

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.  
#use sequence function to generate sequence. 1 being start, 100 being end,  
#and 4 being how much to increase by.  
sequence <- seq(1,100,4)  
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.  
#use summary function to find mean and median of the sequence.  
summary(sequence)
```

```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.   
##         1      25      49      49      73      97
```

```
#3.  
#test out logic to see if greater than or less than  
mean(sequence) > median(sequence)
```

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

```
mean(sequence) < median(sequence)
```

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

```
#both false try equal to  
mean(sequence) == median(sequence)
```

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

```
#they are equal
```

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.

```
#create vectors of student names, scores and pass or not  
names <- c("Joan", "Amy", "Casey", "Beth")  
score <- c(40, 70, 80, 90)  
pass <- c(FALSE, TRUE, TRUE, TRUE)  
  
#combine vectors into dataframe  
test_results <- cbind(names, score, pass)  
test_results
```

```
##      names  score pass  
## [1,] "Joan"  "40"  "FALSE"  
## [2,] "Amy"   "70"   "TRUE"  
## [3,] "Casey" "80"   "TRUE"  
## [4,] "Beth"  "90"   "TRUE"
```

```
#rename columns  
colnames(test_results) <- c("Name", "Test_Score", "Pass")  
test_results
```

```
##      Name  Test_Score Pass  
## [1,] "Joan"  "40"      "FALSE"  
## [2,] "Amy"   "70"      "TRUE"  
## [3,] "Casey" "80"      "TRUE"  
## [4,] "Beth"  "90"      "TRUE"
```

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

Answer: in a matrix the data has to be the same mode or 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_grade <- function(x){  
  ifelse(x >= 50, TRUE, FALSE)  
}  
  
#test function on vector of scores  
passing_grade(score)
```

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

```
#test on individual score  
passing_grade(60)
```

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

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

Answer: `ifelse` worked because its a function where the input is either TRUE or FALSE based on the logical expression which is what we are trying to determine - our logical expression being is the exam grade greater or equal to 50. You might be able to get 'if' 'else' to work but it would be more unnecessary lines of code when `ifelse` works and makes more intuitive sense.