**Psych 610/710**

**HW 4, Due 4 October, 2017**

Answer reading questions in your Word doc, data analysis and corresponding short answers in your R script (unless otherwise noted). Send to both TAs by Wednesday at 5:00pm of the form “Lastname\_HW4.”

**Reading questions**

1. Thinking about sampling procedures: The idea that the mean is the most efficient estimator for a given sample relies on what core assumption?
2. Thinking F: According to your text book, what are the two reasons for calculating F?
3. Thinking terms: In a simple model that predicts the mean, the mean squared error is also known as what?
4. Thinking terms: In a simple model that predicts the mean, the square root of the mean squared error is also known as what?

**Data analysis**

HW4\_Data.dat contains data for 96 participants that were in an experiment designed to assess alcohol’s effects on participants’ anxiety to stressors. Before any participant was adminstered alcohol, participants had electrodes hooked up to the fingers of one of their hands and were asked how anxious they were (0 to 6 scale) about a mild electric shock that there going to receive in just a few seconds (d$AnxBase). Then, the participants were divided into two beverage groups (d$BG). Half of the participants were given an alcoholic drink designed to bring them to a blood alcohol level of about .08 (coded as 1). The other half of the participants received a non-alcoholic drink (coded as 0). After consuming their beverages, participants were asked again how anxious they were (0 to 6 scale) about receiving the upcoming shock (d$AnxTest). You will do analyses to see if consuming an alcoholic drink lowered participants anxiety about receiving the upcoming electric shock.

1. Read in and run descriptive statistics on the data overall and by each Beverage Group.
2. Notice that there are three “Annoying” variables that we do not need for these analysis. Using bracket notation, remove those variables while also sorting the order of the variables (columns) in an order that makes sense to you. Run an R command that shows the names of what variables are left.
3. First you should test to see if the two beverage groups already differ on their anxiety about receiving a shock before receiving their respective beverages (at baseline). Fit a linear model to test this question. Report the corresponding *t-*statistic, *df* and *p*-value and describe the result of the model in words.
4. From the output of that same linear model that you just ran, interpret the “intercept” or b0 coefficient. What does it mean in this sample? What does its corresponding *p* value mean?
5. Create a publication-quality bar graph that shows level of anxiety in each beverage group at baseline. Make sure you label each axis.
6. Fit a linear model predicting anxiety (not baseline anxiety) from beverage group. Test if beverage group significantly predicts anxiety (report *t*-statistic, *df*, and *p*-value) and provide a 95% confidence interval for the parameter estimate. Describe the effect of beverage group on anxiety in a sentence in your script.
7. Report *ηp2* (PRE) along with its interpretation in a sentence to describe the effect of beverage group.
8. Create a publication-quality bar graph that shows level of anxiety in each beverage group. Make sure you label each axis.
9. In your Word document, write a concise results section (a few sentences). Explain the hypothesis you tested, the statistical results of your test, and the practical interpretation of the result. Write for an audience who doesn’t know anything about these data.
10. At the bottom of your script write the number of hours you spent working on this homework assignment.