outcomes for the test. Note: you may need to use the scroll bar for the white box to find the appropriate variable.
- In the **State:** text-box specify the outcome that denotes a success. For example, if the outcomes are *yes* and *no*, and *yes* denotes a success, you would type *yes* in the text-box. WARNING: you must type the outcome exactly as it appears in the spreadsheet. For example if *yes* denotes a success and you type *Yes* with a capital Y, StatCrunch will not perform the test.
- Under the **Perform:** heading, check the radio button for **Hypothesis test for p**. Complete the null hypothesis by entering the null value (type over the default of 0.5). To complete the alternative hypothesis, use the drop-down menu to select $<$, $>$, or \neq .
- Click **Compute!**

The screenshot shows the 'One Sample Proportion' dialog box in StatCrunch. Red arrows and text provide instructions for each field:

- Values in:** A list of variables (Year, Exercise, Sleep, Veg, Cell) is shown. A red arrow points to the scrollbar on the right, with the text: "Used this scrollbar to find the variable Cell."
- Success:** The text box contains 'yes'. A red arrow points to it with the text: "Typed exactly as the outcome YES appeared in the spreadsheet."
- Where:** A dropdown menu shows '--optional--'. A blue 'Build' button is to its right.
- Group by:** A dropdown menu shows '--optional--'.
- Perform:**
 - The radio button for 'Hypothesis test for p' is selected.
 - The null hypothesis $H_0: p = 0.80$ is shown. A red arrow points to the '0.80' with the text: "Typed over the default null value 0.05."
 - The alternative hypothesis $H_A: p < 0.80$ is shown. A red arrow points to the '<' symbol with the text: "Used the drop-down menu to replicate the alternative hypothesis."
 - The 'Confidence interval' radio button is unselected.
 - The 'Level' is set to 0.95.
 - The 'Method' is set to 'Standard-Wald'.
- Output:** The checkbox 'Store in data table' is unselected.
- At the bottom right, there are buttons for '?', 'Cancel', and 'Compute!'. A red arrow points to the 'Compute!' button with the text: "Click".

SUMMARIZED DATA ONE-SAMPLE HYPOTHESIS TEST

Open StatCrunch. Since you are using summarized data, there is no need to upload a datafile.

With the empty StatCrunch spreadsheet open:

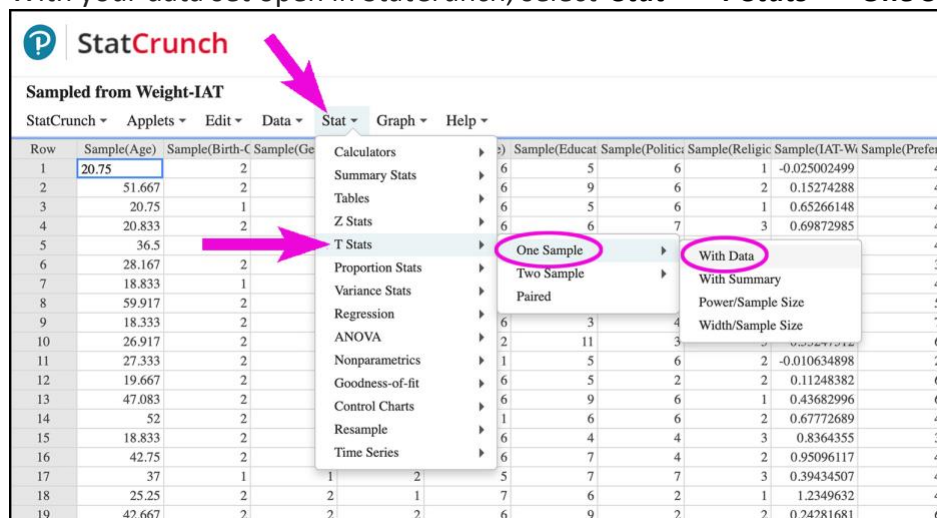
- Choose **Stat** → **T Stats** → **One sample** → **With Summary**
- Enter the summary statistics
- Adjust the null and alternative hypotheses as appropriate

ONE SAMPLE T-INTERVAL WITH DATA

Estimate a population mean using a T-model and StatCrunch.

