

# Assignment 2: Coding Basics

Laurel Cohen

## OVERVIEW

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

## Directions

1. Change “Student Name” on line 3 (above) with your name.
2. Work through the steps, **creating code and output** that fulfill each instruction.
3. Be sure to **answer the questions** in this assignment document.
4. When you have completed the assignment, **Knit** the text and code into a single PDF file.
5. After Knitting, submit the completed exercise (PDF file) to the dropbox in Sakai. Add your first and last name into the file name (e.g., “FirstLast\_A02\_CodingBasics.Rmd”) prior to submission.

## Basics Day 1

1. Generate a sequence of numbers from one to 100, increasing by fours. Assign this sequence a name.

```
one_hundred_sequence <- seq(1, 100, 4)
```

2. Compute the mean and median of this sequence.

```
mean(one_hundred_sequence)
```

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

```
median(one_hundred_sequence)
```

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

3. Ask R to determine whether the mean is greater than the median.

```
mean(one_hundred_sequence) > median(one_hundred_sequence)
```

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

4. Insert comments in your code to describe what you are doing.

```
#1. The sequence is generated and its name is one_hundred_sequence.
```

```
#2. The mean and the median of one_hundred_sequence are both 49.
```

```
#3. False, the mean is not greater than the median.
```

## 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.

```
student_name <- c("first"="Ilana", "second"="David", "third"="Gabriel", "fourth"="Benjamin")
test_score <- c(98,93,82,41)
passing_status <- c(TRUE,TRUE,TRUE,FALSE)
```

6. Label each vector with a comment on what type of vector it is.

```
#student_name is a character vector.
#test_score is a numeric vector.
#passing_status is a logical vector.
```

7. Combine each of the vectors into a data frame. Assign the data frame an informative name.

```
student_test_results <- data.frame(student_name,test_score,passing_status)
```

8. Label the columns of your data frame with informative titles.

```
colnames(student_test_results)
```

```
## [1] "student_name" "test_score" "passing_status"
```

```
colnames(student_test_results) <- c("Student Name", "Test Score", "Passing Status")
```

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

Answer: The vectors are different modes instead of the same modes.

10. Create a function with an if/else statement. Your function should determine whether a 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. Hint: Use `print`, not `return`. The name of your function should be informative.

```
passing_test <- function(x) {
  ifelse(x>=50,yes="Pass",no="Fail")
}
```

11. Apply your function to the vector with test scores that you created in number 5.

```
test_outcome <- passing_test(test_score)
```

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

Answer: The 'ifelse' function worked because the function is not computing anything with the numbers; rather, it is simply checking to see whether or not the numbers themselves are greater than or equal to 50.