

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.

```
seq1 <- seq(1, 100, 4) # assigning sequence a name
seq1 # seeing the sequence
```

```
## [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.

```
mean(seq1) #finding the mean of the sequence
```

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

```
median(seq1) #finding the median of the sequence
```

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

#3.

```
mean(seq1) > median(seq1)
```

```
## [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 and 6

```
vector1 <- c("Sara", "Bob", "Susan", "Frank") #character vector  
vector1
```

```
## [1] "Sara" "Bob" "Susan" "Frank"
```

```
vector2 <- c(98, 75, 45, 84) #numeric vector  
vector2
```

```
## [1] 98 75 45 84
```

```
vector3 <- c(TRUE, TRUE, FALSE, TRUE) #logical vector  
vector3
```

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

#7

```
dataframe1 <- data.frame(vector1,vector2,vector3) #assigning to data frame
```

#8

```
names(dataframe1) <- c("Student Name","Grade","Passed"); View(dataframe1)
```

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

Answer:

A data frame can have columns of different vector types such as numeric, logical, and character. A matrix can only have vectors of the same type. Both however, are 2 dimensional.

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

```
test.score <- function(vector2) {  
  if(vector2 >= 50) {  
    TRUE  
  }  
  else {  
    FALSE  
  }  
}
```

```
test.score2 <- function(vector2){
```

```
  ifelse(vector2 >= 50, "TRUE", "FALSE") #log_exp, if TRUE, if FALSE
  print(vector2)
}

find.passing.grades <- (function(vector2) {
  print(ifelse(vector2 >= 50, "TRUE", "FALSE"),vector2)
})
```

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

Answer: