

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 last name into the file name (e.g., “Salk_A02_CodingBasics.Rmd”) prior to submission.

The completed exercise is due on Tuesday, January 21 at 1:00 pm.

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. creating a vector that has this sequence of numbers
vector1 <- c(1,5,9,13,27,31,35,39,43,47,51,55,59,63,67,71,74,79,83,87,91,95,99)
#2. calculating the mean and median of the vector created
mean(vector1)
```

```
## [1] 53.21739
```

```
median(vector1)
```

```
## [1] 55
```

```
#3. asking R whether mean of vector1 is greater than median of vector1
mean(vector1) > median(vector1)
```

```
## [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_name <- c("Kyle","Alicia","Julia","Cai May") # character vector
vector_score <- c(78,95,98,83) # numeric vector
vector_pass <- c(TRUE,TRUE,TRUE,TRUE) #logical vector
dataframe1 <- data.frame(vector_name,vector_score,vector_pass)
names(dataframe1) <- c("Name","Score","Pass?"); View(dataframe1)
```

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

Answer: A data frame is more general than a matrix and columns can have different modes of data (for example, numeric and logical), whereas a matrix needs to have data of the same mode.

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.

```
grade2 <- function(x) {
  ifelse(x > 50, "PASS","FAIL") }

grade2(vector_score)
```

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

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

Answer: The 'ifelse' option worked. The 'if' command can only be run if a vector has one object. Since the vector created for students' scores has four objects, the 'if' and 'else' option returned a warning and would not work.