

QMM 1002 Module 6 Assignment

/26

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. **(12 marks)** A pharmaceutical company has developed a new drug that they believe increases focus and attention. To test this hypothesis, the company obtains 27 volunteers and randomly assigns 9 to each of three groups. The first group receives a placebo. The second group receives 50mg of the drug. The third group receives 100mg of the drug. After taking the treatment, participants complete a computerized focus task to measure their level of focus and attention. The percentage accuracy for each participant is shown in the table.

- State the null and alternative hypotheses.
- Perform a one-way ANOVA in R and print out the completed table.
- Determine the critical F value.
- At $\alpha = 0.05$ what do you conclude? Interpret your result.
- If you rejected the null hypothesis, perform Tukey's HSD test. Interpret your result.

Placebo	50mg	100mg
81	92	86
80	86	93
72	87	97
82	76	81
83	80	94
89	87	89
76	92	98
88	83	90
83	84	91

2. **(14 marks)** John is looking to invest in the Canadian Stock Market. In particular, John wants to maximize his received cash flows, so he would like to invest in companies that have a high dividend per share ratio. Load the *FinanceCanada.csv* dataset. This contains randomly chosen Canadian companies sorted into seven industry groups (1=real estate, 2=financial, etc), along with a variety of financial metrics. To direct his investing, John would like to test whether certain types of industries have on average a higher dividend per share ratio.

- State the null and alternative hypotheses.
- Run a one-way ANOVA at $\alpha = 0.05$. Print out the ANOVA table, make a decision, and interpret your result. (HINT: we want to use TypeOfIndustry as a factor, but since the values are numeric (1 through 7) we must use the command `as.factor(TypeOfIndustry)` to treat it as a grouping variable)
- Check the independence, equal variance, and normal population assumptions. Explain if the assumptions are met or not (show and describe all plots that you create).
- Create a barplot of the mean dividend per share ratio for each type of industry. Include axis labels, a title, 95% error bars and colors from a chosen palette.

DUE: February 22nd, 2019 at 11:59 PM

Save your R Script as: **Last Name, First Name Module 6 Assignment**

Upload your R Script to the **"Module 6 Assignment"** drop box on Moodle before
February 22nd at 11:59 PM.