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.

```r
#1.
seq1 <- seq(1,30,3)   # a sequence of numbers from 1 to 30 increasing by threes.
seq1
```

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

```r
#2.
mean(seq1) # mean of this seq
```

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

```r
median(seq1) # median of this seq
```

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

```
#3.
mean(seq1) > median(seq1) # whether mean is greater than the median, if yes return TRUE
```

```
## [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.

```
studentname <- c('Amy', 'Jane', 'Jim', 'Sam') # the names of students
testscore <- c(78,96,48,60) # the scores of these students
pass <- c(TRUE,TRUE,FALSE,TRUE) # whether they passed the test or not

Stu_TestScore <- data.frame("Student_Names" = studentname, "Scores" = testscore, "Pass_or_not" = pass)
Stu_TestScore
```

```
##   Student_Names Scores Pass_or_not
## 1           Amy     78        TRUE
## 2          Jane     96        TRUE
## 3           Jim     48       FALSE
## 4           Sam     60        TRUE
```

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

   Answer: Matrix only have one type of data but this data frame have 3 types of data (numeric, logical, character).

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.

```
Passing1 <- function(v_score){ # v_score is a vector of scores
  for (grade in v_score) { # grade is a variable of grade in v_score
    ifelse(grade >= 50, print(TRUE),print(FALSE))
  }
}
Passing1(testscore)
```

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

```r
Passing2 <- function(v_score){ # v_score is a vector of scores
  for (grade in v_score) { # grade is a variable of grade in v_score
    if(grade >= 50){
      print(TRUE)
    }else{
      print(FALSE)
    }
  }
}
Passing2(testscore)
```

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

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

    Answer: Both 'if''else' and 'ifelse' worked in the end. I provided the two solution of the two different methods above.