RWorksheet_Camarista#4b

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#Using Loop Function ##for() loop 1. 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)
matrixA <- matrix(0, nrow = 5, ncol = 5)

for(i in 1:5){

    matrixA[i, ] <- abs(vectorA - i)
}
matrixA
```

```
##      [,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

```
for(i in 1:5){

    cat(rep("*", i), "\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.

```
#There's an error during knitting in this particular chunk. So I just commented the prompt script an in
#start <- as.integer(readline(prompt = "Enter the starting number: "))
start <- 4
```

```
a <- start
b <- start + 1

cat(a, "\n")
```

```
## 4
```

```
repeat {
  cat(b, "\n")

  next_term <- a + b

  if (next_term > 500) {
    break
  }

  a <- b
  b <- next_term
}
```

```
## 5
## 9
## 14
## 23
## 37
## 60
## 97
## 157
## 254
## 411
```

##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

```
ShoeSize_Data <- read.csv("ShoeSize.csv")
head(ShoeSize_Data)
```

```
##   X Shoe_Size Height gender
## 1 1       6.5   66.0      F
## 2 2       9.0   68.0      F
## 3 3       8.5   64.5      F
## 4 4       8.5   65.0      F
## 5 5      10.5   70.0      M
## 6 6       7.0   64.0      F
```

- b. Create a subset for gender(female and male). How many observations are there in Male? How about in

```
male_sub <- subset(ShoeSize_Data, gender == "M", select = gender)
male_count <- nrow(male_sub)
print(paste("There are", male_count, "males"))
```

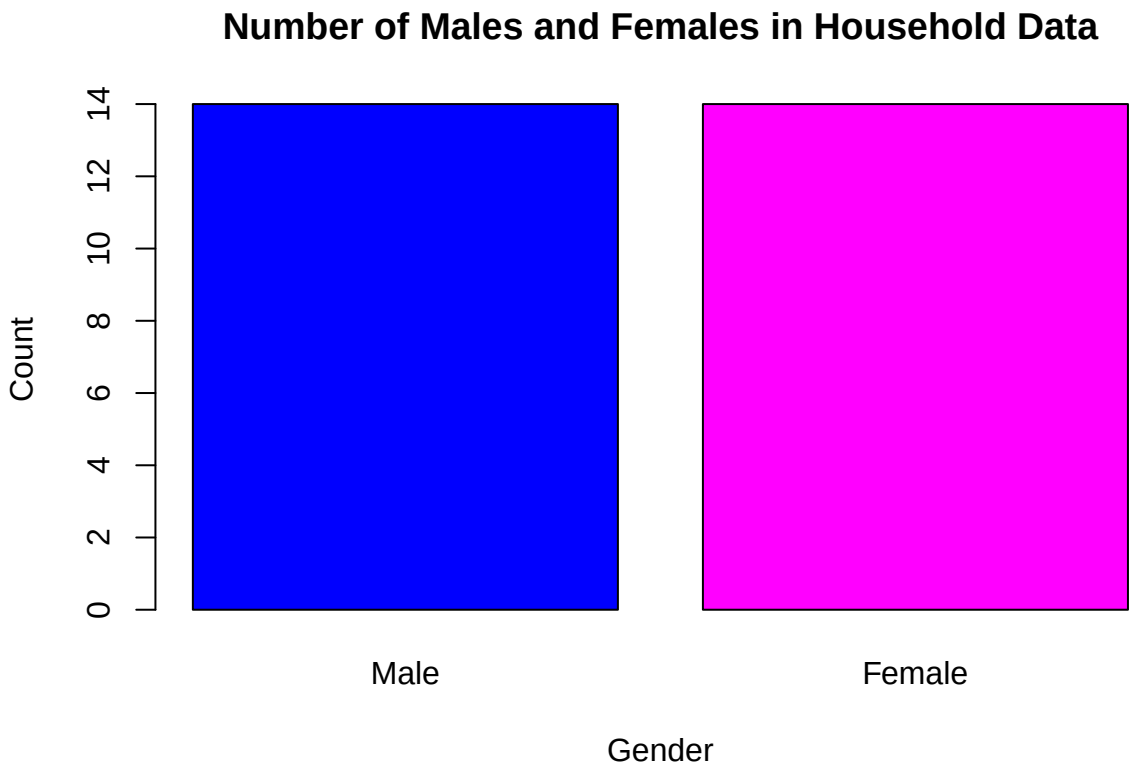
```
## [1] "There are 14 males"
```

