

Rathmell_Dori_A02_CodingBasics.Rmd

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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.

```
#1.
seq(1,100,4) # Sequence function creates a sequence from 1-100, skips by 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

Sequence1 <- seq(1,100,4) #assigned the sequence a name

#2.
mean(Sequence1) # mean command finds the average of Sequence1

## [1] 49

median(Sequence1) # median command finds the median of Sequence1

## [1] 49

#3.
mean (Sequence1) > median(Sequence1)

## [1] FALSE

# greater than tool compares size of mean and median of Sequence1
```

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.

```
#6
vector_names <- c('Dori', 'Megan', 'Emma', 'Kallie') #character vector
vector_grades <- c(46,98,97,96) #numeric vector
vector_pass <- c(FALSE,TRUE,TRUE,TRUE) #logical vector
#created vectors for students, their grades, and whether or not they passed

a <- vector_names
b <- vector_grades
c <- vector_pass
#assigned each vector a variable a, b, or c.

#7
dataframegrades <- data.frame(a,b,c) #created a dataframe using variables

#8
names(dataframegrades) <- c("Student Names","Grade","Pass/Fail")
#assigning each column in the dataframe a name
print(dataframegrades)

##   Student Names Grade Pass/Fail
## 1         Dori   46     FALSE
## 2         Megan   98      TRUE
## 3          Emma   97      TRUE
## 4        Kallie   96      TRUE

#displaying the dataframe
```

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

Answer: Matrices can only function with one data type, datasets can hold more than one kind of data type. In this dataset we use both numeric and text values.

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_grades <- function(x){
  if (x > 50)
    print('TRUE')
  else
    print('FALSE')
  #if else statements print TRUE if value is above 50, FALSE if below 50
}
Passing_grades2 <- function(x)
  ifelse(x > 50, 'TRUE', 'FALSE')
```

```
#ifelse command tests if x > 50, if yes prints 'TRUE', if no prints 'FALSE'
```

```
Passing_grades2(vector_grades)#applies Passing_grades2 function to vector_grades
```

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

```
#Passing_grades(vector_grades)
```

```
#The if and else statements fail since vector_grades has multiple values
```

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

Answer: ‘if’ and ‘else’ statements only work for single values, the ‘ifelse’ statement can evaluate an entire vector to determine if it meets the function criteria.