

Homework 1

Harsh Mehta (Student Number: 24208383)

Penguins Dataset

The **penguins dataset** contains data on **344 adult penguins** across **three species** found on **three islands** in the Palmer Archipelago, Antarctica. The data includes information on their **physical characteristics** (bill length, bill depth, flipper length, and body mass), **sex**, and **year**.

This dataset is a cleaned subset of the more detailed penguins_raw dataset, which also includes nesting behavior and isotope data.

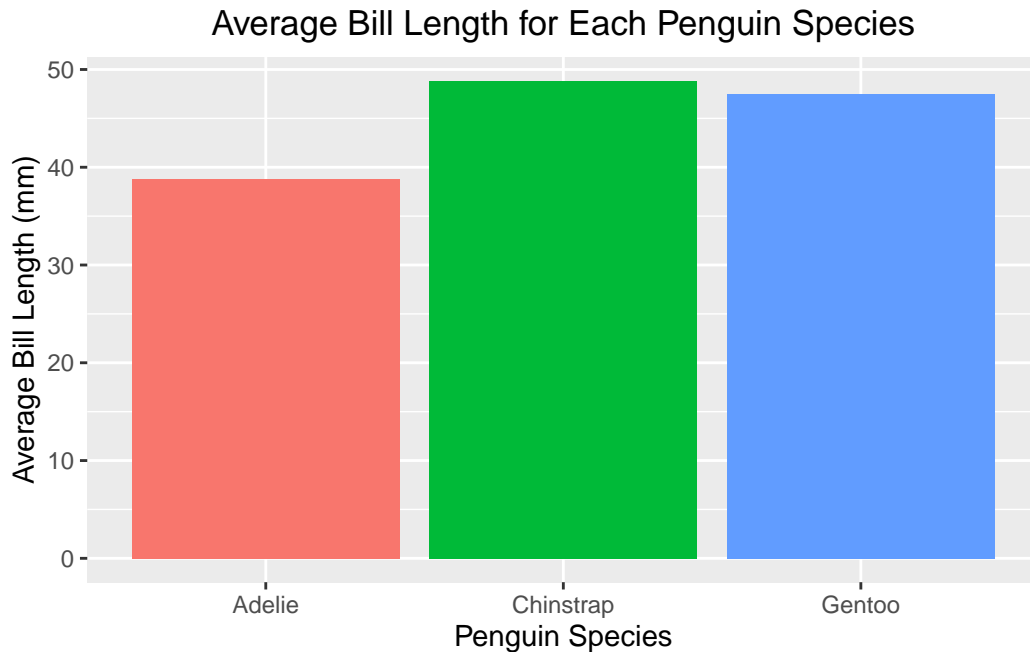
	species	island	bill_len	bill_dep	flipper_len	body_mass	sex	year
1	Adelie	Torgersen	39.1	18.7	181	3750	male	2007
2	Adelie	Torgersen	39.5	17.4	186	3800	female	2007
3	Adelie	Torgersen	40.3	18.0	195	3250	female	2007
4	Adelie	Torgersen	NA	NA	NA	NA	<NA>	2007
5	Adelie	Torgersen	36.7	19.3	193	3450	female	2007
6	Adelie	Torgersen	39.3	20.6	190	3650	male	2007

The dataset includes **8 variables**:

- *species (factor)*: Penguin species
- *island (factor)*: Island where the penguin was observed
- *bill_len (numeric)*: Bill length in millimeters
- *bill_depth (numeric)*: Bill depth in millimeters
- *flipper_len (integer)*: Flipper length in millimeters
- *body_mass (integer)*: Body mass in grams
- *sex (factor)*: Sex of the penguin
- *year (integer)*: Year the observation was recorded

Here, we loaded the **palmerpenguins** library since it has the dataset of penguin species from the Palmer Archipelago. Then we loaded the **dplyr** library for data manipulation and transformation. After that we loaded the **ggplot2** library for data visualization.

Now, we will create a barplot to visualize the average bill length for each penguin species.



The following can be interpreted from the above plot:

- **Chinstrap penguins** have the **longest average bill length**, measuring just under 50 mm.
- **Gentoo penguins** follow closely, with an average slightly lower than Chinstrap.
- **Adelie penguins** have the **shortest average bill length**, at around 39 mm.

This suggests that **bill length varies significantly between species**, potentially reflecting differences in **feeding habits, ecological adaptation, or evolutionary traits**.