

# Assignment 2: Coding Basics

Dili Li

## OVERVIEW

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

## Directions

1. Rename this file `<FirstLast>_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 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 the sequence from 1 to 100 increasing by 4
math_sequence1 <- seq(1,100,4)
seq(1,100,4)
```

```
## [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. computing the numbers of mean and median
mean(seq(1,100,4))
```

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

```
median(seq(1,100,4))
```

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

```
#3.determining whether mean of the sequence is greater than median of the sequence
mean(seq(1,100,4)) > median(seq(1,100,4))
```

```
## [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.

```
#
a <- c("A","B","C","D") # character vectors
#
b <- c(97,57,34,46) # integer vectors

c <- c(TRUE, TRUE, FALSE, FALSE) # character vectors
d <- data.frame(a,b,c)

# colnames(d) <- colnames("names of student" , "scores" , "Pass or Not")
d
```

```
##   a  b    c
## 1 A 97  TRUE
## 2 B 57  TRUE
## 3 C 34 FALSE
## 4 D 46 FALSE
```

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

Answer: matrices can only contain a single class of data, while data frames can consist of many different classes of data

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.

```
pass_or_not <- function(x){
  ifelse(x>50,TRUE,FALSE)
}
b <- c(97,57,34,46)
whether_pass_or_not <- pass_or_not(b)
#whether_pass_or_not
```

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

Answer: `ifelse` worked. Since `ifelse` could check every elements in a vector, “`if`” and “`else`” only could check an element in a vector at one time.