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 `<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 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.

```
#1. creating a sequence from 1 to 55 by 5s and assigning it to a variable and printing the variable to
seq<-seq(from=1, to=55, by=5)
seq
```

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

```
#2. we used the mean and median funcitons and input our variable to find mean and median
mean(seq)
```

```
## [1] 26
```

```
median(seq)
```

```
## [1] 26
```

```r
#3. this gave us a true or false statement to see if our mean was greater then median.
#It was false meaning mean is not greater than median.
mean(seq)>median(seq)
```

```
## [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
#Character
names <- c("Aidan", "John", "Emma", "Bob")
#Numeric
scores<- c(1, 100, 98, 75)
#Logical Vector
scholarship<- c(FALSE, TRUE, TRUE, FALSE)

Academics_Students <- data.frame(Name = names, Scores = scores, Scholarship = scholarship)
Academics_Students
```

```
##    Name Scores Scholarship
## 1 Aidan      1       FALSE
## 2  John    100        TRUE
## 3  Emma     98        TRUE
## 4   Bob     75       FALSE
```

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

   Answer: Collumns have to be the same data, example: logical, type in a matrix.

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

if.else1 <- function(input){
if (input > 50) {
```

```
print("Pass")
} else {
print("Fail")
}}

#11. Create a function using ifelse()
if.else2 <- function(input){
ifelse(input>50, "Pass", "Fail")}
#12a. Run the first function with the value 52.5
if.else1(52.5)
```

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

```
#12b. Run the second function with the value 52.5
if.else2(52.5)
```

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

```
#13a. Run the first function with the vector of test scores
#if.else1(scores)
#13b. Run the second function with the vector of test scores
if.else2(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: The second code ran, ifelse function. The first function needs to have a for loop to go through each element in the vector. Without the for loop it doesnt understand which element to compair the value with.

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!)