**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**NOTE: Type your answers in the appropriate fields; please make answer fields larger as needed. Please turn in a printed copy to Joe during next Friday’s lab or Melissa’s mailbox by 12 PM next Friday (please contact Melissa regarding exceptions; e.g., illness and travel). Please note, assignments will lose 5% of the total possible points for each day they are late.**

*Conceptual Questions*

1. What is the formula for *SE*? What is the relation of *SE* with *SD*? How are these two measures similar, how are they different?.
2. All things being equal, what factors influence power? Why does it make sense that these factors influence power? Use the *t*-test formula to help explain why these factors logically influence power.
3. Describe in your own words how z- and t-distributions are used to test null hypotheses. That is, what does the distribution represent, and how do qualities of the distribution help us evaluate differences between means?

*Computational Problems*

Use the data set HW03Data.csv.

1. A researcher collected three large samples (N = 3,000 each) of undergraduate students from UC Davis, UC Merced, and UC Los Angeles; *davis*, *merced*, and *la*, respectively. The collective wisdom is that anxiety levels between campuses follow a normal distribution, but that some schools may elicit more or less anxiety in their undergraduate population. Your task is to compare these samples using independent samples *t*-tests. Specifically:

a. Gather mean, median, and *SD* summary statistics about these samples. Table your results. Using these summary statistics, does there appear to be a difference between campuses with respect to undergraduate anxiety?

b. Conduct independent samples *t*-tests comparing each campus to the other. In a paragraph, summarize the results of the *t*-tests using APA format. You should report the statistical tests, interpret their meaning, and report your conclusions with respect to the research question.

\* In addition to APA formatted reporting of the *t*-test results, please include the 95% CI for each test.

\*\*Note: For those of you with more statistical experience do not worry about inflated type I error rates due to multiple *t-*tests; we’ll address this later in the quarter.

Code/Syntax:

Answer:

5) It’s useful to include a figure that depicts variable differences between groups. In this situation, there were two expectations: 1. that the average amount of anxiety differed between groups, and 2. that the distribution of student anxiety for each campus is normally distributed. To depict this create a single figure with 3 panels (3 rows and 1 column). Each panel should be a plot of the density of student anxiety. Make sure you generate a main heading, and x- and y-axis labels. Also, each of your final figures should have the same x-axis range and a dotted vertical line at the mean of each sample; this will help visualize comparisons between the campuses. Describe these distributions with respect to the two expectations in this study and your *t*-test results.

Code/Syntax:

Answer: