Seaborn Assignment 1

(Case Study)

Note: Dataset

# Load the penguins dataset penguins = sns.load\_dataset("penguins")

1. **Relationship Between Body Mass and Flipper Length Across Species**
   * Plot the relationship between body\_mass\_g and flipper\_length\_mm for different species.
   * Use **axis-level** and **figure-level** versions of sns.scatterplot and sns.relplot.
   * Highlight differences between the species using color.
2. **Trend of Body Mass by Island**
   * Show how the average body\_mass\_g varies across island.
   * Use **line plots** (both sns.lineplot and sns.relplot).
   * Add error bars to the plot to represent variability.
3. **Comparison of Body Mass Across Species**
   * Create a bar plot to compare the mean body\_mass\_g for each species.
   * Use both sns.barplot (axis-level) and sns.catplot (figure-level).
4. **Distribution of Flipper Length by Species and Gender**
   * Create a **box plot** and a **violin plot** to compare flipper\_length\_mm across species and sex.
   * Use sns.boxplot/sns.violinplot and sns.catplot.
5. **Count of Penguins by Species and Island**
   * Show the count of penguins for each species on different islands.
   * Use a **count plot** with sns.countplot and sns.catplot.
6. **Correlation Heatmap for Numerical Features**
   * Compute the correlation matrix for numerical features (body\_mass\_g, flipper\_length\_mm, bill\_length\_mm, bill\_depth\_mm) and visualize it using a **heatmap**.
   * Use sns.heatmap (axis-level) and show how to integrate it with a Matplotlib figure using plt.subplots.
7. **Pairwise Relationship Between Features**
   * Use sns.pairplot to visualize pairwise relationships between numerical features.
   * Add hue based on species and include histograms on the diagonal.
8. **Predicting Body Mass from Flipper Length**
   * Use a **regression plot** to study the linear relationship between flipper\_length\_mm and body\_mass\_g.
   * Use sns.regplot (axis-level) and sns.lmplot (figure-level).
   * Add a confidence interval and hue based on species.
9. **Impact of Bill Length and Depth on Body Mass**
   * Create a **residual plot** to analyze how well bill\_length\_mm predicts body\_mass\_g.
   * Use sns.residplot and explain how residuals help evaluate model quality.
10. **Body Mass Distribution Across Species**
    * Plot the distribution of body\_mass\_g for each species using **histograms** and **KDE plots**.
    * Use sns.histplot and sns.displot.
11. **Joint Distribution of Flipper Length and Bill Length**
    * Create a **joint plot** to show the relationship between flipper\_length\_mm and bill\_length\_mm.
    * Use sns.jointplot with different kinds (scatter, kde, hex) to analyze the data.