

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.  
# I am generating a sequence of numbers from 1 to 100, increasing by fours  
sequence_number_one <- seq(1, 100, by = 4)  
#2.  
# I am computing the mean and median of my sequence of numbers  
mean(sequence_number_one)
```

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

```
median(sequence_number_one)
```

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

```
#3.  
# I am asking R to determine whether the mean is greater than the median  
mean(sequence_number_one) > median(sequence_number_one)
```

```
## [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.

```
#Student 1 name and grade
sam <- 37
#Did Student 1 pass?
sam > 50
```

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

```
#Student 2 name and grade
john <- 54
#Did Student 2 pass?
john > 50
```

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

```
#Student 3 name and grade
sarah <- 75
#Did Student 3 pass?
sarah > 50
```

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

```
#Student 4 name and grade
lisa <- 44
#Did Student 4 pass?
lisa > 50
```

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

```
Student_names_and_grades <- data.frame(sam, john, sarah, lisa)
```

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

Answer: A matrix can only contain a single class of data. A data frame can contain multiple classes of data.

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

Answer: 'if' and 'else' is the proper option to use here because it determines the outcome based on two different options, whether the test score is 50 or above, or below.