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.

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

# Calculate mean and median of the sequence
mean(my.sequence)
```

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

```
median(my.sequence)
```

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

```
# Check if the mean is greater than the median
mean(my.sequence) > median(my.sequence)
```

```
## [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.

```r
# Create a series of vectors
names <- c('Hanna', "Haru", "Jolina", "John", "Juan")
test.scores <- c(100, 90, 45, 85, 40)
pass <- c(TRUE, TRUE, FALSE, TRUE, FALSE)

# Check vector type
class(names) #character vector
```

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

```r
class(test.scores) #numeric vector
```

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

```r
class(pass) #logical vector
```

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

```r
# Combine vectors into a dataframe and assign names to columns
student.test.info <- data.frame(Name=names, Score=test.scores, Pass=pass)
```

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

   Answer: The main difference between a matrix and a dataframe is that a dataframe can stroce different types of vector (e.g. logical, numeric, character), whereas a matrix stores only one 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.

```r
my.function <- function(x){
  ifelse(x<50, FALSE, TRUE)
}

check.for.pass <- my.function(test.scores)
```

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

   Answer: "ifelse" worked because this statement can handle vectors. In contrast, the "if" and "else" statement can only be applied to a single value, so it would not work in our case because we have a list of test scores we want to test for the True/False condition.