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.
basics <- seq(1,30,3) #creating a sequence from 1 to 30 by threes

#2.
mean(basics) #finding the mean of the sequence
```

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

```
median(basics) #finding the median of the sequence
```

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

```
#3.
mean(basics) > median(basics) #testing if the mean is greater than the median, which is false
```

```
## [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
student_names <- c("Emily", "Elizabeth", "Hannah", "Kallie") #student names, character vector
score <- c(35, 80, 99, 75) #test scores, double/numeric vector
pass <- c(FALSE, TRUE, TRUE, TRUE) #pass or fail, logical vector

student_tests <- data.frame(cbind(student_names, score, pass))

colnames(student_tests) <- c("Student Name", "Test Score out of 100", "Pass with a score of 50?")
```

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

   Answer: This dataframe is different than a matrix because it contains multiple classes of data. A matrix can only contain one class 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
p_or_f <- function(x) {
  if(x < 50) {
    print(FALSE)
  }
  else {
    print(TRUE)
  }
}

pass_fail <- function(x) {
  print(ifelse(x<50, FALSE, TRUE))
}

pass_fail(score)
```

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

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

    Answer: The `ifelse` option worked because it could be applied to each value of the vector of test scores, whereas the if and else option could only apply the function to a single object and not a vector.