

# Assignment 2: Coding Basics

Jiawei Liang

## 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.Generate a sequence from 1 to 100,which increases by 4.  
seq(1,100, by=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.Name this sequence 'sequence_1_to_100'.  
sequence_1_to_100<-seq(1,100,by=4)  
#3. compute the mean and median of this sequence.  
mean(sequence_1_to_100)
```

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

```
median(sequence_1_to_100)
```

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

```
#4.Ask R whether mean is greater than median  
mean(sequence_1_to_100)>median(sequence_1_to_100)
```

```
## [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.

```
#1.Vector of names
aaa <- c("Albert","Bill","Carl","David")
#2.Vector of grades
bb <- c(95, 72, 48, 85)
#3.Vector of whether or not they have passed the test
ccc <- c('TRUE','TRUE','FALSE','TRUE')
#4.Combine vectors into a data frame and call it Student_transcript
Studenttranscript <- data.frame(aaa,bb,ccc)
#5.label the columns of my data 'Name' 'Scores' 'Pass'
names(Studenttranscript) <- c("Name","Scores","Pass");
```

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

Answer Things that they contain are different. A data frame can contain characters, numbers, factors and times all at once. It could contains different things. A matrix can only contain a single type.

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.

```
ifelse(bb >= 50,'TRUE','FALSE')
```

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

12. QUESTION: Which option of **if** and **else** vs. **ifelse** worked? Why? > Answer 'ifelse'works. For 'if' and 'else',it checks whether a logical condition (i.e.  $b \geq 50$ ) is TRUE. If the logical condition is not TRUE, apply the content within the else statement (i.e. return the sentence "If condition was FALSE"). For 'ifelse',it checks the logical condition we want to test. What should happen in case the logical condition is TRUE. What should happen in case the logical condition is FALSE. In this question, we need to check the result after the logical is true or false. So ifelse is better.