

Practice doing all of these using StatKey:

- hypothesis test on a single population proportion
- confidence interval for a single population proportion
- hypothesis test on a difference of two independent proportions
- confidence interval for the difference of two independent proportions

Find additional information about using StatKey here: www.maryparker.org/stat/StatKey/

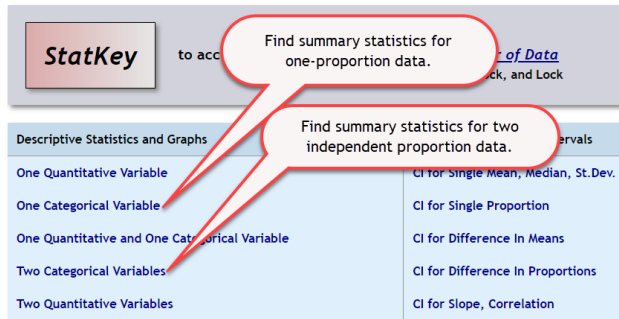
Suggestions:

1. Redo the examples in the lectures. Do you know why you didn't get exactly the same results as in the lectures? How close do you expect?
2. **Do at least eight additional problems (2 of each of the four types.)** Here are suggestions for various different ways to do that.

Ideas (a) and (d) below require that you get together with at least one other person and agree to do the same problems so that you can compare your answers and discuss.

- a. Think of a proportion question and make up some data that seem reasonable to you for it. (Notice that all you need is the "number of trials" and "number of successes.") Share your problem with others in your study group. Are the solutions you find consistent with what others find? The following examples illustrate how easily you can make up problems to solve.
 - i. Example 1: We have a random sample from a population where the sample size is 52 and the number of successes is 31. Find a 90% confidence interval for the population proportion.
 - ii. Example 2: We have random samples from two populations and we want to test the claim that the population proportion in Population A is larger than the population proportion in Population B. In the sample from population A, there are 22 successes from 88 trials. In the sample from population B, there are 15 successes from 68 trials. Write the hypotheses and use StatKey to find the p-value.
- b. Using some applied statistics text, find an example or exercise of each of these and do it. How closely did your results match those in the text?
- c. Use these exercises from our recommended textbook: Exercises: Sec. 3.4: 3.127, 3.129, 3.133, 3.135 and Sec. 4.2: 4.77, 4.89, Sec. 4.3: 4.129. For information on signing up for this textbook, see <http://www.maryparker.org/stat/381/before-class.html> and, at the end of that page, a link to information and using StatKey
- d. Look at the dataset link from www.lock5stat.com. (Find descriptions of the datasets in a pdf file from the very end of that page.) Find an interesting dataset with some variable appropriate to test a claim or estimate a single proportion or the difference of two proportions. Then do these

problems. For hypothesis tests, write the hypotheses as well as find the p-value. .



3. Notice some of the challenges you face in doing the four types of problems.
 - a. How can you determine whether a question is about a population mean or a population proportion?
 - b. How can you determine whether a question is about a difference of two independent proportions rather than a question about a single proportion?
 - c. Where can you find help with these?
Answer: Undergraduate students in elementary statistics courses often have difficulty with this, but it isn't clear how much students in this course need help. Various resources are available. Just email us to ask.
4. When we resume statistics in Week 10 (after covering probability on continuous random variables) you'll be expected to quickly learn to answer the same types of questions as these on the various other parameters - all the types shown in the main StatKey menu. The Lock textbook can be helpful in learning or reviewing all the basic ideas of statistics, with excellent explanations and many examples and exercises with solutions. It includes the usual "theoretical distribution" statistics methods as well as a quite thorough coverage of simulation-based methods for answering all the types of questions shown in the StatKey menu.

However, you do not need the Lock book to learn to use StatKey. The Lock book itself does not give directions for using StatKey - that is explained in various documents found from the link about StatKey in the last line on this website: <http://www.maryparker.org/stat/381/before-class.html>.

Most of you will have learned about the ideas and practiced confidence intervals and hypothesis tests that from texts using only "normal-theory" methods instead of including simulation-based methods.

- a. You can use re-sampling methods to do the proportion problems from those texts, because you only need the summary statistics from the data - the sample size and the count of successes. Those two numbers give us all the information that is in the dataset for proportion problems.
- b. To re-sample to solve problems using quantitative variables requires the entire dataset, not just summary statistics (which is all that is necessary to do the usual normal-theory calculations.) So you'll need to practice your re-sampling skills only on the problems for which you have the entire dataset.