Assignment 2: Coding Basics

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OVERVIEW

This exercise accompanies the lessons in Environmental Data Analytics on coding basics.

Directions

1. Change "Student Name" on line 3 (above) with your name.
2. Work through the steps, **creating code and output** that fulfill each instruction.
3. Be sure to **answer the questions** in this assignment document.
4. When you have completed the assignment, **Knit** the text and code into a single PDF file.
5. After Knitting, submit the completed exercise (PDF file) to the dropbox in Sakai. Add your first and last name into the file name (e.g., "FirstLast_A02_CodingBasics.Rmd") prior to submission.

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.
seq_100 <- seq(1,100,4) #defining object that generates sequence of numbers, 1 to 100, increasing by 4'
seq_100 #calling sequence object
```

```
##  [1]  1  5  9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
```

```
#2.
mean.seq_100 <- mean(seq_100) #defining object that is mean of number sequence
median.seq_100 <- median(seq_100) #defining object that is median of number sequence
mean.seq_100 #calling mean object
```

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

```
median.seq_100 #calling median object
```

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

```
#3.
mean.seq_100 > median.seq_100 #determining whether the mean is greater than median
```

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

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.

```
student_name <- c("River","Blossom","Willow","Juniper") #created vector of student names, character
student_name
```

```
## [1] "River"   "Blossom" "Willow"  "Juniper"
```

```
test_scores <- c(89, 54, 72, 49) #created vector of test scores, numeric
test_scores
```

```
## [1] 89 54 72 49
```

```
test_pass <- c("True", "True", "True", "False") #created vector of passing grade >50, character
test_pass
```

```
## [1] "True"  "True"  "True"  "False"
```

```
student_test_results_df <- cbind(student_name, test_scores, test_pass) #created df by combining vectors
student_test_results_df
```

```
##      student_name test_scores test_pass
## [1,] "River"      "89"        "True"
## [2,] "Blossom"    "54"        "True"
## [3,] "Willow"     "72"        "True"
## [4,] "Juniper"    "49"        "False"
```

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

   Answer: Data frames consist of columns with different attribute types. In a matrix, all columns consist of data that are the same atrribute type.

10. Create a function with an if/else statement. Your function should determine whether a 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. Hint: Use `print`, not `return`. The name of your function should be informative.

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

```
pass_fail <- function(x){ #created function for passing/failing
  ifelse(x>=50, "True", "False")
}

pass_fail(test_scores) #vector with pass/fail function
```

```
## [1] "True"  "True"  "True"  "False"
```

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

    Answer: The option of "ifelse" worked when computing the fuction. This allowed the function to be able to run through the vector. However, when using the "if" and "else" statement, it was not able to run the function through the vector as it would stop at the first element. Therefore, it wasn't able to apply the function to all four components of the vector.