
Homework for Lecture 4: R Vectors

The following homework assignment should be completed in the R console, and your code/outputs should then be copied to a text or Word document for submission. Please do not delete any errors that you make, as I would like to see your process in answering the questions. You may discuss the assignment with your classmates, but your write-up and work should be done independently of your classmates. The use of AI is considered a violation of academic policy for this assignment. When in doubt, ask me what is and is not allowed.

Answer the following questions. When you run code, make sure you explain what you are doing and what the output is telling us. This can be done with a comment *# Like this*.

1. Create a comment *# Exercise 1: Your Name*. Then answer the following questions:

- (a) Create a character variable containing your name and save it to the variable **name**.
- (b) Create a logical variable representing whether you own a pet or not and save it to the variable **pet**.
- (c) Create a double variable representing how many miles your hometown is from the Mount and save it to the variable **distance**.
- (d) Use the **typeof()** function to determine the element type of each variable. Is each type what you expected?
- (e) You can combine these into a single vector by typing:

```
combined_vector <- c(name, pet, distance)
```

Use **typeof()** to determine the type of **combined_vector**. What happened to the individual elements when they were combined into one vector?

2. Create a comment *# Exercise 2: Your Name*. Then answer the following questions:

- (a) Create a vector named **x** that contains the digits of your birthday, or just a random date in history. Place a comma between each number. For instance, the date 09/10/2025 would give us the vector:

```
x <- c(0, 9, 1, 0, 2, 0, 2, 5)
```

- (b) Calculate the mean of this vector.
- (c) Calculate the median of this vector.
- (d) Calculate the standard deviation of this vector.
- (e) Use logical vectors to determine how many digits are greater than or equal to 5. Do not count manually; use a function in R to count the **TRUE** values.
- (f) Display the digits that are greater than or equal to 5.
- (g) Multiply each element of **x** by 17.
- (h) Create a new vector called **y**, where each element is found by adding 12 to the corresponding element of **x** and then taking the square root. Then display this new vector.