

Assignment 2: Coding Basics

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OVERVIEW

This exercise accompanies the lessons in Environmental Data Analytics on coding basics.

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.

```
Sequence_of_four <- seq(1,100,4) #assign sequence to a variable
```

#2.

```
mean(Sequence_of_four) #calculate the mean of the variable/ sequence
```

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

```
median(Sequence_of_four) #calculate the median of the variable/ sequence
```

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

#3.

```
mean(Sequence_of_four) > median(Sequence_of_four) #ask if the mean of the sequence is greater than the 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.

```
name <- c("Bob", "Rob", "Cob", "Gob") #character vector
test_score <- c(5,20,8,99) # integer vector
pass <- c(FALSE, FALSE, FALSE, TRUE) #logical vector
class_scores <- data.frame(name, test_score, pass)
names(class_scores)[names(class_scores) == 'name'] <- 'Student Name'
names(class_scores)[names(class_scores) == 'test_score'] <- 'Test Score'
names(class_scores)[names(class_scores) == 'pass'] <- 'Pass?'
```

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

Answer: Data frame is different because it can store different classes of data. In this case, the data frame stores three different classes of data (logical, character, and integer). A matrix will only stores one class.

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.

```
passing_grade <- function(x) {
  ifelse(x<50, "True", "False")}
```

```
passing_grade(test_score)
```

```
## [1] "True" "True" "True" "False"
```

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

Answer: ifelse worked as it can pass vectors. The separate 'if' and 'else' functions can only pass separate integers.