

# Assignment 2: Coding Basics

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## 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.*

```
Sequence1<-seq(1,100) #assigning and sequencing numbers from 1-100  
Sequence1#return the sequence
```

```
## [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18  
## [19] 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36  
## [37] 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54  
## [55] 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72  
## [73] 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90  
## [91] 91 92 93 94 95 96 97 98 99 100
```

*#2.*

```
mean1<-mean(Sequence1)#assigning and calculating the mean of the sequence  
mean1#return the mean
```

```
## [1] 50.5
```

```
median1<-median(Sequence1)#assigning and calculating the median  
median1#return median
```

```
## [1] 50.5
```

*#3.*

```
mean1 > median1
```

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

```
#conditional statement
#if statement is true, r returns "TRUE"
#else returns "FALSE" like in this case where they are equal.
```

## 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.

```
Names<-list("Jane","James", "John", "Josie") #characters
Scores<-list(65, 48, 73, 84) #numeric
Passed<-list("T","F","T","T") #characters
DF<-cbind(Names, Scores, Passed)
colnames(DF)<-c("Student Name", "Test Scores", "Passed?")
```

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

Answer: a matrix must contain data of the same mode and length within each column, whereas a data frame can have different modes within each column.

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.

```
#try if/else statement
pass<- function(x){
  if (x<50){
    print("False")
  }
  else{print("True")}
}

Student1<-pass(Scores[1])
```

```
## [1] "True"
```

```
Student2<-pass(Scores[2])
```

```
## [1] "False"
```

```
Student3<-pass(Scores[3])
```

```
## [1] "True"
```

```
Student4<-pass(Scores[4])
```

```
## [1] "True"
```

```
#try ifelse statements
pass1<-function(x){
  ifelse(x<50, print("False"),print("True"))
```

```

}

Student1.1<-pass1(Scores[1])

## [1] "True"
Student2.1<-pass1(Scores[2])

## [1] "False"
Student3.1<-pass1(Scores[3])

## [1] "True"
Student4.1<-pass1(Scores[4])

## [1] "True"

```

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

Answer: at first “if/else” works whereas “ifelse” does not. My suspicion was that “ifelse” only returns numeric values or the statement must contain the same modes. The “Help” tab explains it as “The mode of the answer will be coerced from logical to accommodate first any values taken from yes and then any values taken from no”. The returned value for my code is `log(0)`, meaning this answer is undefined and cannot be interpreted. I adjusted my code and they both work now.