UNIVERSITY OF THE FREE STATE
DEPARTMENT OF MATHEMATICAL STATISTICS AND ACTUARIAL SCIENCE
STSM 2634

Tutorial 4

Full marks: 100 (all tutorials together)

Date: 08 May, 2025

Deadline: 09 May, 2025

FOLLOW THESE INSTRUCTIONS METICULOUSLY, OTHERWISE MARKS WILL BE SUBTRACTED:

- Name the answer file as **'Tutorial4_student number'** as the file name. The **code and the output must be included in your answers**.

- **Submit the MS-Word file generated by R-markdown**. Any other form of submission will not be accepted.

- You have freedom to write the code in your own way.

- **No need to print unnecessary long data/output.**

- You are allowed to use the class notes, or any other help from the internet.

- All computations must be done with the help of suitable R functions. Manual or calculator-based answers will not be accepted.

- 0 marks for no submission.

Q1. Consider the ‘mtcars’ data in R. A data analyst used machine learning tools and concluded:

“Cars with higher horsepower tend to have lower fuel efficiency (measured in miles per gallon, mpg). This may be because high-performance engines consume more fuel.”

Do you agree with this claim? Critically evaluate it using the following:

1. **Graphical/visualization tools**
2. **Correlation analysis**
3. **Linear regression odelling**

Use appropriate R code for each step and summarize your conclusion based on the results.

[4+3+3 = 10]

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