Learning Goals

- Generate numeric and character vectors using functions like `seq()`, `rep()`, and `sample()`.
- Use indexing techniques to select and exclude specific elements from a vector.
- Apply pattern matching with `grep()` and understand how regular expressions work within R.
- Use special functions like `which()`, `duplicated()`, `unique()`, `any()`, and `all()` to summarize or filter vector data.

Key Functions

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

- **seq():**
- **rep():**
- **grep():**
- **sample():**
- **set.seed():**
- **which():**
- **any():**
- **all():**
- **duplicated():**

Key Concepts

1. Why might it be useful to assign names to the elements of a vector instead of just using numeric indices?

2. How can we guarantee the same randomly generated values every time?

3. What is the output of a logical operator?

Practice Problems

- Create a sequence of numbers from 1 to 20 using 2 different methods

- Remove only the 2nd element from the vector using index-selection brackets
  `colors <- c("red","blue","green","yellow")`

- Create a logical vector that checks which values are between 10 and 15 for the following vector `values <- c(5, 12, 7, 14, 2)`

- Using functions in R, determine how many values are less than 5 in the following vector
  `values <- c(5,7,8,9,0,3,2,1,4,6,3,7,7,4,2)`

- Use `grep()` to find all words starting with the letter "c" in the vector
  `words <- c("cat","car","dog","cart","bat")`