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'm using seq(1, 100, 4) since the format is seq(starting number, ending number, interval number),
#and assigning this function to seq100.
seq100 <- seq(1, 100, 4)

#2. I used the mean and median function on the object seq100 I made up above and assigned them both to
#a mean_seq100 and median_seq100 respectively so I could call them later on.
mean_seq100 <- mean(seq100)
median_seq100 <- median(seq100)

mean_seq100
```

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

```
median_seq100
```

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

```
#3. I typed this command to see if the output if R was true or false, and the output was false.
#This means the mean is not greater than the median.
mean_seq100 > median_seq100
```

```
## [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.

```
#5.
names_of_students <- c("Karina","Nadia","Abby","Emma")
test_scores <- c(43, 59, 89, 98)
passed_test <- c(FALSE, TRUE, TRUE, TRUE)

#6.
class(names_of_students) #This is a character vector
```

```
## [1] "character"
```

```
class(test_scores) #This is a numeric vector
```

```
## [1] "numeric"
```

```
class(passed_test) #This is a logical vector
```

```
## [1] "logical"
```

```
#7 and 8.
student_test_scores.df <- data.frame("Student Name"=names_of_students, "Test Scores"=test_scores, "Pass
student_test_scores.df
```

```
##   Student.Name Test.Scores  Pass
## 1       Karina          43 FALSE
## 2        Nadia          59  TRUE
## 3         Abby          89  TRUE
## 4         Emma          98  TRUE
```

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

   Answer: In a matrix, all of the values have to be the same "mode" or type of vector (e.g. have to all be characters or numeric or logical), but in a data frame you can have multiple columns which can be different vector 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.

```
#10.
did_student_passv.2 <- function(x) {P <- ifelse(x>=50,TRUE,FALSE)
                                    print(P)}

#11.
did_student_passv.2(test_scores)
```

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

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

    Answer: 'if' and 'else' statements only run the first value in the vector. When I ran the code with 'if' and 'else' (not featured), it had an error because I had more than one value of numbers I wanted it to check. So, 'ifelse' works because I'm asking R to tell me if multiple test scores are over 50 and pass.