STAT 415615 HOMEWORK MULTIPLE REGRESSION (INTERACTION)

Instructions: Submit all comments, code, and required output in an RMarkdown File and a Word File. This assignment is to be uploaded to Canvas.

1) Run the following R code

library(Tidyverse) mtcars

2) In the mtcars data table, define or describe each variable abbreviation(one sentence for each variable).

**mpg**, **hp**, **wt**, and **disp**

3) Use and show R code to determine if their exists multicollinearity problems among any of the explanatory variables.

4) Use and show R code to generate a full regression model that features **mpg** as the response variable. The explanatory variables are **hp**, **wt**, and **disp**.

5) Use and show R code to build a 95% confidence interval and a 90% confidence interval for the true coefficient for **wt.** (These are two separate problems. Show all of your work. Provide and interpretation for each interval)

6) It has been determined that there is interaction involving the variables hp and wt.

a) Produce a full model that includes the interaction term hp : wt.

b) Show and use R code to determine if the interaction term is significant at the .05 level.

c) What value in your output tables indicates the percentage of variability of the response variable that is explained by the model using only explanatory variables that have significant impact on the response variable?

d) Also for this interactive model, explain why or why not the null hypothesis (Ho :: all explanatory coefficients = 0) should be rejected.