

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. Generated a sequence of numbers from one to 100, increasing by fours  
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
```

```
My_sequence <- seq(1,100,4)
```

```
#2. Compute the mean and median of this sequence  
mean(My_sequence)
```

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

```
median(My_sequence)
```

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

```
#3. Ask R to determine whether the mean is greater than the median.  
mean(My_sequence) > median(My_sequence)
```

```
## [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.

```
Vector_1 <- c("Abby", "Barbie", "Clyde", "Susan") #character vector
Vector_2 <- c("22", "33", "60", "99") #numeric vector
Vector_3 <- c("FALSE", "FALSE", "TRUE", "TRUE") #logical vector

Student_scores <- data.frame(Vector_1, Vector_2, Vector_3)
names(Student_scores) <- c("students", "grades", "pass")
Student_scores
```

```
##   students grades pass
## 1     Abby     22 FALSE
## 2    Barbie     33 FALSE
## 3    Clyde     60  TRUE
## 4     Susan     99  TRUE
```

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

Answer: A data frame is more general and can house many types of vectors, whereas a matrix is more streamlined and can only house one type of vector.

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_score <- function(x) {
  ifelse(x>=50, TRUE, FALSE)
}

Passing_score(Vector_2)
```

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

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

Answer: “if” and “else” only tell me whether the first piece of data in the series is true or false, so they do not work. “ifelse” tells me whether every piece of data in the vector is true or false, so it does work.