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.
question1 <- seq(1,100,4) #created a sequence from numbers 1 to 100 increasing by fours

#2.
meanseq <- mean(question1) #mean of sequence
medseq <- median(question1) #median of sequence

#3.
meanseq > medseq #stating the mean is greater than the median, answer: false
```

```
## [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.

```
names <- c("Claire", "Masha", "Nikki", "Kathleen") #character vector
scores <- c(95, 90, 85, 97) #numeric vector
passed <- c(TRUE, TRUE, TRUE, TRUE) #logical vector

student_tests <- data.frame(names,scores,passed) #created a dataframe with all vectors
names(student_tests) <- c("Name","Score","Passed") #named columns of dataframe
```

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

   Answer: A dataframe is a collection of different types of data (numeric, logical, character) with column names and row names. A matrix contains all of the same type of data.

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.

```
test_scores <- function(x) {
  ifelse(x<50,"FALSE", "TRUE")
  }
```

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

```
test_scores(scores)
```

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

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

   Answer: The 'ifelse' correctly worked instead of the 'if' and 'else'. When I used the 'if' and 'else' inside the function, I got an error answer that only the first element will be used. The 'ifelse' works with logical vectors with lengths greater than one.

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