RWorksheet_Gagante#4b.Rmd

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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

```r
vectorA <- c(1, 2, 3, 4, 5)
matrix5 <- matrix( nrow = 5, ncol = 5)

for (i in 1:5) {
  for (j in 1:5) {
    matrix5[i, j] <- abs(i - j)
  }
}

print(matrix5)
```

```
##      [,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

```r
for (i in 1:5) {
  line <- rep('"*"', i)
  cat(line, sep = " ")
  cat("\n")
}
```

```
## "*"
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```

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.

```r
# start <- as.integer(readline(prompt = "Enter the starting number: "))
start <- 1
a <- start
b <- 1
cat(a, b, sep = " ")
```

```
## 1 1
```

```
repeat {
  next_term <- a + b
  if (!is.na(next_term) && next_term > 500) {
    break
  }
 cat(next_term, " ")
  a <- b
  b <- next_term
  }
```

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

```
cat("\n")
```

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.

```
data <- read.csv("Shoe_sizes.csv")

head(data)
```

```
##   Show.Size Height Gender
## 1       6.5   66.0      F
## 2       9.0   68.0      F
## 3       8.5   64.5      F
## 4       8.5   65.0      F
## 5      10.5   70.0      M
## 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 Female? Write the R scripts and its output.

```
male_data <- subset(data, Gender == "M")
female_data <- subset(data, Gender == "F")

num_males <- nrow(male_data)
num_females <- nrow(female_data)

