Instructions:

Your group will be assigned one of the research questions below. Each group will prepare a poster. Your instructor may also require each group member to write an analysis and submit it individually.

This project requires you to learn some new StatCrunch moves. See instructions at the end of this assignment.

Your poster will include the following:

- Names of group members
- Your sample proportion with a pie chart or bar chart
- StatCrunch output (include ALL of the information from the printout)
- Explanation of all of the numbers in the StatCrunch output
- Sketch a normal curve using p as stated in the cited study with SE from the StatCrunch output
- For confidence intervals:
    - A sketch of the confidence interval appropriately located below the normal curve.
    - An answer to the research question that interprets the confidence interval in terms of the population of StatCrunchU students
    - An explanation of the meaning of "95% confident"
- For hypothesis tests:
    - P-value shaded in the normal curve
    - An answer to the research question that draws a conclusion from the hypothesis test in terms of the population of StatCrunchU students
    - An interpretation of the P-value as a probability statement about random samples of 1000 StatCrunchU students

StatCrunch instructions are at the end of this assignment.

Option 1: Hypothesis test
According to the CSU Mentor, about 87% of CSU East Bay undergraduates are full-time students. "Full-time" is defined as taking 12 or more units in a semester. Is the proportion of StatCrunchU students who are full-time less than 87%?
Source:
http://www.csumentor.edu/campustour/undergraduate/9/csu_east_bay/csu_east_bay5.html

Option 2: Confidence interval
What proportion of StatCrunchU students are full-time students? "Full-time" is defined as taking 12 or more units in a semester.

Option 3: Hypothesis test
According to a 2015 report from Georgetown University's Center on Education and the Workforce (CEW), more than 70% of college students work.
Source: https://cew.georgetown.edu/wp-content/uploads/Press-release-WorkingLearners_FINAL.pdf

Is the proportion of StatCrunchU students who work different from the 2015 CEW national estimate?

Option 4: Confidence interval
What proportion of StatCrunchU students work?

Option 5: Hypothesis test
According to the Institute for College Access and Success, in 2015 68% of college graduates have student loan debt.
Source: http://ticas.org/posd/map-state-data

Is the proportion of StatCrunchU students with loans different from the 2015 College Access and Success estimate?

Option 6: Confidence interval
What proportion of StatCrunchU students has student loans?

Option 7: Hypothesis test
According to the U.S. Department of Education's National Center for Education Statistics, 41% of graduating seniors had credit card debt in the year 2000.
Source: http://www.pirg.org/highered/BurdenofBorrowing.pdf

Is the proportion of StatCrunchU students with credit card debt greater than the U.S. Department of Education's estimate for the year 2000?

Option 8: Confidence interval
What proportion of StatCrunchU students has credit card debt?

Instructions for accessing your data:
To access StatCrunchU, log into StatCrunch and click on **Resources**. Scroll down to the heading **Take a sample from StatCrunchU** and click on **StatCrunchU**.

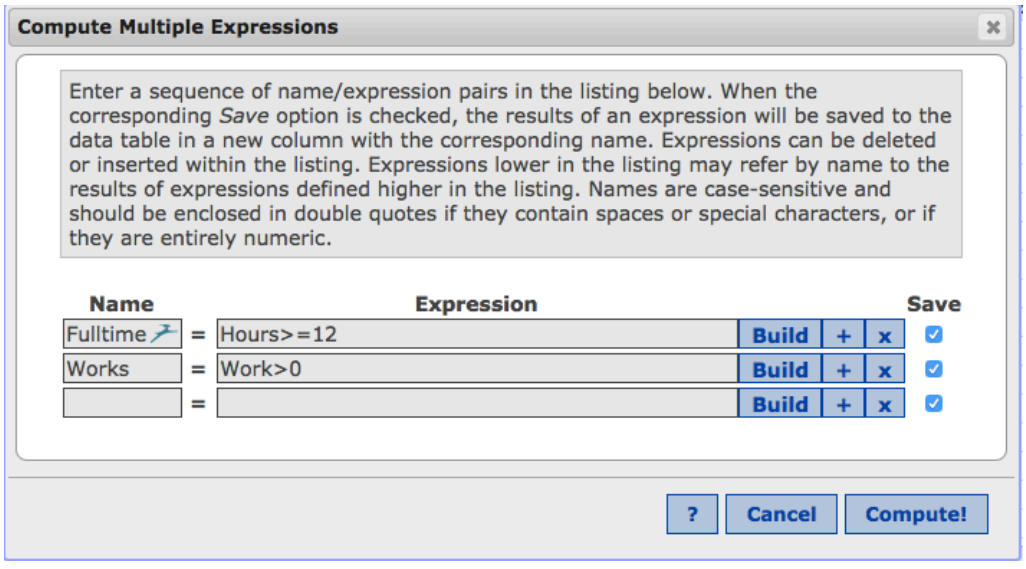
You will see a student survey with 6 questions. This is a fictitious survey that was answered by each of the 46,000 fictitious students at StatCrunch U.

