

Assignment 2: Coding Basics

Yixin Fang

OVERVIEW

This exercise accompanies the lessons in Environmental Data Analytics on coding basics.

Directions

1. Rename this file `<FirstLast>_A02_CodingBasics.Rmd` (replacing `<FirstLast>` with your first and last name).
2. Change “Student Name” on line 3 (above) with your name.
3. Work through the steps, **creating code and output** that fulfill each instruction.
4. Be sure to **answer the questions** in this assignment document.
5. When you have completed the assignment, **Knit** the text and code into a single PDF file.
6. After Knitting, submit the completed exercise (PDF file) to Sakai.

Basics Day 1

1. Generate a sequence of numbers from one to 100, increasing by fours. Assign this sequence a name.
2. Compute the mean and median of this sequence.
3. Ask R to determine whether the mean is greater than the median.
4. Insert comments in your code to describe what you are doing.

```
#1.
sequence <- seq(1,100,4) #Create the sequence and name it
sequence #Show the result of the sequence
```

```
## [1] 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
```

```
#2.
mean_sequence <- mean(sequence) #Compute the mean of the sequence
median_sequence <- median(sequence) #Compute the median of the sequence
mean_sequence #Show the mean
```

```
## [1] 49
```

```
median_sequence #Show the median
```

```
## [1] 49
```

```
#3.
mean_sequence > median_sequence #See if the mean is larger than the median. The answer is FALSE

## [1] FALSE
```

Basics Day 2

5. Create a series of vectors, each with four components, consisting of (a) names of students, (b) test scores out of a total 100 points, and (c) whether or not they have passed the test (TRUE or FALSE) with a passing grade of 50.
6. Label each vector with a comment on what type of vector it is.
7. Combine each of the vectors into a data frame. Assign the data frame an informative name.
8. Label the columns of your data frame with informative titles.

```
#5.
names <- c('Hal', 'Moss', 'Sam', 'Shaw') #Character
scores <- c(98, 80, 76, 43) #Numeric
results <- c(TRUE, TRUE, TRUE, FALSE) #Logical

#7.
student_test_results <- data.frame(names,scores,results)

#8.
colnames(student_test_results) <- c('student_names', 'test_scores', 'test_results')
```

9. QUESTION: How is this data frame different from a matrix?

Answer: Data frame can have different types of data while the data in matrix are usually the same type.

10. Create a function with an if/else statement. Your function should take a **vector** of test scores and print (not return) whether a given test score is a passing grade of 50 or above (TRUE or FALSE). You will need to choose either the `if` and `else` statements or the `ifelse` statement.
11. Apply your function to the vector with test scores that you created in number 5.

```
passfail <- ifelse(scores < 50, FALSE, TRUE)
print(passfail)
```

```
## [1] TRUE TRUE TRUE FALSE
```

12. QUESTION: Which option of `if` and `else` vs. `ifelse` worked? Why?

Answer: 'ifelse' worked. Because the input is a vector, and 'ifelse' is the vectorization of the 'if...else' function.