STEP 1

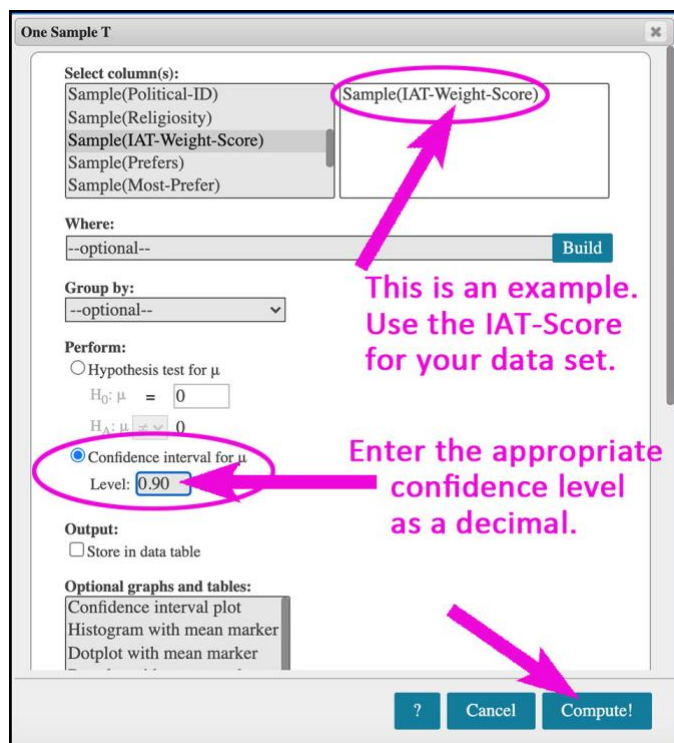
With your data set open in StatCrunch, select **Stat** → **T Stats** → **One Sample** → **With Data**.



STEP 2

The **One Sample T** window is now open.

- Under the **Select column(s):** heading, select the appropriate quantitative variable in the gray box on the left. The variable should now appear in the white box on the right.
- Select the **Confidence interval for μ** button. Then enter the confidence level in the textbox.
- Click **Compute!**



ANOVA F-TEST STACKED DATA FORMAT

With the datafile open in StatCrunch worksheet:

- Select **Stat** → **ANOVA** → **One Way**
- Leave the white text area under the **Compare:** heading blank.
- Check the **Values in a single column** radio button. This activate the **Response in:** and **Factors in:** drop-down menus.
- Use the **Responses in:** drop-down menu to choose the column for the appropriate quantitative data. This is the response variable.
- Use the **Factors in:** drop-down menu to choose the column with the appropriate categorical data. This is the response variable (not the individual groups of the response variable).
- Press **Compute!**

ANOVA F-TEST UNSTACKED DATA FORMAT

With the datafile open in a StatCrunch worksheet:

- Select **Stat** → **ANOVA** → **One Way**
- Check the **Selected columns:** radio button, if it is not already selected.
- Under the **Compare:** heading in the gray box, select the columns containing the samples. These are the groups for the explanatory variable. (Note: you may need to hold down the CTRL or COMMAND key to select each group one at a time.)
- Press **Compute!**

CHI-SQUARE TEST FOR INDEPENDENCE (SUMMARIZED DATA)

These directions assume you are using summarized data to conduct the Chi-square test.

Open StatCrunch. You will not upload a datafile. With a blank worksheet open in StatCrunch:

- In column 1, click on the title *var1*. Replace on the title *var1* with the name of the explanatory variable. For example, if *Gender* is the explanatory variable, you will replace the title *var1* with *Gender*.
- Enter the categories (group names) for the explanatory variable in column 1. For example, if *Gender* is the explanatory variable, you would enter *Male* in row 1, column 1. And you would enter *Female* in row 2, column 1. Using *Gender* as the example, here is what the StatCrunch worksheet would look like.

StatCrunch	Applets	Edit	Data	Stat	Graph
Row	Gender	var2	var3	var4	
1	Male				
2	Female				
3					

- In the next columns we will record the responses.
 - In column 2, replace the title *var2* with a description of one value of the response variable. For example, if the response variable is *Drank Alcohol* with the values *yes/no*, you would replace *var2* with *Alcohol - Yes*. In this column enter the values of this response for each row. Using *Gender / Drank Alcohol* as the example, here is what the StatCrunch worksheet would look like.

StatCrunch	Applets	Edit	Indicates 77 males drank alcohol		
Row	Gender	Alcohol Yes	var3	var4	
1	Male	77			
2	Female	16			
3					

- In column 3, replace the title *var3* with a description of next value of the response variable. For example, if the response variable is *Drank Alcohol* with the values *yes/no*, you would replace *var3* with *Alcohol - No*. In this column enter the values of this response for each row. Using *Gender / Drank Alcohol* as the example, here is what the StatCrunch worksheet would look like.

StatCrunch	Applets	Edit	Data	Stat	Graph
Row	Gender	Alcohol Yes	Alcohol No	var4	
1	Male	77	404		
2	Female	16	122		
3					

Continued on the next page ...

