Lab Assignment 3

We are interested in the relationship between miles per gallon (`mpg`) and the displacement of the car (`disp`). The engine displacement is the measure of the cylinder volume.

Instructions:

1. Load the `mtcars` dataset into `R` and inspect its structure.

2. Run a simple linear regression model using `disp` as our independent variable to predict `mpg`.

3. Visualize the relationship between our variables (`disp` vs. `mpg`) to get an intuitive grasp of the data.

4. Check the Linearity and Homoskedasticity assumptions by plotting residuals versus fitted values and interpret the plot.

5. Check the Normality assumption by plotting the Histogram of residuals.

6. Check the Normality assumption by plotting the Q-Q plot of residuals.

7. Log-transform the independent variable `disp`, re-run the regression and interpret the coefficients.

8. Repeat Steps 3 to 6 and interpret the impact of the log-transform.

9. Log-transform both dependent `mpg` and independent variable `disp`, re-run the regression (log-log model) and interpret the coefficients.

10. Repeat Steps 3 to 6 and interpret the impact of the log-transform.