

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, Part 1

1. Generate a sequence of numbers from one to 30, increasing by threes. Assign this sequence a name.

```
seq(1,30,3) # This function is creating a sequence of numbers 1 to 30 by 3
```

```
## [1] 1 4 7 10 13 16 19 22 25 28
```

```
sequence_by_3 <- seq(1,30,3)  
# This code chunk is indicating that the sequence generated.  
# The seq function is now assigned to the name sequence_by_3.
```

2. Compute the mean and median of this sequence.

```
mean(sequence_by_3)
```

```
## [1] 14.5
```

```
# This code chunk is referencing the object to find the mean.
```

```
median(sequence_by_3)
```

```
## [1] 14.5
```

```
# This code chunk is finding the median of the object.
```

3. Ask R to determine whether the mean is greater than the median.

```
mean(sequence_by_3)>median(sequence_by_3)
```

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

```
# This code chunk is asking if the mean is greater than the median.  
# Since they are both 14.5, the answer is false.
```

4. Insert comments in your code to describe what you are doing.

```
#1. # This function is creating a sequence of numbers 1 to 30 by 3  
  
#2. # This code chunk is referencing the object to find the mean.  
  
#3. # This code chunk is asking if the mean is greater than the median.  
# Since they are both 14.5, the answer is false.
```

Basics, Part 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.

```
students <- c('Bob', 'Joe', 'Sam', 'Corey') # This is a character vector  
scores <- c(85,45,95,90) # This is a numerical vector.  
outcome <- c(T, F, T, T) # This is a character vector.
```

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.

```
students_scores <- data.frame(students, scores, outcome)  
print(students_scores)
```

```
##   students scores outcome  
## 1      Bob     85     TRUE  
## 2       Joe     45    FALSE  
## 3       Sam     95     TRUE  
## 4     Corey     90     TRUE
```

8. Label the columns of your data frame with informative titles.
9. QUESTION: How is this data frame different from a matrix?

Answer:

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

Answer: