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 Day 1

1. Generate a sequence of numbers from one to 100, increasing by fours. 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.
result_1 = seq(1,100,4)

#2.
# mean of this sequence
mean(result_1)
```

```
## [1] 49
```

```
# median of this sequence
median(result_1)
```

```
## [1] 49
```

```
#3.
# Ask R to determine whether the mean is greater than the median.
mean(result_1) > median(result_1)
```

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

```
# So the median is not greater than the median
```

Basics Day 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.

```
# Create vectors for student names
student_names <- c("Alex", "Brian", "Charlie", "Douglas")
# test scores
test_scores <- c(80, 45, 100, 60)
# pass/fail status
pass_fail <- test_scores >= 50

# Combine the vectors into a single data frame
students_df <- data.frame(names = student_names,
                          score = test_scores,
                          pass = pass_fail)
```

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

   Answer: A matrix is a two-dimensional array in R that can only hold elements of the same type of variables, whereas a data frame is a table-like structure that can hold different types of variables.

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.

```
check_scores <- function(scores){
  pass_fail <- ifelse(scores >= 50, "TRUE", "FALSE")
  print(pass_fail)
}
```

11. Apply your function to the vector with test scores that you created in number 5.

```
check_scores(test_scores)
```

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

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

    Answer: I used the ifelse to do so. With ifelse statement, I directly map the passing grade test scores, in one line of code.