# 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. create sequence (from to by), and give it a name
incrument4<- seq(1, 100,4)

#2. compute mean and median
mean(incrument4)
```

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

```
median(incrument4)
```

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

```
#3. determine whether mean is greater than median
mean(incrument4) > median(incrument4)
```

```
## [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.

```
student_name<-c("A","B","C","D") #Character
test_score<-c(92,85,78,43) #Numeric
passed<-c(TRUE,TRUE,TRUE,FALSE) #Logical

Gradebook <- data.frame(student_name,test_score,passed)
print(Gradebook)
```

```
##   student_name test_score passed
## 1            A         92   TRUE
## 2            B         85   TRUE
## 3            C         78   TRUE
## 4            D         43  FALSE
```

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

   Answer: data frame columns can have different modes (character, numeric, integer, logical, complex), but matrix only have one data type

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.

```
passing<-function(score){ifelse(score>50,TRUE,FALSE)}
print(passing(test_score))
```

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

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

    Answer: the "ifelse" wored because it returns a logic for all values (in the vector). On the other hand, the "if" and "else" only return the result for the first value.