```
female_sub <- subset(ShoeSize_Data, gender == "F", select = gender)
female_count <- nrow(female_sub)
print(paste("There are", female_count, "females"))
```

```
## [1] "There are 14 females"
```

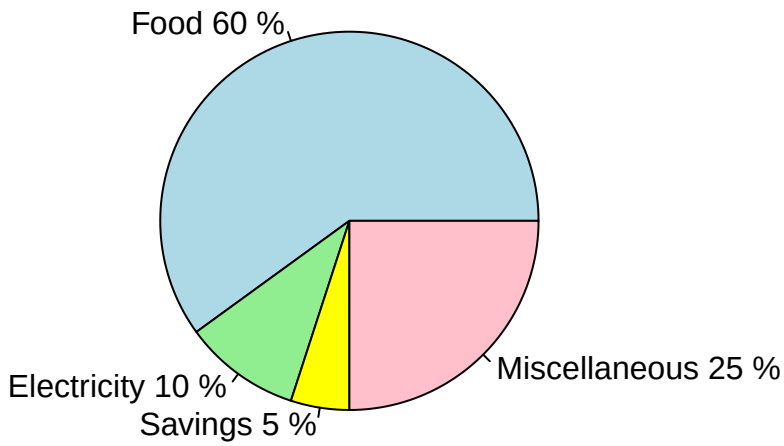
- c.Create a graph for the number of males and females for Household Data. Use plot(), chart type = bar

```
gender_counts <- c(male_count, female_count)
gender_labels <- c("Male", "Female")
barplot(
  gender_counts,
  names.arg = gender_labels,
  main = "Number of Males and Females in Household Data",
  xlab = "Gender",
  ylab = "Count",
  col = c("blue", "#FF00FF")
)
```



##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
expenses <- c(Food = 60, Electricity = 10, Savings = 5, Miscellaneous = 25)

percent_labels <- paste(names(expenses), round(expenses / sum(expenses) * 100, 1), "%")

pie(
  expenses,
  labels = percent_labels,
  main = "Monthly Expenditure of Dela Cruz Family",
  col = c("lightblue", "lightgreen", "yellow", "pink")
)
```



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

```r
# Load the iris dataset
data(iris)

# Check the structure of the dataset
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 ...
```

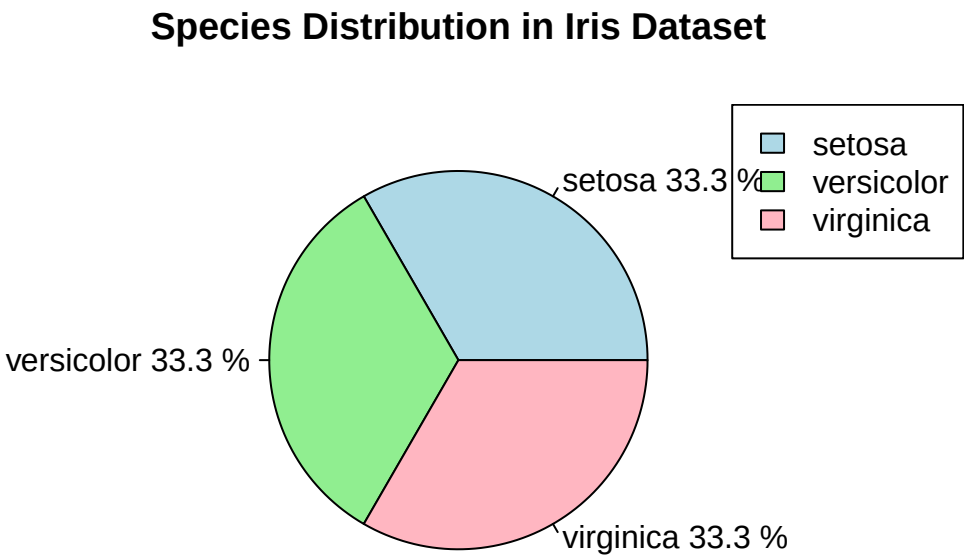
- b. Create an R object that will contain the mean of the sepal.length, sepal.width,petal.length,and petal.width. What is the R script and its result?

```
irisMean <- colMeans(iris[, 1:4])
irisMean
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##     5.843333     3.057333     3.758000     1.199333
```

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

```
species_counts <- table(iris$Species)

pie(
  species_counts,
  labels = paste(names(species_counts), round(species_counts / sum(species_counts) * 100, 1), "%"),
  main = "Species Distribution in Iris Dataset",
  col = c("lightblue", "lightgreen", "lightpink")
)

legend("topright", legend = names(species_counts), fill = c("lightblue", "lightgreen", "lightpink"))
```



