Assignment 2: Coding Basics

Camila Zarate Ospina

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.

```
# from, to, by
sequence <- seq(1, 100, 4)
sequence
```

```
##  [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. Compute the mean and median of this sequence.

```
meanseq <- mean(sequence)
medianseq <- median(sequence)

meanseq
```

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

```
medianseq
```

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

3. Ask R to determine whether the mean is greater than the median.

```
meanseq > medianseq
```

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

4. Insert comments in your code to describe what you are doing.

```
#1. Used the command seq to generate the sequence requested, following the "from, to, by" form.

#2. Used the funcion mean and median to obtain the mean and the median of the sequence, and assigned th

#3. Used the command > and the objects created in the previous step to determine if one was greater tha
```

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.

```
names <- c("Amrita", "Natalia", "Megan", "Camila")
testscores <- c(40, 70, 80, 90)
pass <- c(FALSE, TRUE, TRUE, TRUE)
```

6. Label each vector with a comment on what type of vector it is.

```
class(names)
```

```
## [1] "character"
```

```
class(testscores)
```

```
## [1] "numeric"
```

```
class(pass)
```

```
## [1] "logical"
```

```
names # character
```

```
## [1] "Amrita"  "Natalia" "Megan"   "Camila"
```

```
testscores #numeric
```

```
## [1] 40 70 80 90
```

```
pass # logical
```

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

7. Combine each of the vectors into a data frame. Assign the data frame an informative name.

```
examresults.df<-data.frame(names, testscores, pass)
```

8. Label the columns of your data frame with informative titles.

```
names(examresults.df) <- c("Student name", "Test score", "Pass?")
View(examresults.df)
```

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

   Answer: A matrix contains elements of the same type, and a data frame can contain elements of different types, in our case, characters, numeric and logical.

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.

```
# name <- function(object)   {ifelse(condition, result if true, result if false)}
score <- function(testscores){ifelse(testscores>49, "TRUE", "FALSE")}
score(testscores)
```

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

```
# name <- function(x)          {if(condition) {result} else {other result} }
# score1 <- function(testscores){if(testscores > 49) {"TRUE"} else {"FALSE"}}
# score1(testscores)
```

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

    Answer: The operation "ifelse" works and the condition is asked to the 4 elements (4 test scores). When using "if else" separated, there's an error showing that "the condition has length > 1 and only the first element will be used", meaning that the condition is only being asked to the first element in test scores (the first test score) and not the 4 test scores I am evaluating.