RWorksheet_Ceniza#4b

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2023-11-07

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Using Loop Function

for() loop ### 1. Using the for loop, create an R script that will display a 5x5 matrix as shown in

Figure 1. It must contain vectorA = [1,2,3,4,5] and a 5 x 5 zero matrix. Hint Use abs() function to get the absolute value

```
vectorA <- c(1, 2, 3, 4, 5)

matrixB <- matrix(0, nrow = 5, ncol = 5)

for (i in 1:5) {
  for (j in 1:5) {
    matrixB[i, j] <- abs(vectorA[i] - vectorA[j])
  }
}

matrixB
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    0    1    2    3    4
## [2,]    1    0    1    2    3
## [3,]    2    1    0    1    2
## [4,]    3    2    1    0    1
## [5,]    4    3    2    1    0
```

2. Print the string "*" using for() function. The output should be the same as shown

in Figure

```
num2 <- 5

for (i in 1:num2) {
  cat(paste(rep("*", i), collapse = ""), "\n")
}
```

```
## *
## **
## ***
## ****
## *****
```

3. Get an input from the user to print the Fibonacci sequence starting from the 1st input up to 500. Use repeat and break statements. Write the R Scripts and its output.

```
b<- as.numeric(readline("Enter the number of terms you want in the Fibonacci sequence: "))
```

```
## Enter the number of terms you want in the Fibonacci sequence:
```

```
a <- 0
b<-1
cat("Fibonacci sequence:\n",a)
```

```
## Fibonacci sequence:
##  0
```

```
count <- 2
repeat {
  next_term <- a + b


  if (next_term > 500) {
    break
  }


  cat(" ", next_term)
  a <- b
  b <- next_term
}
```

```
##   1  2  3  5  8  13  21  34  55  89  144  233  377
```

Using Basic Graphics (plot(),barplot(),pie(),hist())

4. Import the dataset as shown in Figure 1 you have created previously.

a. What is the R script for importing an excel or a csv file? Display the first 6 rows of the dataset? Show your codes and its result

```
library(readxl)
Shoes <- read_excel("Shoes.xlsx")
Shoes
```

```
## # A tibble: 28 x 3
##    `Shoe size` Height Gender
##          <dbl>  <dbl> <chr>
##  1         6.5   66   F
##  2         9     68   F
##  3         8.5   64.5 F
##  4         8.5   65   F
##  5        10.5   70   M
##  6         7     64   F
##  7         9.5   70   F
##  8         9     71   F
##  9        13     72   M
## 10         7.5   64   F
## # i 18 more rows
```

```
head(Shoes)
```

```
## # A tibble: 6 x 3
##   `Shoe size` Height Gender
##         <dbl>  <dbl> <chr>
## 1         6.5   66   F
## 2         9     68   F
## 3         8.5   64.5 F
## 4         8.5   65   F
## 5        10.5   70   M
## 6         7     64   F
```

b. Create a subset for gender(female and male). How many observations are there in Male? How about in Female? Write the R scripts and its output.

```
subsetMale <- subset(Shoes,Gender == "M")
subsetMale
```

```
## # A tibble: 14 x 3
##    `Shoe size` Height Gender
##          <dbl>  <dbl> <chr>
##  1         10.5   70   M
##  2         13     72   M
##  3         10.5   74.5 M
##  4         12     71   M
##  5         10.5   71   M
##  6         13     77   M
##  7         11.5   72   M
##  8         10     72   M
##  9          8.5   67   M
## 10         10.5   73   M
## 11         10.5   72   M
## 12         11     70   M
## 13          9     69   M
## 14         13     70   M
```

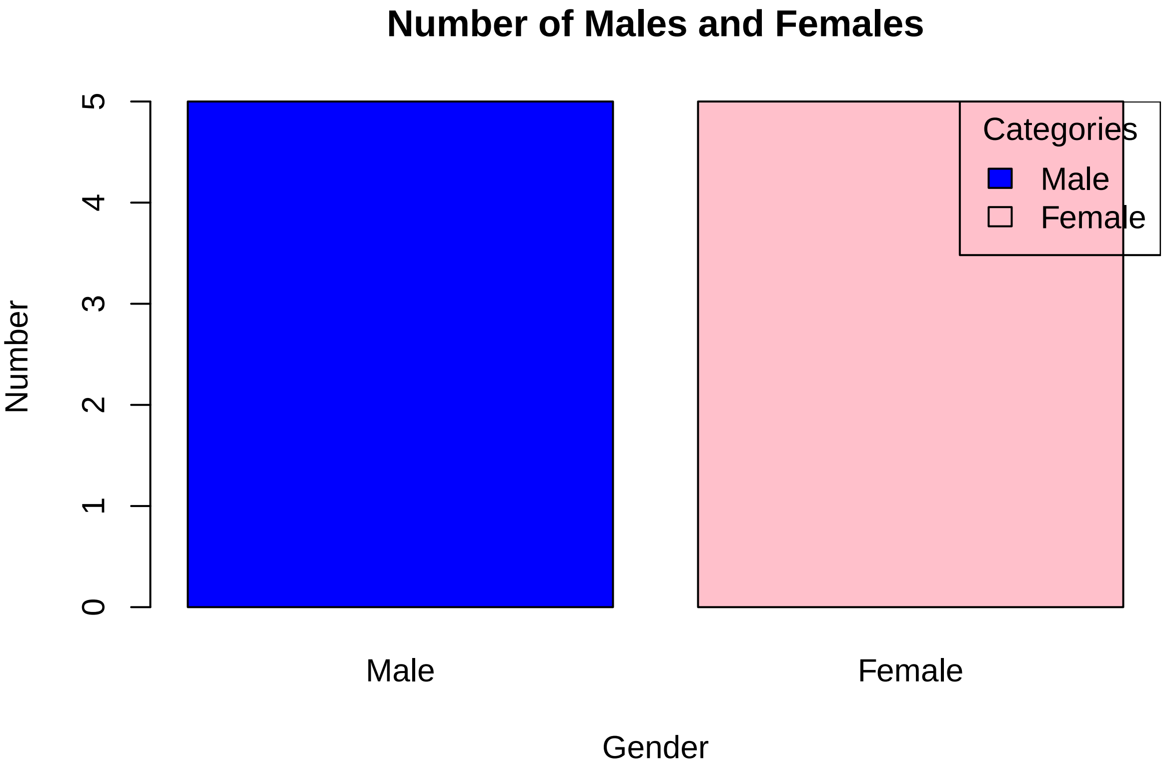
```
subsetFemale <- subset(Shoes,Gender == "F")
subsetFemale
```

```
## # A tibble: 14 x 3
##    `Shoe size` Height Gender
##          <dbl>  <dbl> <chr>
##  1          6.5   66   F
##  2          9     68   F
##  3          8.5   64.5 F
##  4          8.5   65   F
##  5          7     64   F
##  6          9.5   70   F
##  7          9     71   F
##  8          7.5   64   F
##  9          8.5   67   F
## 10          8.5   59   F
## 11          5     62   F
## 12          6.5   66   F
## 13          7.5   64   F
## 14          8.5   69   F
```

```
There are 14 observation in Male and 14 observation also in Female
```

c. Create a graph for the number of males and females for Household Data. Use plot(), chart type = barplot. Make sure to place title, legends, and colors. Write the R scripts and its result.

```r
library(ggplot2)
library(readr)
HouseholdData<-read.csv("HouseholdData.csv")

bm <- subset(HouseholdData, Sex == "Male")
bf <- subset(HouseholdData, Sex == "Female")
colors <- c("blue", "pink")

barplot(
  c(nrow(bm), nrow(bf)),
  names.arg = c("Male","Female"),
  col = colors,
  main = "Number of Males and Females",
  xlab = "Gender",
  ylab = "Number"
)

legend("topright", legend = c("Male","Female"), fill = colors, title = "Categories")
```

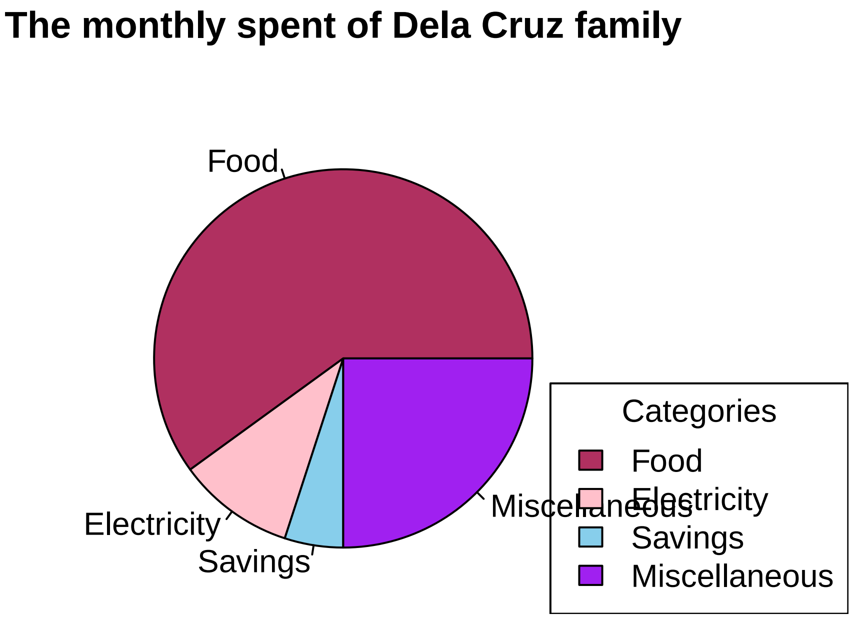


5. The monthly income of Dela Cruz family was spent on the following:

a. Create a piechart that will include labels in percentage.Add some colors and title of the chart. Write the R scripts and show its output.

```r
data <- c(60, 10, 5, 25)
labels <- c("Food", "Electricity", "Savings", "Miscellaneous")
```

```
colors <- c("maroon", "pink", "skyblue", "purple")


pie(data, labels = labels, col = colors)

legend("bottomright", legend = labels, fill = colors, title = "Categories")

title("The monthly spent of Dela Cruz family")
```



