

Homework 2

Math 445, Spring 2017

Due Wednesday, April 12 by 4:30 p.m.

Instructions

- If you need to review concepts from probability, Appendix A is a good place to start.
- Please complete problems that require the use of R in R markdown. Theoretical problems may be handwritten. Please knit your .Rmd file to either Word or PDF and print it for submission with the remainder of the problems.
- All assignments should be stapled.
- Remember that the textbook data sets are contained in the **resampled** R package.
- When completing a hypothesis test, be sure to outline all of the steps in your solution.

Assignment

Complete the following exercises from **Chapter 3** of the textbook:

Exercise 4

- Hint: Proportions can be thought of as the mean of a binary variable, and in R, **TRUE** and **FALSE** map to 1 and 0, respectively; thus, you can find a proportion by using code of the form:
`mean(variable >= "condition")` (you need to substitute in the name of the variable and the condition). You can substitute other logical operators in for `>=` as necessary (run `?Comparison` in the console for details).

Exercise 5

- For this problem you should only write **one for loop** inside which you calculate three statistics. This will require that you initialize three result vectors.
- This problem is illustrating what Theorem 3.1 establishes.

Exercise 12

Exercise 16

Exercise 19

Exercise 20

Exercise 22

- This is one of the rare times that I recommend you count values by hand to reinforce the concept.

Exercise 26

- This problem will help you review a bit of probability theory and make connections from Math 240 to this course.

Exercise 28

- The variance of the p-value is of interest as it can be used to understand how much our simulated p-values will vary from simulation to simulation.