**Assignment #2  
Due: June 22, 2022**

**This is due prior to the beginning of live session on the due date. Use this document to answer questions. Include the questions with answers and highlight answers. Copy and paste relevant software output into this document in your answer. Software is only required to be used where indicated. Please submit as a word document or pdf.**

**Please identify any students you worked with on this assignment.**

1. [Week 4] Assume a normally distributed population of resting heart rates with μ = 76 and σ = 5.
   1. Compute the standard error for a sample size of 10.
   2. What does the standard error measure?
   3. What is the probability of selecting a random sample of 10 individuals whose mean heart rate is below 73?
   4. What is the probability of selecting a random sample of 20 individuals whose mean heart rate is below 73?
   5. What is happening to the probabilities as the sample size increases? Briefly explain why.
2. [Week 5] According to ETS, the Graduate Record Exams (GRE) quantitative section has a population mean of 152.6 and population standard deviation of 8.8. Suppose a test prep company claims that test takers who have taken their quantitative prep courses score higher on the quantitative section. To evaluate the claim, you decided to take a random sample of 48 individuals who took the quantitative prep courses. You calculated the mean GRE quantitative section of the sample to be 155. For the following questions, assume we are conducting a two-tailed hypothesis test at an alpha = .05 level.
   1. Write the null hypothesis in symbols and words
   2. Write the alternative hypothesis in symbols and words
   3. Calculate the test statistic
   4. Compute the p-value using software
   5. Make a decision about the null using the critical value approach
   6. Make a decision about the null using the p-value approach
3. [Week 5] Suppose in the last question we decided to use a one-tailed test instead of a two-tailed test.
   1. Rewrite the alternative hypothesis (in words and symbols) to reflect a one-tailed test
   2. What would the p-value be?
   3. What decision would you make?
   4. Does this agree with the decision from the two-tailed test?
4. [Week 6] A quality control division at a company is responsible for ensuring the weight of packages meets standards. To do this, the division routinely measures randomly selected packages. A random sample of 35 packages, whose packaging states that the contents weigh 10 pounds, is collected and weights are recorded (see weights.xlsx). For the following questions, assume we are conducting a two-tailed hypothesis test and the alpha = .05 level.
   1. Write the null hypothesis in symbols and words
   2. Write the alternative hypothesis in symbols and words
   3. Compute the test statistic
   4. Compute degrees of freedom
   5. Use software to compute the p-value
   6. Make a decision about the null using the p-value approach
   7. Calculate Cohen’s d, if appropriate. If not, state why.
   8. Write the conclusion in APA style
   9. Explain what a Type I and Type II error would mean \*in the context of this problem.\*