6. Use the iris dataset.

```
data(iris)
iris
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 1            5.1         3.5          1.4         0.2     setosa
## 2            4.9         3.0          1.4         0.2     setosa
## 3            4.7         3.2          1.3         0.2     setosa
## 4            4.6         3.1          1.5         0.2     setosa
## 5            5.0         3.6          1.4         0.2     setosa
## 6            5.4         3.9          1.7         0.4     setosa
## 7            4.6         3.4          1.4         0.3     setosa
## 8            5.0         3.4          1.5         0.2     setosa
## 9            4.4         2.9          1.4         0.2     setosa
## 10           4.9         3.1          1.5         0.1     setosa
## 11           5.4         3.7          1.5         0.2     setosa
## 12           4.8         3.4          1.6         0.2     setosa
## 13           4.8         3.0          1.4         0.1     setosa
## 14           4.3         3.0          1.1         0.1     setosa
## 15           5.8         4.0          1.2         0.2     setosa
## 16           5.7         4.4          1.5         0.4     setosa
## 17           5.4         3.9          1.3         0.4     setosa
## 18           5.1         3.5          1.4         0.3     setosa
## 19           5.7         3.8          1.7         0.3     setosa
## 20           5.1         3.8          1.5         0.3     setosa
## 21           5.4         3.4          1.7         0.2     setosa
## 22           5.1         3.7          1.5         0.4     setosa
## 23           4.6         3.6          1.0         0.2     setosa
## 24           5.1         3.3          1.7         0.5     setosa
## 25           4.8         3.4          1.9         0.2     setosa
## 26           5.0         3.0          1.6         0.2     setosa
## 27           5.0         3.4          1.6         0.4     setosa
## 28           5.2         3.5          1.5         0.2     setosa
## 29           5.2         3.4          1.4         0.2     setosa
## 30           4.7         3.2          1.6         0.2     setosa
## 31           4.8         3.1          1.6         0.2     setosa
## 32           5.4         3.4          1.5         0.4     setosa
## 33           5.2         4.1          1.5         0.1     setosa
## 34           5.5         4.2          1.4         0.2     setosa
## 35           4.9         3.1          1.5         0.2     setosa
## 36           5.0         3.2          1.2         0.2     setosa
## 37           5.5         3.5          1.3         0.2     setosa
## 38           4.9         3.6          1.4         0.1     setosa
## 39           4.4         3.0          1.3         0.2     setosa
## 40           5.1         3.4          1.5         0.2     setosa
## 41           5.0         3.5          1.3         0.3     setosa
## 42           4.5         2.3          1.3         0.3     setosa
## 43           4.4         3.2          1.3         0.2     setosa
## 44           5.0         3.5          1.6         0.6     setosa
## 45           5.1         3.8          1.9         0.4     setosa
## 46           4.8         3.0          1.4         0.3     setosa
## 47           5.1         3.8          1.6         0.2     setosa
## 48           4.6         3.2          1.4         0.2     setosa
## 49           5.3         3.7          1.5         0.2     setosa
## 50           5.0         3.3          1.4         0.2     setosa
## 51           7.0         3.2          4.7         1.4 versicolor
## 52           6.4         3.2          4.5         1.5 versicolor
## 53           6.9         3.1          4.9         1.5 versicolor
## 54           5.5         2.3          4.0         1.3 versicolor
## 55           6.5         2.8          4.6         1.5 versicolor
## 56           5.7         2.8          4.5         1.3 versicolor
## 57           6.3         3.3          4.7         1.6 versicolor
## 58           4.9         2.4          3.3         1.0 versicolor
## 59           6.6         2.9          4.6         1.3 versicolor
## 60           5.2         2.7          3.9         1.4 versicolor
## 61           5.0         2.0          3.5         1.0 versicolor
## 62           5.9         3.0          4.2         1.5 versicolor
## 63           6.0         2.2          4.0         1.0 versicolor
## 64           6.1         2.9          4.7         1.4 versicolor
## 65           5.6         2.9          3.6         1.3 versicolor
## 66           6.7         3.1          4.4         1.4 versicolor
## 67           5.6         3.0          4.5         1.5 versicolor
## 68           5.8         2.7          4.1         1.0 versicolor
## 69           6.2         2.2          4.5         1.5 versicolor
## 70           5.6         2.5          3.9         1.1 versicolor
## 71           5.9         3.2          4.8         1.8 versicolor
## 72           6.1         2.8          4.0         1.3 versicolor
## 73           6.3         2.5          4.9         1.5 versicolor
## 