Assignment 2: Coding Basics

Lehe, Xu

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 Generate a sequence named hun_sequence, contaning numbers from one to 100, increasing by fours.
hun_sequence <- seq(1, 100, 4)

hun_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
## [24] 93 97
```

```
#2 Find the mean and median of hun_sequence
mean(hun_sequence)
```

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

```
median(hun_sequence)
```

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

```
#3 Determine whether the mean of hun_sequence is greater than the median of hun_sequence
mean(hun_sequence)>median(hun_sequence)
```

```
## [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.

```
#5
student_name <- c("Lily","Bily","Cici","Andy") #names of students (Nominal data)
test_score<-c(51, 55, 52, 50) # test scores out of a total 100 points (discrete data)
test_score>=50
```

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

```
score_df <- data.frame("Name"=student_name,"Score"=test_score)
score_df
```

```
##   Name Score
## 1 Lily    51
## 2 Bily    55
## 3 Cici    52
## 4 Andy    50
```

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

   Answer: In a data frame the columns contain different types of data, but in a matrix all the elements are the same type of data.Also, each row in data frame is parallel to each other; whereas in matrix, data are all independent.

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.

```
Scorejudge <- function(x){
  ifelse(x>=50, "TRUE", "FALSE")

}
```

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

```
Score <- Scorejudge(test_score); Score
```

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

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

    Answer: ifelse worked, but 'if' and 'else' not. Becuasue ifelse can be used to treat vector, but 'if' and 'else' cannot.