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

```r
setosa <- subset(iris, Species == "setosa")
versicolor <- subset(iris, Species == "versicolor")
virginica <- subset(iris, Species == "virginica")

tail(setosa)
```

```
##    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
```

```r
tail(versicolor)
```

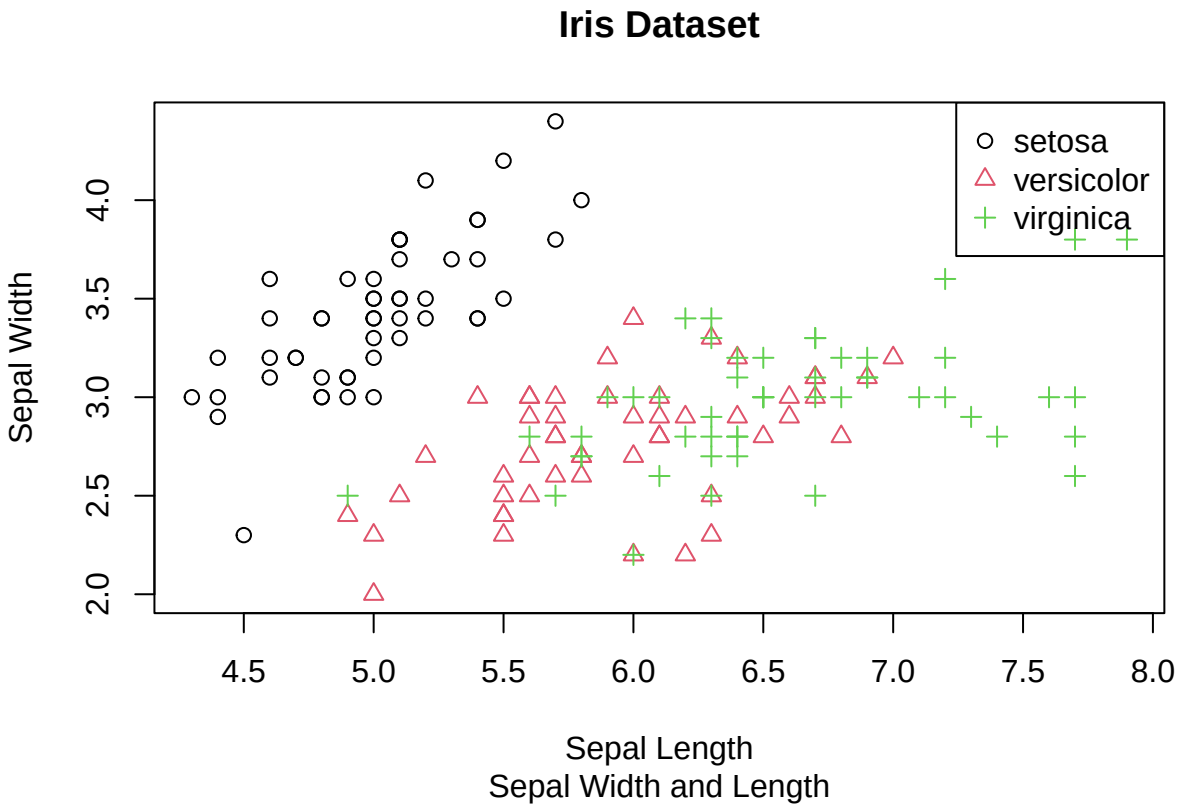
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         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
```

```r
tail(virginica)
```

```
##     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. Hint: Need to convert to factors the species to store categorical variables.

```r
plot(
  iris$Sepal.Length, iris$Sepal.Width,
  col = as.numeric(iris$Species),
  pch = as.numeric(iris$Species),
  main = "Iris Dataset",
  sub = "Sepal Width and Length",
  xlab = "Sepal Length",
  ylab = "Sepal Width"
)

legend("topright", legend = levels(iris$Species), col = 1:3, pch = 1:3)
```



- f. Interpret the result

The Setosa species' sepal width has a relation to its sepal length. The longer the length, the wider it's width. While the Versicolor and Virginica species tend to overlap in the middle. The longer their length, their width almost stays the same arounf 3.0.

