Assignment 2: Coding Basics

Kathlyn MacDonald

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.
#Creating a sequence of #s from 1 to 100, going up by 4s; and assigning to the name sequence_by4:
sequence_by4 <- seq(1,100,4)
#calling the sequence to the console:
sequence_by4
```

```
##  [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.
#Calculate the average of sequence_by4
mean(sequence_by4)
```

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

```
#Find the middle value in sequence_by4
median(sequence_by4)
```

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

```r
#3.
#Asking if the mean is greater than the median:
mean(sequence_by4)>median(sequence_by4)
```

```
## [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
#Vector character list with all names of the students
studentNames<- c('John','Emily',"Mary","Jodie","Sunny","Jackie","Atalie","Jimmy","Jiblet","Karen","Samar

#Numerical list with all the grades the students received

grades<-c(75,56,90,48,67,89,35,56,64,73,45,97,84,35,25,55,86,75,90,90,43,76,41,84,79)

#If else statement assigning fail if the grade is less then 50, and pass if the grade is above 50
TrueOrFalse<- ifelse(grades<50,"False","True")

TrueOrFalse
```

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

```r
#Creating the data frame
df_names <- as.data.frame(studentNames)
#Binding the grades and pass/fail status to the data frame
df_StudentList <-cbind(df_names,grades,TrueOrFalse)

class(df_StudentList)
```

```
## [1] "data.frame"
```

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

   Answer: A matrix must have elements of all the same type, this data frame contains both numerical values and characters.

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.

```
#Generating pass or fail status, depending on if the grade is above 50
PassFailStatus<-
  ifelse(TrueOrFalse=="True",print("Pass"),print("Fail"))
```

```
## [1] "Pass"
## [1] "Fail"
```

```
PassFailStatus
```

```
##  [1] "Pass" "Pass" "Pass" "Fail" "Pass" "Pass" "Fail" "Pass" "Pass" "Pass"
## [11] "Fail" "Pass" "Pass" "Fail" "Fail" "Pass" "Pass" "Pass" "Pass" "Pass"
## [21] "Fail" "Pass" "Fail" "Pass" "Pass"
```

```
#
df_StudentList <-cbind(df_names,grades,TrueOrFalse,PassFailStatus)
df_StudentList
```

```
##    studentNames grades TrueOrFalse PassFailStatus
## 1          John     75        True           Pass
## 2         Emily     56        True           Pass
## 3          Mary     90        True           Pass
## 4         Jodie     48       False           Fail
## 5         Sunny     67        True           Pass
## 6        Jackie     89        True           Pass
## 7        Atalie     35       False           Fail
## 8         Jimmy     56        True           Pass
## 9        Jiblet     64        True           Pass
## 10        Karen     73        True           Pass
## 11     Samantha     45       False           Fail
## 12      Jessica     97        True           Pass
## 13       Angela     84        True           Pass
## 14       Dwight     35       False           Fail
## 15          Syd     25       False           Fail
## 16  Mrs.Poppins     55        True           Pass
## 17        Janet     86        True           Pass
## 18          Ted     75        True           Pass
## 19     Mr.Mosby     90        True           Pass
## 20      Vincent     90        True           Pass
## 21       Arthur     43       False           Fail
## 22        Candy     76        True           Pass
## 23      Junebug     41       False           Fail
## 24         Emmy     84        True           Pass
## 25        Roger     79        True           Pass
```

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

    Answer: I only got the ifelse statement to work. I got an error message with the if else statement, that the condition was too long, and it wouldn't check all of the elements. I would assume that means that the if else function doesn't work with a vector, and only works wth one element.