Learning Goals

- Understand what a dataframe is and how to create dataframes from vectors using the `data.frame()` function.
- Interpret the structure of a dataframe using `str()` along with how to access elements of a dataframe using both bracket notation and the dollar sign syntax.
- Modify dataframes by renaming columns, removing rows or columns, and appending new data.
- Use logical indexing to filter dataframe rows that meet specific criteria.

Key Functions

For each of the following functions below write down a brief definition of what it does and a basic example

- **data.frame():**
- **head():**
- **str():**
- **cbind():**
- **rbind():**
- **nrow():**
- **dim():**
- **ncol():**
- **colnames():**

Key Concepts

1. Vectors are one dimensional objects and Data Frames are two dimensional objects. Because of that, when we do index-selection with data frames we must specify the:

2. What is the difference between df[3,] and df[,3]?

3. What does the dollar sign ($) represent when places immediately after the data frame variable?

Practice Problems

- Create a data frame called "people" that matches the following people with their age. Have one column called "name" and one column called "age":

$$\text{Alice} = 19,\ \text{Bob} = 20,\ \text{Charlie} = 18,\ \text{Dylan} = 20,\ \text{Emily} = 21$$

- How could you display all of the observations of people under of equal to the age of 20?

- Alter the column names to be "student" and "how_old_they_are"

- Use two different methods to display how old each student is in vector form by referencing the data frame