Homework 1

STAT 625 Fall 2022

Due September 13, 2022, 12:30pm

1 Reading

- Finish reading Chapter 1 of the text.
- Read Chapter 2 of the text.

2 Actions

1. **Learn about R:** Students are entering this class with different levels of R experience. There are two ways to complete this question:

   i) If you are new to R or want a refresher, use Chapter 0 pages 1-31 of the Computing Primer here and at least pages 1-14 of Chapter 1 of the supplemental text available online here: https://www.sagepub.com/sites/default/files/upm-binaries/38502_Chapter1.pdf. To do this, I recommend using `File -> New -> RMarkdown` to create a new file for this exercise. Type the code in the new `RMarkdown` file and execute it. You should type in and execute most of the code in this section. You do not need to turn in all of this code or output.

   ii) If you are comfortable with the basics of `R`, use this opportunity to learn about a new part of `R`. Find another package you are interested in working with, find a tutorial on it, and do that tutorial. You may choose whichever package is most interesting to you. If you do not have experience with them I recommend `ggplot` or `tidyverse` or `kableExtra` or `Shiny`.

   To answer this question on your homework, write 'I did the tutorials listed' or 'I looked at the tutorials and I am comfortable with all of it, then did a tutorial on package X, which taught me how to do Y' or an appropriate honest variation reflecting that you are now comfortable with the basic material in these tutorials, and have also learned something.

2. Weisberg problem 1.1 (3 parts)
3. Weisberg problem 1.5 (1 part)
4. Weisberg problem 1.6 (1 part)
5. Give mathematical expressions for $\hat{\beta}_0, \hat{\beta}_1, SXX, SXY, SYY, \hat{\sigma}^2$ for simple linear regression with $y = y_1, y_2, \ldots y_n$ and $x = x_1, x_2, \ldots x_n$.

All questions should be answered in **RMarkdown** and turned in as a `.pdf` on **gradescope**. Remember to indicate on which page to find each question.

3 Pre-lecture Check

Complete this week's timed pre-lecture check (covering chapter 2) on **gradescope**.