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.

Sq_onehundred <- seq (1,100,4) #Calculate the mean of the sequence
Sq_onehundred

## [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 (Sq_onehundred) #Calculate the mean of the sequence

## [1] 49

median (Sq_onehundred) #Calculate the median of the sequence
```

[1] 49

```
#3.
mean (Sq_onehundred) > median (Sq_onehundred) #if the mean is greater than median
```

[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.

```
Students_name<- c('Amy','Cici','Roy','Cindy')
Score <- c(80,30,20,90)
Pass_Fail <- c('Pass','Fail','Fail','Pass')
df_Exam <- data.frame(Students_name,Score, Pass_Fail)
colnames(df_Exam) <- c('Name','Score','Grade')</pre>
```

- 9. QUESTION: How is this data frame different from a matrix? > Answer: The main difference is that matrices can only contain a single class of data, while data frames can consist of many different classes of data. A data frame is the term in R for a spreadsheet style of data: a grid of rows and columns. Matrices behave as two-dimensional vectors.
- 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.

```
Grade <- function(x) {
  ifelse(x < 50, 'Pass', 'Fail')
}
Grade(Score)</pre>
```

```
## [1] "Fail" "Pass" "Pass" "Fail"
```

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

Answer: if else function will work because it checks each element in a vector one at a time, while if and else one only check the first element in this vector.