Assignment 2: Coding Basics

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OVERVIEW

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

Directions

1. Change "Student Name" on line 3 (above) with your name.
2. Work through the steps, **creating code and output** that fulfill each instruction.
3. Be sure to **answer the questions** in this assignment document.
4. When you have completed the assignment, **Knit** the text and code into a single PDF file.
5. After Knitting, submit the completed exercise (PDF file) to the dropbox in Sakai. Add your first and last name into the file name (e.g., "FirstLast_A02_CodingBasics.Rmd") prior to submission.

```
knitr::opts_chunk$set(echo = TRUE)
knitr::opts_chunk$set(error = TRUE)
```

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.
MySequence<-seq(1,100,4) #generate a sequence
#2.
mean(MySequence) # calculate the mean
```

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

```
median(MySequence) # calculate the median
```

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

```
#3.
mean(MySequence)>median(MySequence) # Ask R to determine whether the mean is greater than the 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.

```
#5.
a<-c("John","Mary","Bob","Amy","Carl") #type: character
b<-c(100,90,80,70,40) #type: numeric
c<-c(TRUE,TRUE,TRUE,TRUE,FALSE) #type: logical

#7.
StudentScore<-cbind(a,b,c)

#8.
colnames(StudentScore) <-c('StudentNames','TestScore','WhetherPass')
```

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

   Answer: this data frame contains multiple classes of data, such as StudentNames,TestScore,WhetherPass; whereas matrix can only have one class of data.

10. Create a function with an if/else statement. Your function should determine whether a 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. Hint: Use `print`, not `return`. The name of your function should be informative.
11. Apply your function to the vector with test scores that you created in number 5.

```
#10.1
Whether_pass<-function(x){ifelse(x>=50, print(TRUE), print(FALSE)) }

#11.
Test_score<-Whether_pass(StudentScore[, "TestScore"])
```

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

```
Test_score
```

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

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

    Answer: 'ifelse' worked since 'if' and 'else' can only react to one logical element (i.e., a TRUE or a FALSE) at a time.