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, Part 1

1. Generate a sequence of numbers from one to 30, increasing by threes. 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 am asking R to generate a sequence from 1 to 30 that increases by 3s and then naming it "my_seq".
seq(1,30,3)
```

```
##  [1]  1  4  7 10 13 16 19 22 25 28
```

```
my_seq <-seq(1,30,3)

#2. I am computing the mean of the sequence and naming it "mean" as well as computing
##the median and naming it "med."
mean(my_seq)
```

```
## [1] 14.5
```

```
mean <-mean(my_seq)
median(my_seq)
```

```
## [1] 14.5
```

```
med <-median(my_seq)

#3. I am computing if the mean is greater than the median, and if it is, it should say "true".
##If it is not, it should say "false." As the two values are equal, the expected result is false.
val=ifelse(mean>med,TRUE,FALSE)
print(val)
```

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

Basics, Part 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.

```
Name<-c("Abby","Betty","Carrie","Delia") #Character vector
Score<-c(40,50,60,70) #Numeric vector
Pass<-c(FALSE,TRUE,TRUE,TRUE) #Logical vector
Test_Scores<-cbind.data.frame(Name,Score,Pass)
print(Test_Scores)
```

```
##     Name Score  Pass
## 1   Abby    40 FALSE
## 2  Betty    50  TRUE
## 3 Carrie    60  TRUE
## 4  Delia    70  TRUE
```

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

   Answer:This data frame has three different types of data (character, numeric, and logical) whereas a matrix only has a single type of data.

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.

```
val2=ifelse(Score>=50,TRUE,FALSE)
print(val2)
```

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

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

    Answer: 'ifelse' produces the correct results since it is able to read all values of the vector. 'if' and 'else' are only able to read the first value of the vector and so an error message is produced.