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

```
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_data <- read_excel("E:/Github/Data Science Worksheets/DataScience_Worksheets_Camarista/Worksheet#4
head(alexa_data)
```

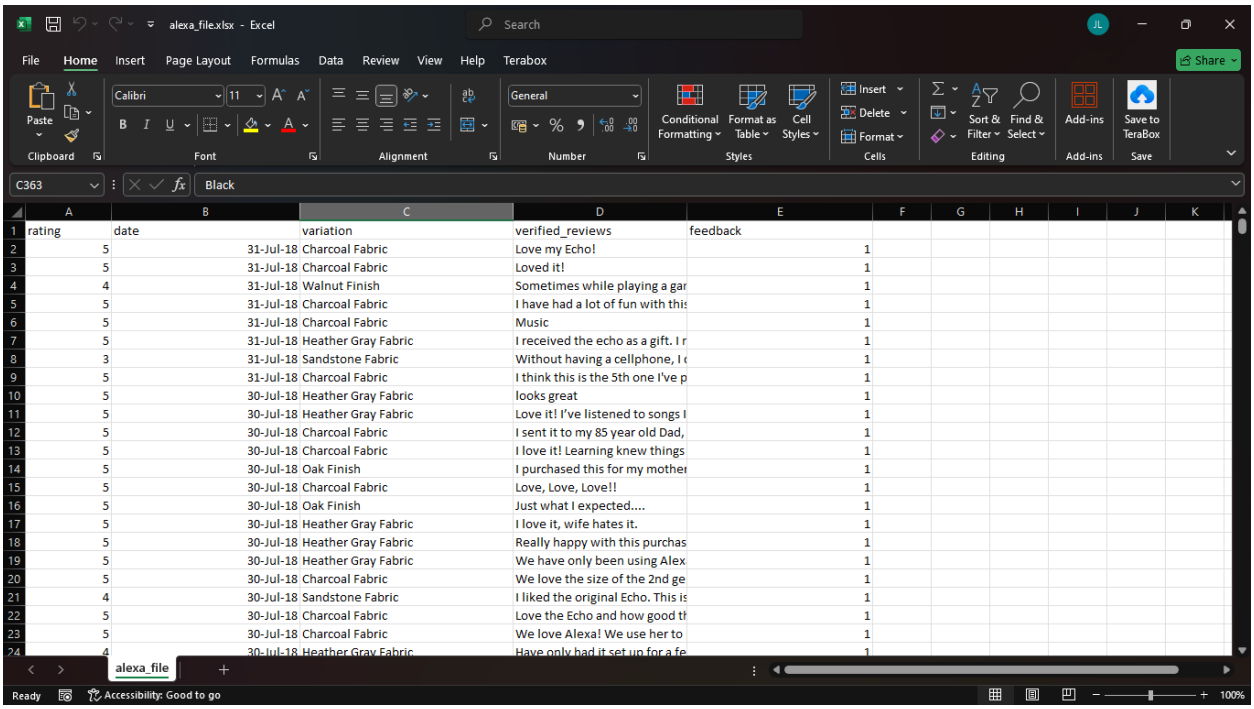
```
## # A tibble: 6 x 5
##   rating date                variation           verified_reviews       feedback
##    <dbl> <dttm>              <chr>               <chr>                     <dbl>
## 1      5 2018-07-31 00:00:00 Charcoal Fabric     Love my Echo!                 1
## 2      5 2018-07-31 00:00:00 Charcoal Fabric     Loved it!                     1
## 3      4 2018-07-31 00:00:00 Walnut Finish       Sometimes while playi~        1
## 4      5 2018-07-31 00:00:00 Charcoal Fabric     I have had a lot of f~        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 a~        1
```

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")

```
alexa_data$variation <- trimws(alexa_data$variation)


  alexa_data$variation <- gsub("Black[[:space:]]+", "Black ", alexa_data$variation)
  alexa_data$variation <- gsub("White[[:space:]]+", "White ", alexa_data$variation)

head(alexa_data)
```

```
## # A tibble: 6 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 playi~        1
## 4      5 2018-07-31 00:00:00 Charcoal Fabric     I have had a lot of f~        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 a~        1
```

```
knitr::include_graphics("E:/Github/Data Science Worksheets/DataScience_Worksheets_Camarista/Worksheet#4/
```



