

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.
seq100 <- seq(1, 100, 4) #making an object of the sequence

#2.
meanseq100 <- mean(seq100) #computing the mean of the sequence
medseq100 <- median(seq100) #computing the median of sequence

#3.
meanseq100 > medseq100 #false
```

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

```
meanseq100 < medseq100 #false
```

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

```
meanseq100 == medseq100 #true
```

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

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.

```
students <- c("Homer", "Marge", "Lisa", "Bart") #character
scores <- c(62, 89, 99, 25) #numeric
pass <- c(TRUE, TRUE, TRUE, FALSE) #logical

grading <- data.frame ('students'=c("Homer", "Marge", "Lisa", "Bart"), 'scores'=c(62, 89, 99, 25), 'pass')
grading #viewing the data frame
```

```
##  students scores pass
## 1    Homer     62  TRUE
## 2    Marge     89  TRUE
## 3     Lisa     99  TRUE
## 4     Bart     25 FALSE
```

```
class(grading) #verifying that "grading" is a data frame
```

```
## [1] "data.frame"
```

```
transposed.grading <- t(grading) #created transposed version to see if this would change anything
```

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

Answer: The main difference between a matrix and a data frame is that data frames can have multiple classes of data where as matrices contain only data of the same 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.

```
passfail <- function(x) {
  if(x > 50)
    x = "PASS"
  else
    x = "FAIL"
}
```

```

passfail <- function(x){
  ifelse(x<50, "FAIL", "PASS")
}

#neither of these functions are picking up on a fail grade from bart
#tried it with both original and transposed data frame
homergrade <- passfail("grading$homer"); homergrade

```

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

```
margegrade <- passfail("grading$marge"); margegrade
```

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

```
lisagrade <- passfail("grading$lisa"); lisagrade
```

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

```
bartgrade <- passfail("grading$bart"); bartgrade #says pass but should say fail
```

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

```

results <- passfail("grading$scores")
passfail(scores) #this does work... but can't get it to run on the whole df...

```

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

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

Answer: ifelse worked because it checked each item in the vector as opposed to just the first one, as if and else would do individually