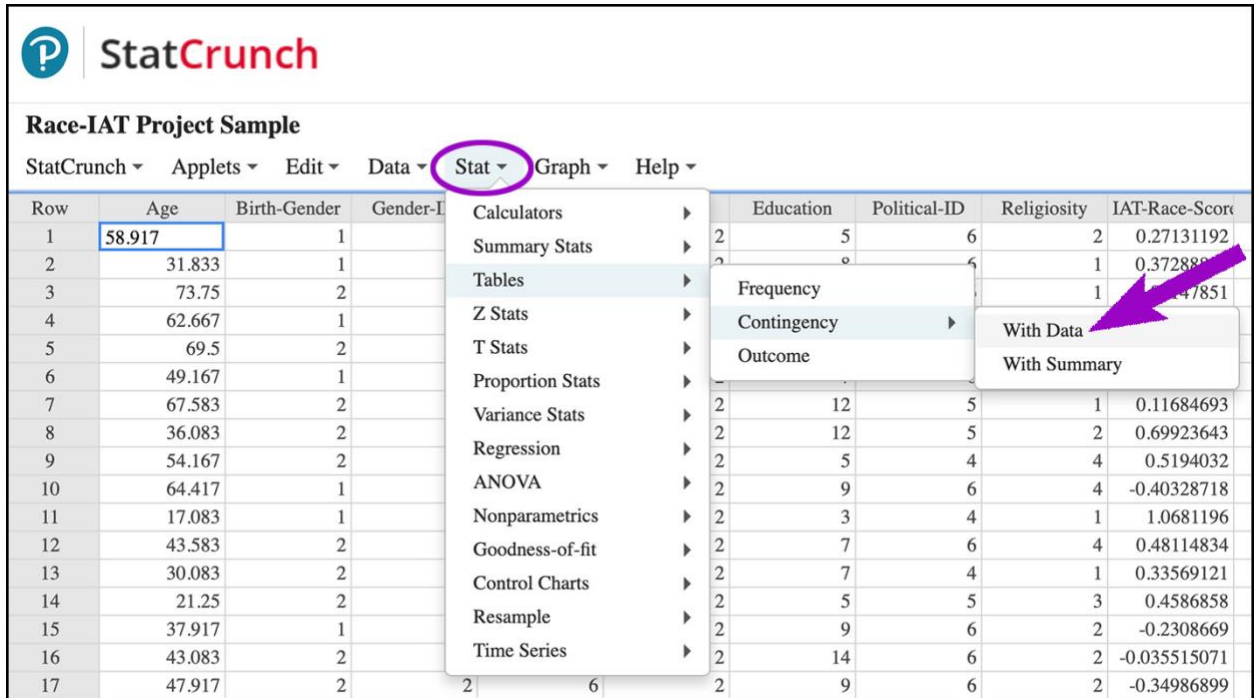
- Do not include the totals. Now we are ready to conduct the Chi-square test.
- Under the **Select column(s):** heading click on each group associated with the response variable. For example, if *Drank Alcohol* is the response variable, you would click *Alcohol Yes* and then *Alcohol No* one at a time to move each to the white box on the right. (Note: you may need to hold down the **ctrl** key or the **command** key to select groups.)
- Use the **Row labels:** drop-down menu to select the explanatory variable.
- Under the **Display:** heading select **Expected Count**
- Under the **Hypothesis tests:** heading select **Chi-Square test for independence**
- Press **Compute!**

CHI-SQUARE TEST FOR INDEPENDENCE WITH ROW DATA

These directions assume that you have a data spreadsheet open in StatCrunch.

STEP 1

- Select **Stat** → **Tables** → **Contingency** → **With Data**.



The screenshot shows the StatCrunch web interface. The 'Stat' menu is open, and the 'Tables' option is selected. The 'Contingency' submenu is open, and the 'With Data' option is highlighted with a purple arrow. The background shows a data table with columns: Row, Age, Birth-Gender, Gender-I, Education, Political-ID, Religiosity, and IAT-Race-Score. The first row of data is highlighted.

Row	Age	Birth-Gender	Gender-I	Education	Political-ID	Religiosity	IAT-Race-Score	
1	58.917	1		2	5	6	2	0.27131192
2	31.833	1		2	5	6	1	0.372888
3	73.75	2		2	5	6	1	0.47851
4	62.667	1		2	5	6	1	0.11684693
5	69.5	2		2	5	6	2	0.69923643
6	49.167	1		2	5	6	4	0.5194032
7	67.583	2		2	9	6	4	-0.40328718
8	36.083	2		2	3	4	1	1.0681196
9	54.167	2		2	7	6	4	0.48114834
10	64.417	1		2	7	4	1	0.33569121
11	17.083	1		2	5	5	3	0.4586858
12	43.583	2		2	9	6	2	-0.2308669
13	30.083	2		2	14	6	2	-0.035515071
14	21.25	2		2	9	6	2	-0.34986899
15	37.917	1						
16	43.083	2						
17	47.917	2						

Continued on the next page

STEP 2

- Use the **Row variable:** drop-down menu to select the explanatory variable.
- Use the **Column variable:** drop-down menu to select the response variable.
- In the **Display:** section, select **Row percent** and **Expected count**. After selecting **Row Percent**: PC users hold down **ctrl** and click **Expected count**; Mac users hold down **command** and click **Expected count**.
- Click **Compute!**

Contingency table (with data)

Row variable: Explanatory variable.

Column variable: Response variable.

Where: Build

Group by:

Display:

- Row percent
- Column percent
- Percent of total
- Expected count
- Contributions to Chi-Square

Hypothesis tests:

- Chi-Square test for independence
- Fisher's exact test for independence (2x2 only)
- McNemar's test for marginal homogeneity (2x2 only)
- Cramer's V test for association
- Mantel-Haenszel (group by with 2x2 only)

Confidence intervals:

- Lambda
- Uncertainty coefficient

? Cancel Compute!