QMM 1002 Module 7 Assignment   /32

Create and submit an R script which, when run, will print the answers to the following questions. Your R script must include a title with your name and student number and comments for each question number.

1. You are employed at a large agricultural company. This company produces two species of grass, and would like to know which type to grow in Northern Ontario. They would also like to know which of their three fertilizers is most effective for that grass. The company conducts an experiment in a large patch of soil in Northern Ontario. The patch is divided into 30 regions, and 5 are randomly selected for each grass/fertilizer combination. After several months, you determine the number of blades of grass per square inch in each region. The data is given in the file *"Grass.csv"*.
   a) State the null and alternative hypotheses. (4 marks)
   b) What type of experiment is this? (1 mark)
   c) How many different treatments groups are there? (1 mark)
   d) What is the response variable? (1 mark)
   e) Create three groups of boxplots: number of blades by species, number of blades by fertilizer, and number of blades by both species and fertilizer. Are there any outliers? Do you notice any patterns from the boxplots? Explain. (5 marks)
   f) Conduct a two-way analysis of variance at the $\alpha = 0.05$ level. Print a summary of the completed ANOVA table. Interpret the results in terms of the hypotheses. (5 marks)
   g) Are the homogeneity of variance and normality conditions satisfied? (2 marks)
   h) Create an interaction plot (Hint: use fertilizer on the x-axis). Explain any patterns that you see in terms of the main effects and interaction. (4 marks)
   i) Perform a Tukey HSD Test. Interpret any significant values. (4 marks)
   j) Which species/fertilizer combination would you recommend? (1 mark)
   k) Create bar plots with error bars for both of the main effects. Interpret the results of the plots (4 marks).

Save your R Script as: Last Name, First Name Module 7 Assignment

Upload your R Script to the "Module 7 Assignment" drop box on Moodle before March 1st at 11:59 PM.