

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.

```
# Sequence of numbers from one to 100, increasing by fours
seq(1,100,4)
```

```
## [1] 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
```

```
#1. 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
```

```
### Calcualte mean and media
X<- seq(1,100,4)
mean(X)
```

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

```
median(X)
```

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

```
#2. mean = 49, median= 49

### Determine whether the mean is greater than the median

meanX <- mean(X)
medianX<- median(X)

meanX > medianX

## [1] FALSE

#3. 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.

```
#5. Create a series of vectors
Student<- c("Sam", "Zaza", "Nana", "Dim")
Test_score<- c(50,40,80,70)
Passed<- Test_score>=50

#6. Types of vectors
# Student is character vector
# Test_score is a numeric vector
# Passed is a logical vector

#7. Combine each of the vectors into a data frame
Student_grade<-data.frame(Student,Test_score,Passed)

#8. Label the columns of data frame
names(Student_grade)<-c("Student_name", "Test_score", "Passed" )
```

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

Answer:A data frame is used for storing data tables. It a list of vectors of equal length. Data frame can consist of different types of vectors such as character vector, numeric vector, and logical vector. However, a matrix can consist of only one data type (eg. numeric or logic)

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(Test_score) {  
  result <- ifelse(Test_score >= 50, TRUE, FALSE)  
  return(result)  
}  
  
Passing_grade(Test_score)
```

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

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

Answer: `ifelse` worked because it takes the command to compare the test scores with the value of 50. With the condition of passing grade to be equal or more than 50, it will provide `TRUE` if the test score equal to or greater than 50, and provide `FALSE` if the test score is lower than 50.