

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.
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.  
seq(1,30,3)    #generating a sequence from 1 to 30 by 3
```

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

```
seq_by_3 <- seq(1,30,3)    #naming the sequence "seq_by_3"  
  
#2.  
mean(seq_by_3)    #finding the mean of the sequence
```

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

```
median(seq_by_3)    #finding the median of the sequence
```

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

#3.

```
mean(seq_by_3) > median(seq_by_3)    #asking a conditional statement if the mean is greater than the m
```

```
## [1] 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.
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 is a character vector
name <- c("Amy", "Bob", "Carl", "David")
#score is a numeric vector
score <- c(60,70,40,80)
#pass is a logical vector
pass <- score >= 50

test_score <- data.frame(name, score, pass)

test_score
```

```
##   name score pass
## 1  Amy    60  TRUE
## 2  Bob    70  TRUE
## 3 Carl    40 FALSE
## 4 David    80  TRUE
```

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

Answer: Matrix is homogeneous while data frame is heterogeneous. This means that matrix can only store one type of data whereas data frame can store different types of data.

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.

```
#ifelse
pass_fail <- ifelse(score >= 50, "PASS", "FAIL")
print(pass_fail)
```

```
## [1] "PASS" "PASS" "FAIL" "PASS"
```

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

Answer: 'ifelse' would work instead of "if" and "else" because score is a vector. "Ifelse" is for vector whereas "if" and "else" is for scalar.