 **🧪 Lab**  | Exploring the mtcars Dataset

**OVERVIEW:** In this assignment, you will dive into the world of automotive data using the **mtcars** dataset available in the ggplot2 package. Similar to our previous lesson where we explored the preloaded **diamonds** dataset 💎, you will apply various data manipulation and visualization techniques to uncover insights and analyze automotive trends.

**DATA OVERVIEW:** The **mtcars** dataset contains data on various automobile models, including attributes such as miles per gallon (**mpg**), number of cylinders (**cyl**), engine displacement (**disp**), horsepower (**hp**), and more.

To learn more about the dataset, including a data dictionary, you can use the following R command: **?mtcars**.

INSTRUCTIONS: In your own R script file, please complete the following tasks:

1. **Selecting Columns:**
   * Use the **select()** function to choose only the columns **mpg**, **cyl**, **disp**, **hp**, and **drat**. Save the resulting dataframe as **selected\_cars**.
2. **Filtering Data:**
   * Filter the **mtcars** dataset to include only cars with more than 150 horsepower (**hp**). Save the filtered dataframe as **high\_hp\_cars**.
3. **Arranging Data:**
   * Arrange the **high\_hp\_cars** dataframe in descending order of miles per gallon (**mpg**). Save the arranged dataframe as **sorted\_cars**.
4. **Using the Pipe Operator (%>%):**
   * Rewrite the previous tasks using the pipe operator (**%>%**) to create a streamlined workflow.
5. **Adding a New Column:**
   * Use the **mutate()** function to create a new column named **mileage\_category** in the **mtcars** dataset. Classify cars with mpg greater than or equal to 20 as "High Mileage" and others as "Low Mileage".
6. **Grouping and Summarizing:**
   * Group the **mtcars** dataset by the number of cylinders (**cyl**) and summarize the average horsepower (**hp**) for each cylinder category.
   * Investigate and group another trend of your choosing!

### **SUBMISSION GUIDELINES:**

* Write R code to perform each task, including comments to explain your approach.
* Include the use of the pipe operator (**%>%**) where applicable.
* Create an R Script with comments explaining your findings, insights, and any patterns observed during your exploration.

### **ADDITIONAL RESOURCES:**

* [Data Manipulation with **dplyr** Cheat Sheet](https://rstudio.com/wp-content/uploads/2015/02/data-wrangling-cheatsheet.pdf)
* [Introduction to the Pipe Operator in R](https://www.datacamp.com/tutorial/pipe-r-tutorial)
* [Documentation on **mtcars** dataset](https://stat.ethz.ch/R-manual/R-devel/library/datasets/html/mtcars.html)

### **NOTE:**

* This assignment is designed to help you practice data manipulation techniques using the **mtcars** dataset in R.
* Feel free to explore additional functionalities beyond the specified tasks to challenge yourself! 📊