74           6.1         2.8          4.7         1.2 versicolor
## 75           6.4         2.9          4.3         1.3 versicolor
## 76           6.6         3.0          4.4         1.4 versicolor
## 77           6.8         2.8          4.8         1.4 versicolor
## 78           6.7         3.0          5.0         1.7 versicolor
## 79           6.0         2.9          4.5         1.5 versicolor
## 80           5.7         2.6          3.5         1.0 versicolor
## 81           5.5         2.4          3.8         1.1 versicolor
## 82           5.5         2.4          3.7         1.0 versicolor
## 83           5.8         2.7          3.9         1.2 versicolor
## 84           6.0         2.7          5.1         1.6 versicolor
## 85           5.4         3.0          4.5         1.5 versicolor
## 86           6.0         3.4          4.5         1.6 versicolor
## 87           6.7         3.1          4.7         1.5 versicolor
## 88           6.3         2.3          4.4         1.3 versicolor
## 89           5.6         3.0          4.1         1.3 versicolor
## 90           5.5         2.5          4.0         1.3 versicolor
## 91           5.5         2.6          4.4         1.2 versicolor
## 92           6.1         3.0          4.6         1.4 versicolor
## 93           5.8         2.6          4.0         1.2 versicolor
## 94           5.0         2.3          3.3         1.0 versicolor
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         2.9          4.3         1.3 versicolor
## 99           5.1         2.5          3.0         1.1 versicolor
## 100          5.7         2.8          4.1         1.3 versicolor
## 101          6.3         3.3          6.0         2.5  virginica
## 102          5.8         2.7          5.1         1.9  virginica
## 103          7.1         3.0          5.9         2.1  virginica
## 104          6.3         2.9          5.6         1.8  virginica
## 105          6.5         3.0          5.8         2.2  virginica
## 106          7.6         3.0          6.6         2.1  virginica
## 107          4.9         2.5          4.5         1.7  virginica
## 108          7.3         2.9          6.3         1.8  virginica
## 109          6.7         2.5          5.8         1.8  virginica
## 110          7.2         3.6          6.1         2.5  virginica
## 111          6.5         3.2          5.1         2.0  virginica
## 112          6.4         2.7          5.3         1.9  virginica
## 113          6.8         3.0          5.5         2.1  virginica
## 114          5.7         2.5          5.0         2.0  virginica
## 115          5.8         2.8          5.1         2.4  virginica
## 116          6.4         3.2          5.3         2.3  virginica
## 117          6.5         3.0          5.5         1.8  virginica
## 118          7.7         3.8          6.7         2.2  virginica
## 119          7.7         2.6          6.9         2.3  virginica
## 120          6.0         2.2          5.0         1.5  virginica
## 121          6.9         3.2          5.7         2.3  virginica
## 122          5.6         2.8          4.9         2.0  virginica
## 123          7.7         2.8          6.7         2.0  virginica
## 124          6.3         2.7          4.9         1.8  virginica
## 125          6.7         3.3          5.7         2.1  virginica
## 126          7.2         3.2          6.0         1.8  virginica
## 127          6.2         2.8          4.8         1.8  virginica
## 128          6.1         3.0          4.9         1.8  virginica
## 129          6.4         2.8          5.6         2.1  virginica
## 130          7.2         3.0          5.8         1.6  virginica
## 131          7.4         2.8          6.1         1.9  virginica
## 132          7.9         3.8          6.4         2.0  virginica
## 133          6.4         2.8          5.6         2.2  virginica
## 134          6.3         2.8          5.1         1.5  virginica
## 135          6.1         2.6          5.6         1.4  virginica
## 136          7.7         3.0          6.1         2.3  virginica
## 137          6.3         3.4          5.6         2.4  virginica
## 138          6.4         3.1          5.5         1.8  virginica
## 139          6.0         3.0          4.8         1.8  virginica
## 140          6.9         3.1          5.4         2.1  virginica
## 141          6.7         3.1          5.6         2.4  virginica
## 142          6.9         3.1          5.1         2.3  virginica
## 143          5.8         2.7          5.1         1.9  virginica
## 144          6.8         3.2          5.9         2.3  virginica
## 145          6.7         3.3          5.7         2.5  virginica
## 146          6.7         3.0          5.2         2.3  virginica
## 147          6.3         2.5          5.0         1.9  virginica
## 148          6.5         3.0          5.2         2.0  virginica
## 149          6.2         3.4          5.4         2.3  virginica
## 150          5.9         3.0          5.1         1.8  virginica
```

