Assignment 2: Coding Basics

Desa Bolger

OVERVIEW

This exercise accompanies the lessons in Environmental Data Analytics on coding basics.

Directions

1. Rename this file `DesaBolger_A02_CodingBasics.Rmd` (replacing `<FirstLast>` with your first and last name).
2. Change "Student Name" on line 3 (above) with your name.
3. Work through the steps, **creating code and output** that fulfill each instruction.
4. Be sure to **answer the questions** in this assignment document.
5. When you have completed the assignment, **Knit** the text and code into a single PDF file.
6. After Knitting, submit the completed exercise (PDF file) to Sakai.

Basics, Part 1

1. Generate a sequence of numbers from one to 30, increasing by threes. 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. I am creating a sequence from 1 to 30, skipping by 3s
seqThree <- seq(1, 30, 3)
seqThree
```

```
##  [1]  1  4  7 10 13 16 19 22 25 28
```

```r
#2. I am taking the mean and median of seqThree
mean(seqThree)
```

```
## [1] 14.5
```

```r
median(seqThree)
```

```
## [1] 14.5
```

```
#3.
{
  if(mean(seqThree) > median(seqThree)) #Comparing Mean and Median
    {
     print("Mean is bigger") #Printing the larger value
    }
  else if (mean(seqThree) < median(seqThree)) #Comparing Mean and Median
    {
     print("Median is bigger") #Printing the larger value
    }
  else
    {
     print("Mean is equal to median") #Only option left is that they are equal
    }
}
```

```
## [1] "Mean is equal to median"
```

Basics, Part 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 and 6.
names <- c("Desa", "Ayoung", "Nusrat", "Emma") #Character
scores <- c(20, 60, 80, 100) #Integer
passed <- c(FALSE, TRUE, TRUE, TRUE) #Logical

#7.

ScoresDf <- cbind(names,scores,passed)
df_Scores <- as.data.frame(ScoresDf)
df_Scores
```

```
##     names scores passed
## 1    Desa     20  FALSE
## 2 Ayoung     60   TRUE
## 3 Nusrat     80   TRUE
## 4    Emma    100   TRUE
```

```
is.data.frame(df_Scores) #confirming it is a data frame
```

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

```
df_Scores
```

```
##    names scores passed
## 1   Desa     20  FALSE
## 2 Ayoung     60   TRUE
## 3 Nusrat     80   TRUE
## 4   Emma    100   TRUE
```

```
colnames(df_Scores) <- c("Name of Students","Percentage","Passed?")
df_Scores
```

```
##   Name of Students Percentage Passed?
## 1             Desa         20   FALSE
## 2           Ayoung         60    TRUE
## 3           Nusrat         80    TRUE
## 4             Emma        100    TRUE
```

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

   Answer: This has several classes, including Character, Integer, and Logical. A matrix could only have one type of class.

10. Create a function with an if/else statement. Your function should take a **vector** of test scores and print (not return) whether a given 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.

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

```
AreYouPassing <- function(v)
  {
  ifelse(v>= 50,"TRUE","FALSE")
  }

AreYouPassing(80) #test
```

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

```
AreYouPassing(50) #test
```

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

```
AreYouPassing(scores) #test
```

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

```r
#11.

AreYouPassing(scores)
```

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

```r
scores #to compare outputs above
```

```
## [1]  20  60  80 100
```

```r
#needed in general, not this question
knitr::opts_chunk$set(echo = TRUE)
```

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

    Answer: ifelse worked because if you input vectors, you get vectors back.