 **🧪 Lab**  | Analyzing Female Mice Body Weights

OBJECTIVE: Your mission is to use R to analyze the body weights of female mice on different diets. You'll apply statistical measures to understand trends and variations in the data.

DATA OVERVIEW: The dataset you'll be working with is about the body weights of female mice on different diets. The .csv file is attached to this assignment. The dataset contains two columns:

1. Diet: This column indicates the type of diet each mouse was on. For example, it might be 'chow' or other specific diet types.
2. Bodyweight: This column shows the bodyweight of each mouse in grams.

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

1. **Central Tendencies of Body Weights**
   * **Goal**: Discover key central tendencies in the body weights of the mice.
   * **Task**: Calculate the mean, median, and mode for the body weights.
   * **Action**:
     + Load the dataset into R.
     + Apply **mean()**, **median()**, and a custom function to find the mode for the Bodyweight column.
   * **Reflection**: Write about which measure (mean, median, or mode) you think best represents the bodyweights and why.
2. **Understanding Body Weight Variability**
   * **Goal**: Explore the variability in the body weights across all diets.
   * **Task**: Calculate the range, variance, and standard deviation for the body weights.
   * **Action**:
     + Use R’s **range()**, **var()**, and **sd()** functions on the Bodyweight column.
   * **Reflection**: Discuss what these measures tell you about the spread of body weights.
3. **Overall Data Summary**
   * **Goal**: Gain a comprehensive statistical overview of the dataset.
   * **Task**: Use the **summary()** function in R.
   * **Action**:
     + Run **summary()** on the entire dataset.
   * **Reflection**: Highlight any standout points from the summary, such as differences in weight across diets.
4. **Diet Comparison**
   * **Goal**: Compare body weights across different diets.
   * **Task**: Group the data by diet and calculate the average bodyweight for each diet group.
   * **Action**:
     + Utilize the dplyr package to group data and calculate mean body weights.
   * **Reflection**: Share insights on how diet might influence bodyweight based on your findings.

SUBMISSION: Create an R Script with comments explaining your findings, insights, and any patterns observed during your exploration.