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 last name into the file name (e.g., "Salk_A02_CodingBasics.Rmd") prior to submission.

The completed exercise is due on Tuesday, January 21 at 1:00 pm.

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.
sequence_4 = seq (1, 100, 4) # list and names the sequence

#2.
mean (sequence_4) # gives the mean of the sequence
```

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

```
median (sequence_4) # gives the median of the sequence
```

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

```
#3.
mean (sequence_4) > median (sequence_4) # tells you if the mean is greater than the median; in this cas
```

```
## [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.

```
#5&6
a <- c("Nicholas","Charlotte","Hirak", "Lusine") # character vector with the names of the students
b <- c(82, 70, 48, 95) # numeric vector the test scores out of a total 100 points
c <- c(TRUE, TRUE, FALSE, TRUE) # logical vector to determine whether the student has passed the test w

#7
StudentTestResults <- data.frame(a,b,c) # Combined vectors into data frame called StudentsTestResults
#8
names(StudentTestResults) <- c("Name","Score","Passed"); View(StudentTestResults) # labelled the column
```

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

   Answer: In a data frame the columns contain different types of data, but in a matrix all the elements are the same type of data. A matrix in R usually mathematical matrix containing all numbers.

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.

```
#10
ScoreF1 <- function (x) # creating a function for 'if' and 'else' option
if (x > 50) {
  print ("True")
} else {
print ("False")
}  # statement for 'if' and 'else' option


ScoreF2 <- function  (x) # creating a function for 'ifelse' option
ifelse(x > 50, print ("TRUE"), print ("FALSE")) # statement for 'ifelse' option



#11
ScoreF1(b) # applying the 'if' and 'else' statement for test scores create in number 5
```

```
## Warning in if (x > 50) {: the condition has length > 1 and only the first
## element will be used
```

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

```
ScoreF2(b) # applying the 'ifelse' statement for test scores create in number 5
```

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

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

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

   Answer: The 'if' and 'else option did not worked, while the 'ifelse' option worked! This is because the 'if' and 'else' option works if the vector only has one component (quantity), however ifelse statement works when the vector has multiple components.