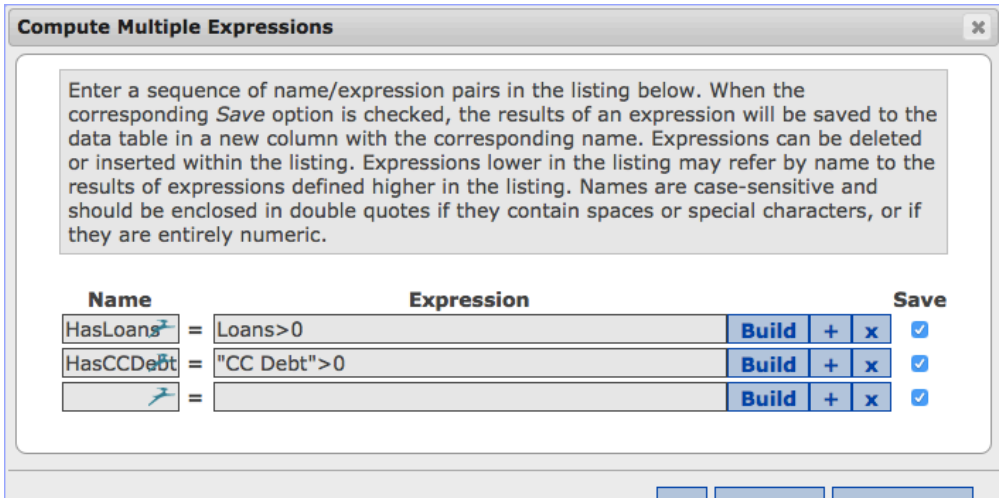
Below the survey you can set the sample size. Set this to 1000 and click Survey. A spreadsheet will appear with the survey results for your random sample of 1000 StatCrunchU students.

Instructions for creating a new variable:
All of the research questions in this lab involve proportions. Proportions summarize categorical data. However, most of the data in the spreadsheet is quantitative. For example, credit hours, work, loan debt, and credit card debt are all quantitative variables. Therefore, for all of the research questions in this project, you will need to convert the quantitative data into categorical data.

We will create additional columns in the spreadsheet to accommodate the necessary categorical variables for our analyses. An easy way to create one (or several) categorical variables, each based on values in a quantitative variable, is to use the Compute Multiple Expressions feature. The next several screenshots will walk you through the procedure.

Choose `Data >> Compute >> Multiple Expressions`
The following two images show how to fill in the Multiple Expressions form for all of the 8 options in the Project. The first image shows how to create the new categorical columns for Options 1 – 4 (fulltime students and students who work), and the second image shows how to create the categorical columns for Options 5 – 8 (students with loans and students with credit card debt).





Here's what is going on in these two images from StatCrunch. Under the Expression headings, StatCrunch is creating a new temporary logical variable with values true or false according to whether the value in the corresponding spreadsheet column is positive. It then assigns the logical value (true or false) to the variable given under the Name heading. For example, in the first row of the form directly above, each row in new spreadsheet column HasLoans is assigned the value **true** if the value in Loans is positive. Otherwise HasLoans is assigned the value **false**. (note: the quantitative variable CC Debt is placed inside double quotes because it contains an embedded blank)

The resulting spreadsheet from StatCrunchU, complete with the 4 new Categorical variables, appears below. The first several columns have been scrolled off of the screen to make room for all four of the new categorical variables. Remember: the data in your sample of 1000 students will differ from that shown below.

statcrunchusample.php

StatCrunch | Applets | Edit | Data | Stat | Graph | Help

Row	Work	Loans	CC Debt	Fulltime	Works	HasLoans	HasCCDebt	var11
47	0	16554	2892	true	false	true	true	
48	21.5	0	0	true	true	false	false	
49	12.5	0	999	true	true	false	true	
50	0	0	5417	true	false	false	true	
51	33	11931	0	false	true	true	false	
52	23.5	8122	2599	true	true	true	true	
53	0	0	0	true	false	false	false	
54	0	3909	0	true	false	true	false	
55	0	10848	0	true	false	true	false	
56	30.5	0	5384	false	true	false	true	
57	12.5	11694	2974	true	true	true	true	
58	11.5	0	2512	true	true	false	true	

Instructions for finding a confidence interval or conducting the hypothesis test

- Choose Stat, Proportion Stats, One sample, With data
- In the pop-up window titled One Sample Proportion enter the following:
    - **Values in:** choose the variable you created
    - **Success:** type the variable value, such as Job or Debt.
    - **Where:** leave this blank
    - **Group by:** leave this blank
    - **Perform:** click either Hypothesis test OR Confidence interval
    - For the hypothesis test, enter the hypothesized p and the correct Ha.
- Hit Compute!