

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. 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.

7. 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.

8. 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.

9. Study the Relationship Between Body Mass and Island

- Even though **island** is categorical, examine the joint distribution of **body mass (body_mass_g)** and **island**.
- Use a joint plot with a categorical variable (**hue="island"**).
- Question: **How does body mass vary across different islands?** Are there outliers or species-specific trends?

10. Explore the Relationship Between Body Mass and Bill Depth

- Analyze the relationship between a penguin's **body mass (body_mass_g)** and its **bill depth (bill_depth_mm)**.
- Create both a **scatter joint plot** and a **KDE joint plot**.
- Question: Do heavier penguins tend to have deeper bills? What patterns can you observe across species?