	A	B	C	D	E	F	G	H	I	J	K
1	rating	date	variation	verified_reviews	feedback						
2	5	31-Jul-18	Charcoal Fabric	Love my Echo!	1						
3	5	31-Jul-18	Charcoal Fabric	Loved it!	1						
4	4	31-Jul-18	Walnut Finish	Sometimes while playing a gar	1						
5	5	31-Jul-18	Charcoal Fabric	I have had a lot of fun with this	1						
6	5	31-Jul-18	Charcoal Fabric	Music	1						
7	5	31-Jul-18	Heather Gray Fabric	I received the echo as a gift. I r	1						
8	3	31-Jul-18	Sandstone Fabric	Without having a cellphone, I c	1						
9	5	31-Jul-18	Charcoal Fabric	I think this is the 5th one I've p	1						
10	5	30-Jul-18	Heather Gray Fabric	looks great	1						
11	5	30-Jul-18	Heather Gray Fabric	Love it! I've listened to songs l	1						
12	5	30-Jul-18	Charcoal Fabric	I sent it to my 85 year old Dad,	1						
13	5	30-Jul-18	Charcoal Fabric	I love it! Learning knew things	1						
14	5	30-Jul-18	Oak Finish	I purchased this for my mother	1						
15	5	30-Jul-18	Charcoal Fabric	Love, Love, Love!!	1						
16	5	30-Jul-18	Oak Finish	Just what I expected....	1						
17	5	30-Jul-18	Heather Gray Fabric	I love it, wife hates it.	1						
18	5	30-Jul-18	Heather Gray Fabric	Really happy with this purchas	1						
19	5	30-Jul-18	Heather Gray Fabric	We have only been using Alex	1						
20	5	30-Jul-18	Charcoal Fabric	We love the size of the 2nd ge	1						
21	4	30-Jul-18	Sandstone Fabric	I liked the original Echo. This is	1						
22	5	30-Jul-18	Charcoal Fabric	Love the Echo and how good th	1						
23	5	30-Jul-18	Charcoal Fabric	We love Alexa! We use her to	1						
24	4	30-Jul-18	Heather Gray Fabric	Have only had it set up for a fe	1						

- 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)

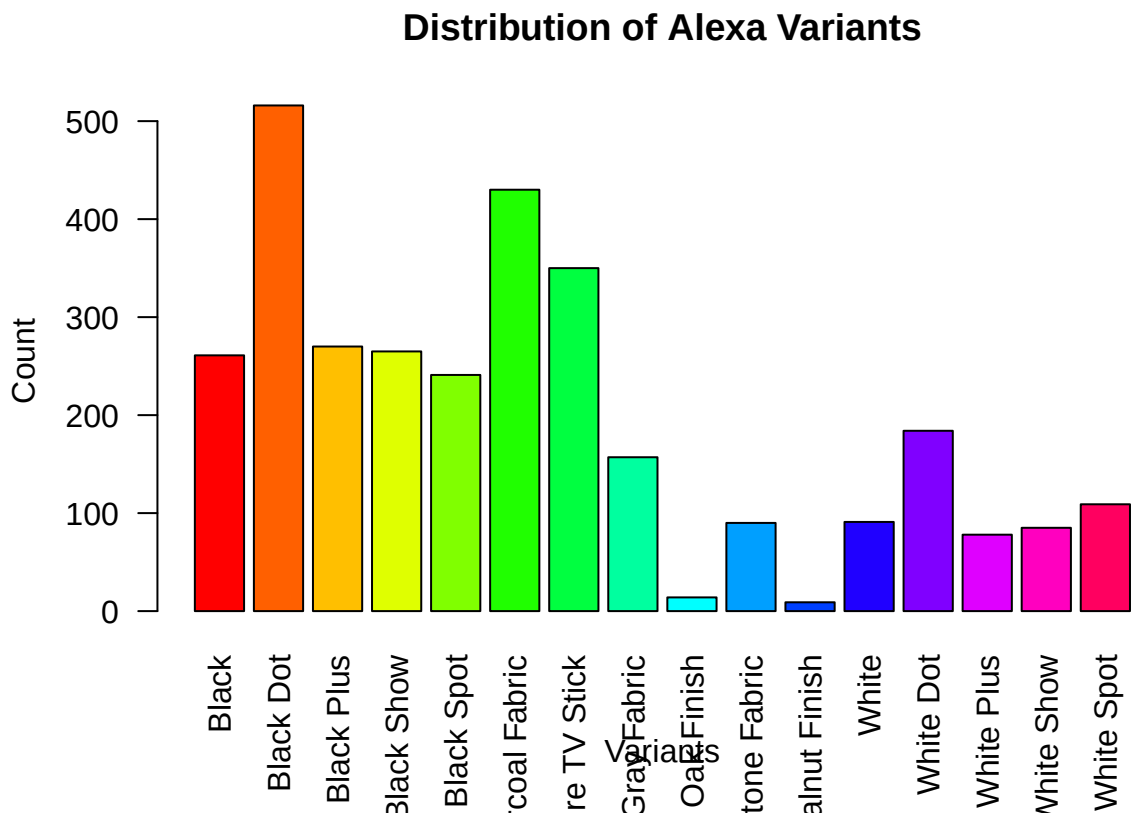
```
variant_counts <- alexa_data %>%
  count(variation)

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

print(variant_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.

