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')
```

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)
```

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

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

    Answer: ifelse 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.