**Intermediate Statistics DA4**

**Submit:** Knitted.Rmd file from any analysis you run and responses to the following questions. You can combine your knitted code with your responses into 1 file or submit 2 separate files.

1. Interpret a p-value of .042. (This question is **not** asking for the decision this p-value results in, rather what does this value mean?)
2. ***In no more than two sentences,*** what is the relationship between sample size, effect size, and power?
3. A researcher records the number of words recalled by students presented with a list of words for 1 minute. In one group, students were presented with the list of words in color; in a second group, the same words were presented in black and white. An equal number of students were in each group. The researcher reports the following: *Participants recalled significantly more words when the words were presented in color (M = 12.4 words) versus black and white (M = 10.9 words), t(48) = 2.01, p = .035, d = 0.18.* Based on the previous statement, what is the sample size in each group?

**Questions 4-9 refer to the prompt below:**

You are teaching your first Intro to Psychology course! After the midterm, you are disappointed with your students’ overall test scores. You decide to implement two different required study techniques. There are 100 students in the class; 50 of them will be required to meet in groups to study right before the final (Group A) and the other 50 will be required to create flashcards to aid in memorization (Group B). You are interested in two primary research questions:

**Questions 4-6 refer to RQ1: Did student test scores improve significantly from the midterm to the final? Data: 308A.RQ1 Data.DA4.csv**

1. Visualize your data for this research question. Include your visualization here.
2. Did student test scores improve significantly from the midterm to the final? Using RStudio to analyze, conduct a hypothesis test to evaluate this question. Organize your answer according to the 4 steps of hypothesis testing.
3. Report your findings in APA format. (Hint: make sure to answer the research question!)

**Questions 7-9 refer to RQ2: Does the study technique used predict scores on the final exam?**

**Data: 308A.RQ2 Data.DA4.csv**

1. Visualize your data for this research question. Include your visualization here.
2. Does the study technique used predict scores on the final exam? Using RStudio to analyze, conduct a hypothesis test to evaluate this question. Organize your answer according to the 4 steps of hypothesis testing.
3. Report your findings in APA format. (Hint: make sure to answer the research question!)
4. The Dean of the university was also interested in your results, as this may help to raise scores in other departments. Unfortunately, she does not understand statistical language. Please interpret your findings for the Dean. Did scores improve? Which technique is better?
5. A developmental psychologist is interested in the effect of a positive psychology intervention on the well-being of aging adults. She administers the intervention, collects well-being scores from a sample of 100 participants, and tests whether their well-being differs significantly from the national average. Using G\*Power, she determines the power for her test is .80.

a) Interpret this value

b) What suggestion would you give her if she wants a higher probability of detecting a true effect?

***Extra practice*** *(no points, just feedback)****:***

1. What would it mean if your analysis returned the following values? Consider the meaning of t - not the decision associated with it.
   1. *t*(24) = 0.35
   2. *t*(24) = 1.00
   3. *t*(24) = 3.24
2. Draw and annotate all the properties of the null and alternative curves: power, beta, alpha, type 1 error, type 2 error.