Assignment 2: Coding Basics

Katie Krejsa

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.

```r
#1. Creating a sequence of numbers from 1 to 100, increasing by 4. Assigned this sequence the
#   name seq100.
seq100 <- seq(1,100,4)

#2. Finding the mean and median of my above sequence.
mean(seq100)
```

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

```r
median(seq100)
```

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

```r
#3. Asking R if the mean of the sequence is greater than the median of the sequence.
mean(seq100) > median(seq100)
```

```
## [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.

```r
# this is a character vector
student_names <- c("Jade", "Evan", "Gloria", "Kevin")

# this is a numeric vector
test_scores <- c(96, 49, 68, 90)

# this is a logical vector
passing_grade <- c(TRUE, FALSE, TRUE, TRUE)

# combining the three vectors into a data frame.
test_score_dat <- cbind(student_names, test_scores, passing_grade)
```

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

   Answer: A data fram is different tha a matrix in that a data frame can have columns of different types of data (i.e. character, numeric, integer, logical, complex). All columns and rows in a matrix are 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.

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

```r
# creating a function to determine whether each score
passing_grade_function <- ifelse(test_scores > 49, print("TRUE"), print("FALSE"))
```

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

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

    Answer: The 'ifelse' option worked because my function is a conditional statement - a score either passed or did not pass (i.e. TRUE or FALSE). However, if there were more than two outcomes that you wanted to differentiate, you would have to use the 'if' and 'else' option.