

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 last name into the file name (e.g., “Salk_A02_CodingBasics.Rmd”) prior to submission.

The completed exercise is due on Tuesday, January 21 at 1:00 pm.

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.  
q1 <-seq(from=1,to=100,by=4) #create a sequence from 1 to 100, increasing by fours.  
q1
```

```
## [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.  
mean(q1)#get mean of the sequence
```

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

```
median(q1)#get median of the sequence
```

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

```
#3.  
mean(q1)>median(q1)#compare mean to median
```

```
## [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.
v1 <- c("Alice" , "Bob" , "Candy", "Diane")# character vector

v2 <- c(49, 69, 79, 89)# numeric vector
v3 <- c(FALSE, TRUE, TRUE, TRUE)#logical vector
#7.
class.grade <- data.frame(v1, v2, v3)
#8.
names(class.grade)<- c("names", "scores", "Passed"); View(class.grade)
```

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

Answer: In a data frame, columns can have different modes (e.g., numeric and factor), while a matrix can only contain elements of the same 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.

```
#10
#use ifelse
lo1 <- function(x) {ifelse(x>50,TRUE, FALSE)}
lo1(x = v2)
```

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

```
#use if else
lo <- function(x) {
  if(x > 50) {
    print(TRUE)
  }
  else {
    print(FALSE)
  }
}
lo(x = v2)
```

```
## Warning in if (x > 50) {: the condition has length > 1 and only the first
## element will be used
```

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

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

Answer: `Ifelse` worked because it returned all the results. `If` and `else` did not work as it only returned the first results.