Assignment 2: Coding Basics

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OVERVIEW

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

Directions

1. Rename this file `<Peter Wasswa>_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 Canvas.

Basics, Part 1

1. Generate a sequence of numbers from one to 55, increasing by fives. 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.

```r
#1.
##This line of code generates a sequence of numbers from 1-55 by 5  increment
seq1 <- seq(1, 55, 5)
seq1
```

```
##  [1]  1  6 11 16 21 26 31 36 41 46 51
```

```r
##seq<-seq(1,55,by=5) #another approach
#2.
#2. Mean and median of seq1
mean_seq1<-mean(seq1) # The mean is 26
median_seq1<-median(seq1) # The median is 26

#3.
##This line of code checks whether the mean is greater than the medium
mean_seq1 > median_seq1 # returns false since mean and medium are equal!
```

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

Basics, Part 2

5. Create three vectors, each with four components, consisting of (a) student names, (b) test scores, and (c) whether they are on scholarship or not (TRUE or FALSE).

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.

```r
Student = c("Joy","Tom","Jane","May")# vector to store students' names
test_scores = c(49.5,95.9,55.4,89) #vector to store students' scores
Scholarship = c(TRUE, TRUE, FALSE,FALSE)#vector to store students' scholarship status

df_student <- cbind(Student,test_scores,Scholarship) # dataframe to combine students' attributes
#df_student
```

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

   Answer:A dataframe can handle more than one data structure while a matrix handles only one data structure

10. Create a function with one input. In this function, use `if...else` to evaluate the value of the input: if it is greater than 50, print the word "Pass"; otherwise print the word "Fail".

11. Create a second function that does the exact same thing as the previous one but uses `ifelse()` instead if `if...else`.

12. Run both functions using the value 52.5 as the input

13. Run both functions using the **vector** of student test scores you created as the input. (Only one will work properly...)

```r
#10. Create a function using if...else
func1 <- function(x) {
  if(x > 50) {
    print("Pass")
  }
  else {
    print("Fail")
  }
}

#11. Create a function using ifelse()
func2 <- function(x) {
  ifelse(x > 50, "Pass", "Fail")}

#12a. Run the first function with the value 52.5
func1(52.5)
```

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

```
#12b. Run the second function with the value 52.5
func2(52.5)
```

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

```
#13a. Run the first function with the vector of test scores
# func1(test_scores)
# Error in if (x > 50) { : the condition has length > 1

#13b. Run the second function with the vector of test scores
func2(test_scores)
```

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

14. QUESTION: Which option of if...else vs. ifelse worked? Why? (Hint: search the web for "R vectorization")

Answer:if .... else didnot work because it can only handle dataframe with condition length not greater 0ne. ifelse worked because it can handle dataframe with condition length more than one

NOTE Before knitting, you'll need to comment out the call to the function in Q13 that does not work. (A document can't knit if the code it contains causes an error!)