```
load("variations.RData")

barplot(
  variant_counts$n,
  names.arg = variant_counts$variation,
  main = "Distribution of Alexa Variants",
  xlab = "Variants",
  ylab = "Count",
  col = rainbow(length(variant_counts$variation)),
  las = 2
)
```



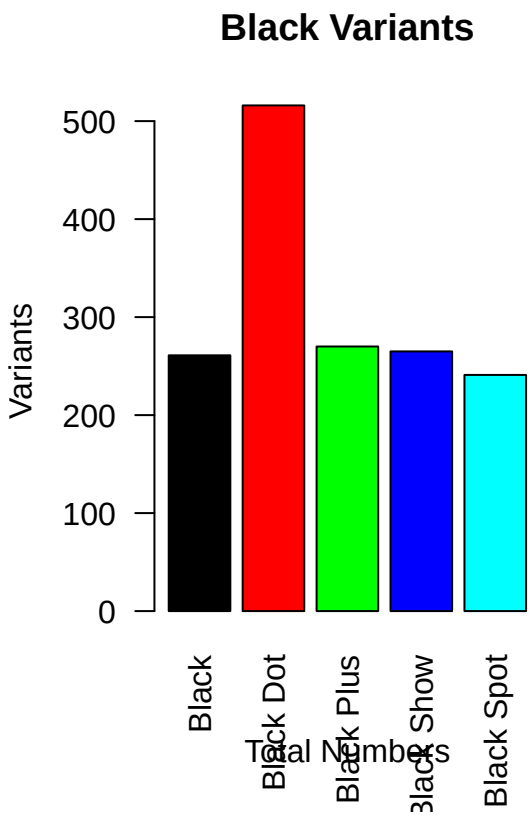

```
print(unique(alexa_data$variant))
```

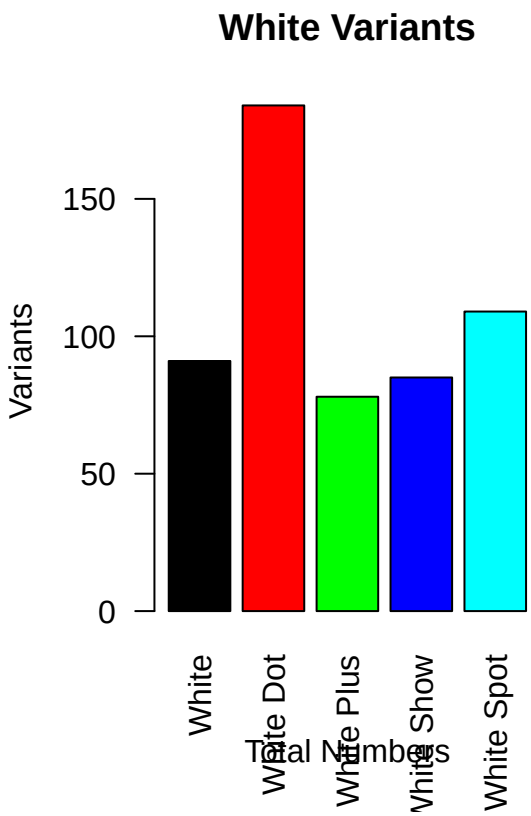
```
## Warning: Unknown or uninitialised column: 'variant'.
```

```
## NULL
```

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

```r
black_variants <- variant_counts %>%
  filter(grepl("Black", variation))

white_variants <- variant_counts %>%
  filter(grepl("White", variation))

par(mfrow = c(1, 2))

barplot(
  black_variants$n,
  names.arg = black_variants$variation,
  main = "Black Variants",
  xlab = "Total Numbers",
  ylab = "Variants",
  col = c("black", "red", "green", "blue", "cyan"),
  las = 2
)

barplot(
  white_variants$n,
  names.arg = white_variants$variation,
  main = "White Variants",
  xlab = "Total Numbers",
  ylab = "Variants",
  col = c("black", "red", "green", "blue", "cyan"),
  las = 2
)
```






```
par(mfrow = c(1, 1))
```