a. Check for the structure of the dataset using the str() function. Describe what you have seen in the output.

```r
str(iris)
```

```
## 'data.frame':    150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
##  $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```
The str function tells the structure of the iris data set, that there are 150 objects in
5 variables
```

b. Create an R object that will contain the mean of the sepal.length, sepal.width,petal.length,and petal.width. What is the R script and its result?

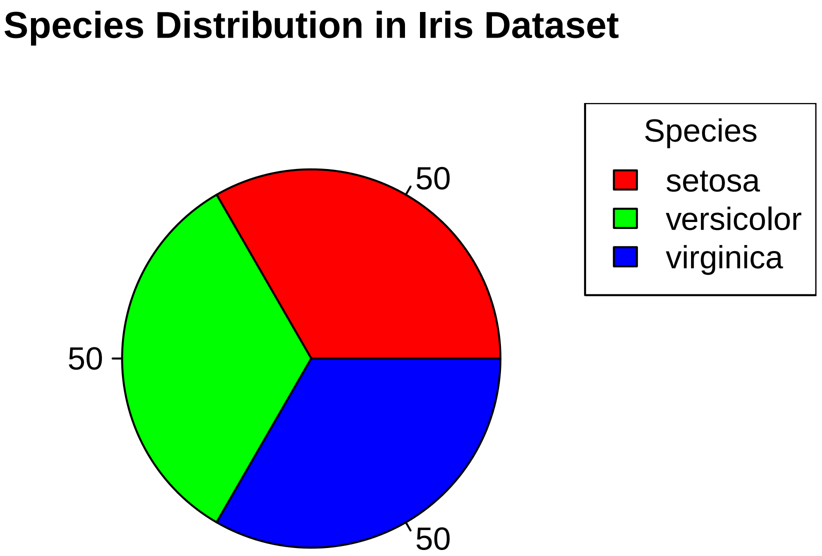
```r
num6b<-mean(iris$Sepal.Length)
num6b
```

```
## [1] 5.843333
```

c. Create a pie chart for the Species distribution. Add title, legends, and colors. Write the R script and its result.

```r
data(iris)

species_counts <- table(iris$Species)

colors <- c("setosa" = "red", "versicolor" = "green", "virginica" = "blue")

pie(species_counts, labels = species_counts, col = colors)
```

```
legend("topright", legend = names(species_counts), fill = colors, title = "Species")

title("Species Distribution in Iris Dataset")
```


Species Distribution in Iris Dataset

d. Subset the species into setosa, versicolor, and virginica. Write the R scripts and show the last six (6) rows of each species.

```
data(iris)

dsetosa<- subset(iris,Species == 'setosa' )
tail(dsetosa)
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 45          5.1         3.8          1.9         0.4  setosa
## 46          4.8         3.0          1.4         0.3  setosa
## 47          5.1         3.8          1.6         0.2  setosa
## 48          4.6         3.2          1.4         0.2  setosa
## 49          5.3         3.7          1.5         0.2  setosa
## 50          5.0         3.3          1.4         0.2  setosa
```

```
dversicolor<-subset(iris,Species == 'versicolor' )
tail(dversicolor)
```

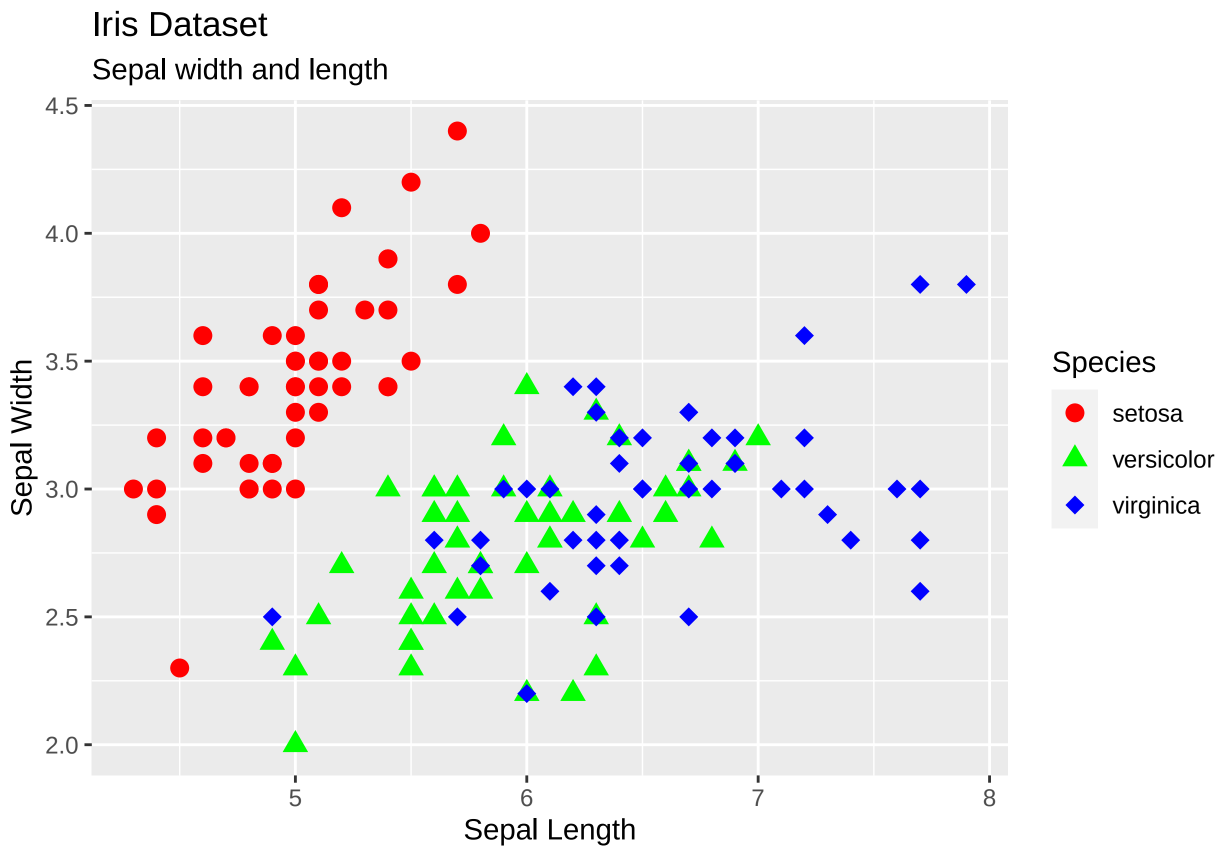
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         2.9          4.3         1.3 versicolor
## 99           5.1         2.5          3.0         1.1 versicolor
## 100          5.7         2.8          4.1         1.3 versicolor
```

