**BIOS 543 GRADUATE RESEARCH METHODS I**

**HOMEWORK 3**

**DUE TUESDAY, OCTOBER 25, 2022**

Directions: Your completed homework is due at the beginning of class on the date listed above. Compose your responses to the problems listed below electronically (e.g., Microsoft Word) and print. This assignment is subject to the VCU honor code: you may collaborate with other students, but your homework must be the product of your own efforts and understanding.

The data for this assignment are stored in an excel file entitled “HW3\_Data.csv”, which contains measures from a study comparing health outcomes between cancer patients treated with or without antithymocyte gobulin (ATG). Use the data within this file to conduct the following:

1. Say we have the following research question: is mean CD34 different between the ATG and No ATG groups?
   1. Translate this research question into a set of testable hypotheses in symbolic form.
2. Assess the assumptions needed to test this hypothesis.
   1. Visualize the distribution of CD34 values for each group.
   2. If appropriate, compare the variability between each group.
   3. Comment on whether the assumptions are satisfied.
   4. Based on your assessment, state unequivocally which test you are conducting.
   5. State which functions in R/RStudio you’re using for each task.
3. Summarize the variable CD34 for each group.
   1. Use appropriate measures of center and variability.
   2. If appropriate, calculate 95% confidence intervals.
4. Perform the hypothesis test.
   1. If appropriate, report the difference and its 95% confidence interval
   2. Report the relevant statistics from performing that hypothesis test.
   3. State your conclusion from these findings.
5. Extra Credit
   1. Test whether survival (via the “Death” measure) is equal between the ATG and No ATG groups. Report only the three sentences of the results.

Write-Up Instructions:

* This assignment should be written as a single, comprehensive narrative.
* Each of the above questions should be written as a single paragraph, with responses to particular components written in at least one complete sentence.
* This write-up should include at least one figure, with a short title and clearly labeled axes. You need to make clear reference to this figure in your narrative.
* “Solo” statistical estimates can be place directly into your sentences if you don’t have a place for them in a table.
* Please copy your R script into the end of this document.

Write-Up Guidance:

* Please review the IMRD information provided in the Course Sections/IMRD Guides section of the Blackboard course page.