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.

```
seq1_30_3 <- seq(1,30,3)
```

2. Compute the mean and median of this sequence.

```
mean(seq1_30_3)
```

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

```
median(seq1_30_3)
```

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

```
mean_seq1 <- mean(seq1_30_3)
median_seq1<- median(seq1_30_3)
```

3. Ask R to determine whether the mean is greater than the median.

```
mean_seq1 > median_seq1
```

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

4. Insert comments in your code to describe what you are doing.

```
#1. Generate a sequence and give it a name

#2. Let R find the mean and median of sequence 1 and give them a name, correspondingly

#3. This argument will return TRUE if the mean is greater than the median, but in this case, the argume
```

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.

```r
# Student names
student_names <- c("Amy", "Bob", "Cat", "Dog")

# Test scores out of 100
test_scores <- c(75, 90, 48, 60)

# Passed or not
pass_status <- test_scores >= 50

# Data Frame
student_data <- data.frame(Student_Name = student_names, Test_Score = test_scores, Pass_Status = pass_s

# Return the frame
print(student_data)
```

```
##   Student_Name Test_Score Pass_Status
## 1          Amy         75        TRUE
## 2          Bob         90        TRUE
## 3          Cat         48       FALSE
## 4          Dog         60        TRUE
```

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. #Function under 5 will do

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

   Answer: The matrix must contain the same data type (all numbers or all text, etc). Matrix also don't need a column/row name, a "matrix name" might be okay.

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.

```r
ifelse(test_scores >= 50, "Pass", "Did not pass")
```

```
## [1] "Pass"         "Pass"         "Did not pass" "Pass"
```

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11. Apply your function to the vector with test scores that you created in number 5. #Function under 10 will do

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

Answer:In this case, only ifelse will work because we want to compare a vector with a scalar. If/else can only work with scalar.