```
dvirginica<-subset(iris,Species == 'virginica' )
tail(dvirginica)
```

```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 145          6.7         3.3          5.7         2.5 virginica
## 146          6.7         3.0          5.2         2.3 virginica
## 147          6.3         2.5          5.0         1.9 virginica
## 148          6.5         3.0          5.2         2.0 virginica
## 149          6.2         3.4          5.4         2.3 virginica
## 150          5.9         3.0          5.1         1.8 virginica
```

e. Create a scatterplot of the sepal.length and sepal.width using the different species(setosa,versicolor,virginica). Add a title = “Iris Dataset”, subtitle = “Sepal width and length, labels for the x and y axis, the pch symbol and colors should be based on the species.

```
library(ggplot2)
scatterplot <- ggplot(iris, aes(x = Sepal.Length, y = Sepal.Width, color = Species, shape = Species)) +
  geom_point(size = 3) +
  labs(
    title = "Iris Dataset",
    subtitle = "Sepal width and length",
    x = "Sepal Length",
    y = "Sepal Width"
  ) +
  scale_shape_manual(values = c(16, 17, 18)) +
  scale_color_manual(values = c("setosa" = "red", "versicolor" = "green", "virginica" = "blue"))

scatterplot
```



f. Interpret the result. ‘Setosa have the bigger sepal width and Virginica have the highest sepal length, while the versicolor is in equal in length and in width’

Basic Cleaning and Transformation of Objects

7. Import the alexa-file.xlsx. Check on the variations. Notice that there are extra whitespaces among black variants (Black Dot, Black Plus, Black Show, Black Spot). Also on the white variants (White Dot, White Plus, White Show, White Spot).

```
library(readxl)
alexa_file <- read_excel("alexa_file.xlsx")
```

a. Rename the white and black variants by using gsub() function.

```
alexa_file$variation <- gsub("Black", "black",alexa_file$variation)
alexa_file$variation <- gsub("White", "white",alexa_file$variation)
alexa_file
```

```
## # A tibble: 3,150 x 5
##    rating date                variation          verified_reviews     feedback
##     <dbl> <dttm>              <chr>              <chr>                   <dbl>
##  1      5 2018-07-31 00:00:00 Charcoal Fabric    Love my Echo!               1
##  2      5 2018-07-31 00:00:00 Charcoal Fabric    Loved it!                   1
##  3      4 2018-07-31 00:00:00 Walnut Finish      Sometimes while play~       1
##  4      5 2018-07-31 00:00:00 Charcoal Fabric    I have had a lot of ~       1
##  5      5 2018-07-31 00:00:00 Charcoal Fabric    Music                       1
##  6      5 2018-07-31 00:00:00 Heather Gray Fabric I received the echo ~       1
##  7      3 2018-07-31 00:00:00 Sandstone Fabric   Without having a cel~       1
##  8      5 2018-07-31 00:00:00 Charcoal Fabric    I think this is the ~       1
##  9      5 2018-07-30 00:00:00 Heather Gray Fabric looks great                 1
## 10      5 2018-07-30 00:00:00 Heather Gray Fabric Love it! I've listen~       1
## # i 3,140 more rows
```

Syntax: RObject*columnName* < −*gsub*(”*OldName*”, ”*NewName*”, *RObject*columnName) Write the R scripts and show an example of the output by getting a snippet. To embed an image into Rmd, use the function below: knitr::include_graphics(“file path”) # knitr::include_graphics(“file path”) knitr::include_graphics(“E:/RBasics/R_Directory/CS101(lectures_23)/BasicsOfR/RBasics/notes/images/m2.JPG”)

b. Get the total number of each variations and save it into another object. Save the object as variations.RData. Write the R scripts. What is its result? Hint: Use the dplyr package. Make sure to install it before loading the package. Syntax for dplyr RObject %>% count(RObject$columnName)