num_males
```

```
## [1] 14
```

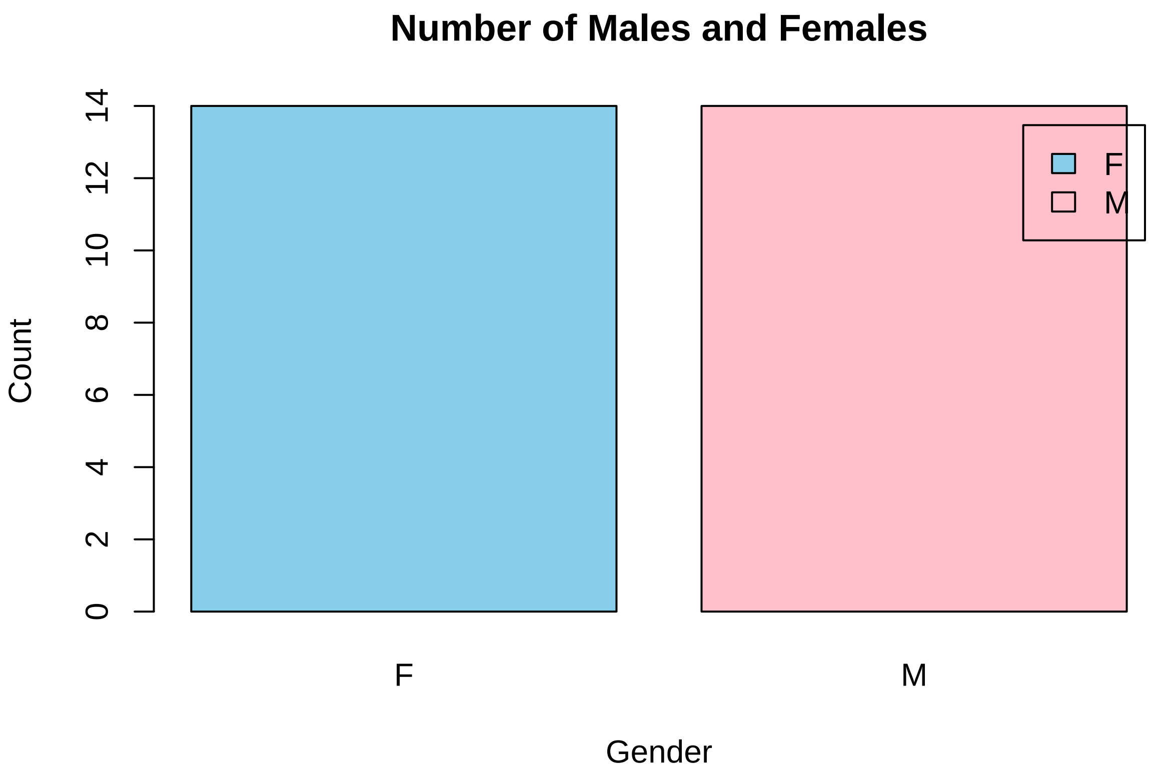
```
num_females
```

```
## [1] 14
```

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.

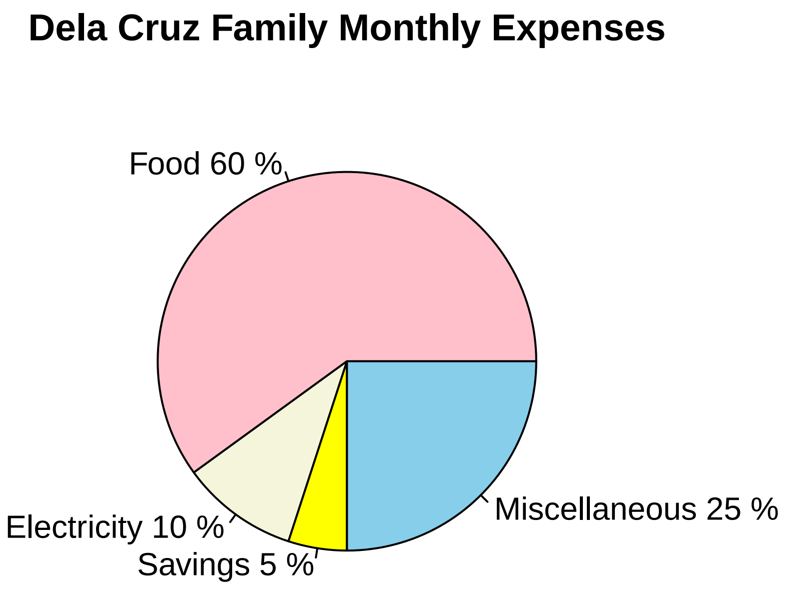
```
gender_counts <- table(data$Gender)

barplot(gender_counts,
        main = "Number of Males and Females",
        xlab = "Gender",
        ylab = "Count",
        col = c("skyblue", "pink"),
        legend = rownames(gender_counts))
```



5. The monthly income of Dela Cruz family was spent on the following: Food Electricity Savings Miscellaneous 60 10 5 25 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)
percentages <- round(expenses / sum(expenses) * 100)
labels <- paste(names(expenses), percentages, "%")
colors <- c("pink", "beige", "yellow", "skyblue")
pie(expenses,
    labels = labels,
    col = colors,
    main = "Dela Cruz Family Monthly Expenses")
```



6. Use the iris dataset. data(iris) a.

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

```r
data(iris)

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 ...
```

#It will show that iris is a data frame with 150 observations and 5 variables: Sepal.Length: Numeric, lengths of sepals (in cm). Sepal.Width: Numeric, widths of sepals (in cm). Petal.Length: Numeric, lengths of petals (in cm). Petal.Width: Numeric, widths of petals (in cm). Species: Factor with 3 levels - setosa, versicolor, virginica. This gives us an idea of what data types are present in each column and how many levels the Species factor has.

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
means <- colMeans(subset(iris, select = -Species))
means
```

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

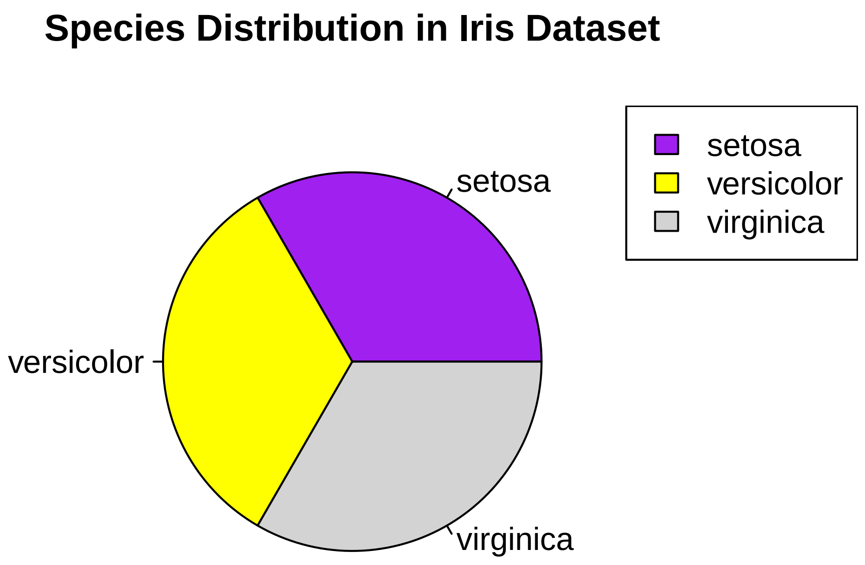
c. Create a pie chart for the Species distribution. Add title, legends, and colors. Write the R script and its result.

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

colors <- c("purple", "yellow", "lightgray")

pie(species_counts,
    main = "Species Distribution in Iris Dataset",
    col = colors,
    labels = names(species_counts))


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



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

