

# Assignment 2: Coding Basics

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## 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.*

*# Generate a sequence of numbers from one to 100, increasing by fours.*

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

```
## [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 and median of seq\_by\_four*

```
mean(seq_by_four)
```

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

```
median(seq_by_four)
```

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

```
#3.
```

```
# Determine whether the mean is greater than the median  
mean(seq_by_four) > median(seq_by_four)
```

```
## [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.

```
# Vector of names of student  
student <- c("Jessica", "Jasmine", "John", "Jackie")  
  
# Test scores out of a total 100 points  
test_scores <- c(98, 80, 95, 49)  
  
# Whether or not they have passed the test (TRUE or FALSE) with a passing grade of 50  
pass <- c("TRUE", "TRUE", "TRUE", "FALSE")  
  
# Combine vectors into data frame with informative titles (vectors given informative titles. no need to  
  
student_scores <- data.frame(student, test_scores, pass)  
student_scores
```

```
##   student test_scores pass  
## 1 Jessica          98  TRUE  
## 2 Jasmine          80  TRUE  
## 3   John          95  TRUE  
## 4  Jackie          49 FALSE
```

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

Answer: A matrix has a set of rows and columns of the same data type. A data frame is similar to a matrix, but you can have columns of different data types.

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.

```
# Function for whether a given test score is a passing grade of 50 or above (TRUE or FALSE)  
# Creation of function  
pass_fail <- function(x) {  
  ifelse(x>50, print("TRUE"), print("FALSE"))  
}  
  
# Test function on vector  
pass_fail(test_scores)
```

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

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

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

Answer: I used the ‘`ifelse`’ statement, but technically both options should work because they do the same thing.