```
install.packages("dplyr")
```

```
## Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.3'
## (as 'lib' is unspecified)
```

```
library(readxl)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
alexa_files <- read_excel("alexa_file.xlsx")
variation_counts <-alexa_files %>%
  count(variation)

save(variation_counts, file = "variations.RData")


variation_counts
```

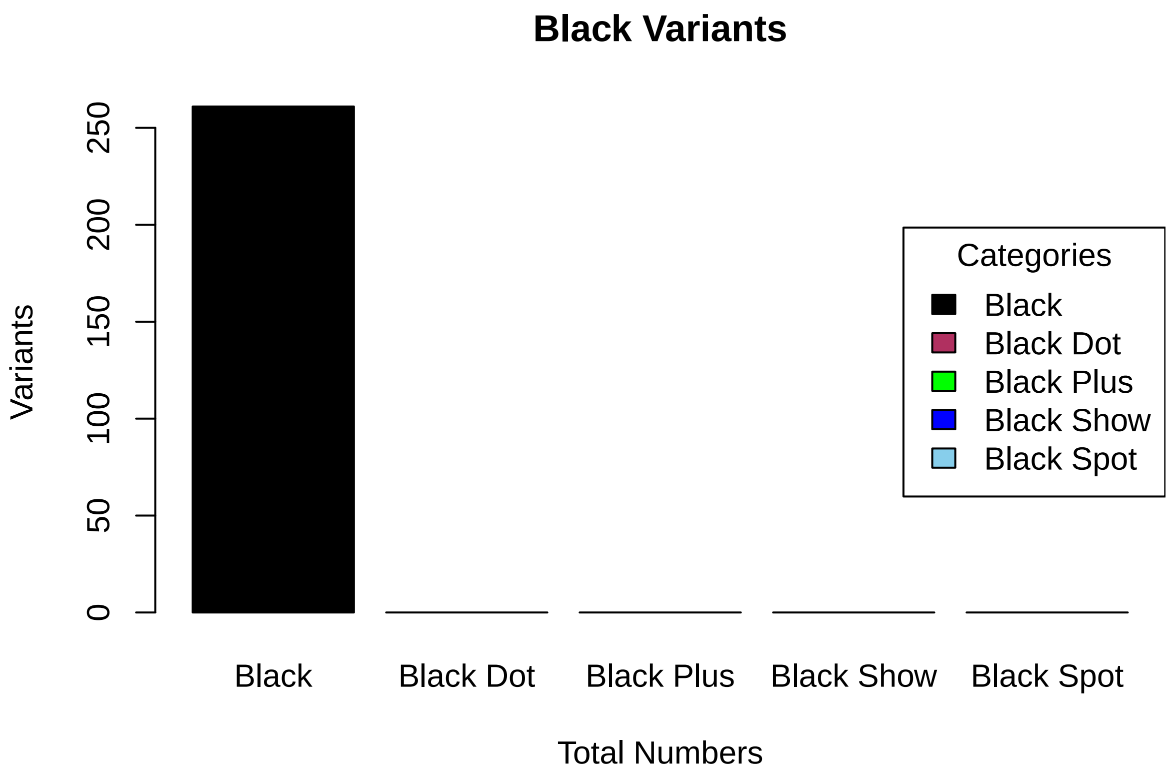
```
## # A tibble: 16 x 2
##    variation                       n
##    <chr>                       <int>
##  1 Black                         261
##  2 Black  Dot                    516
##  3 Black  Plus                   270
##  4 Black  Show                   265
##  5 Black  Spot                   241
##  6 Charcoal Fabric               430
##  7 Configuration: Fire TV Stick  350
##  8 Heather Gray Fabric           157
##  9 Oak Finish                     14
## 10 Sandstone Fabric               90
## 11 Walnut Finish                   9
## 12 White                          91
## 13 White  Dot                    184
## 14 White  Plus                    78
## 15 White  Show                    85
## 16 White  Spot                   109
```

Sample Output c. From the variations.RData, create a barplot(). Complete the details of the chart which include the title, color, labels of each bar.

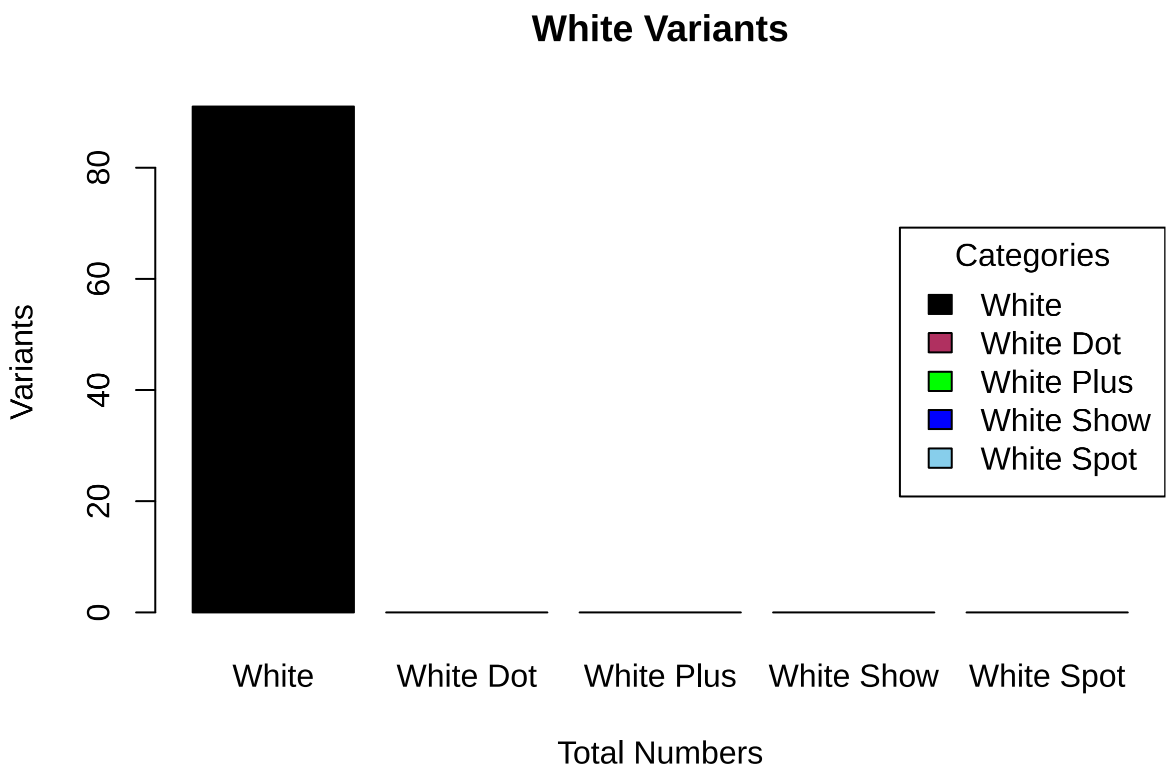
```
library(readr)
load("variations.RData")
```

d. Create a barplot() for the black and white variations. Plot it in 1 frame, side by side. Complete the details of the chart. Example:

```
library(ggplot2)
b1<-subset(alexa_files,variation=="Black")
b2<-subset(alexa_files,variation=="Black Dot")
b3<-subset(alexa_files,variation=="Black Plus")
b4<-subset(alexa_files,variation=="Black Show")
b5<-subset(alexa_files,variation=="Black Spot")
colors<-c("black","maroon","green","blue","skyblue")
barplot(
  c(nrow(b1), nrow(b2), nrow(b3), nrow(b4), nrow(b5)),
  names.arg = c("Black","Black Dot", "Black Plus","Black Show","Black Spot"),
  col = colors,
  main = "Black Variants",
  xlab = "Total Numbers",
  ylab = "Variants"
)

legend("right", legend = c("Black","Black Dot", "Black Plus","Black Show","Black Spot"), fill = colors,
```



```r
library(ggplot2)
b1<-subset(alexa_files,variation=="White")
b2<-subset(alexa_files,variation=="White Dot")
b3<-subset(alexa_files,variation=="White Plus")
b4<-subset(alexa_files,variation=="White Show")
b5<-subset(alexa_files,variation=="White Spot")
colors<-c("black","maroon","green","blue","skyblue")
barplot(
  c(nrow(b1), nrow(b2), nrow(b3), nrow(b4), nrow(b5)),
  names.arg = c("White","White Dot", "White Plus","White Show","White Spot"),
  col = colors,
  main = "White Variants",
  xlab = "Total Numbers",
  ylab = "Variants"
)

legend("right", legend = c("White","White Dot", "White Plus","White Show","White Spot"), fill = colors,
```


White Variants
Variants
0
20
40
60
80
Categories
White
White Dot
White Plus
White Show
White Spot
White
White Dot
White Plus
White Show
White Spot
Total Numbers