```
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
```

```
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
```

```
tail(virginica)
```

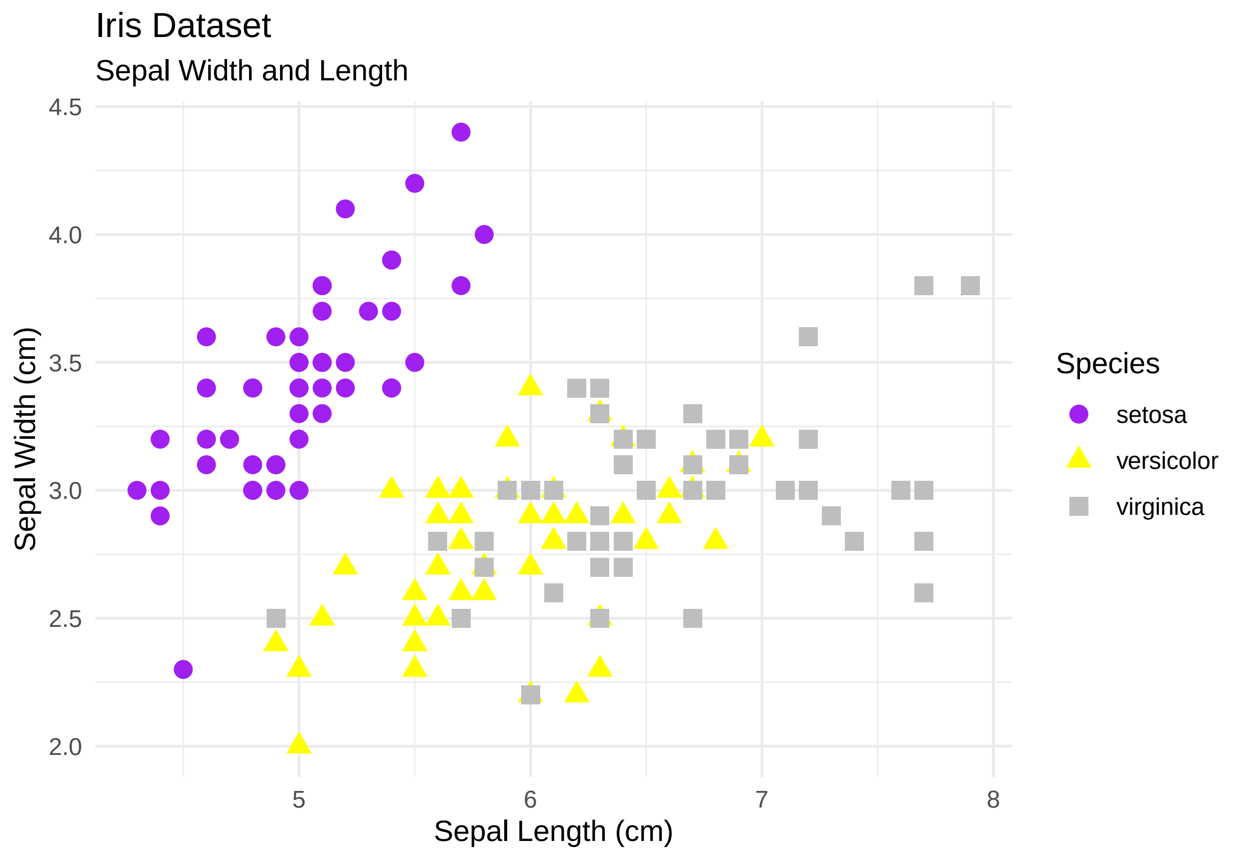
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 145          6.7         3.3          5.7         2.5 virginica
## 146          6.7         3.0          5.2         2.3 virginica
## 147          6.3         2.5          5.0         1.9 virginica
## 148          6.5         3.0          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
library(ggplot2)

ggplot(data = 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 (cm)",
    y = "Sepal Width (cm)"
  ) +
  theme_minimal() +
  scale_color_manual(values = c("setosa" = "purple", "versicolor" = "yellow", "virginica" = "gray"))
```



f. Interpret the result. #The scatter plot of Sepal.Length vs. Sepal.Width shows the relationship between these two measurements for each species:

#Setosa: Typically has higher sepal lengths and widths, clustering separately from the other two species.

#Versicolor and Virginica: Overlap more in their sepal dimensions, but Virginica generally has the largest sepal dimensions.

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).

```r
library(readxl)

alexa_data <- read_excel("alexa_file.xlsx")

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
```

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

```r
alexa_data$variation <- gsub("Black  Dot", "BlackDot", alexa_data$variation)
alexa_data$variation <- gsub("Black  Plus", "BlackPlus", alexa_data$variation)
alexa_data$variation <- gsub("Black  Show", "BlackShow", alexa_data$variation)
alexa_data$variation <- gsub("Black  Spot", "BlackSpot", alexa_data$variation)

# Fix "White" variants
alexa_data$variation <- gsub("White  Dot", "WhiteDot", alexa_data$variation)
alexa_data$variation <- gsub("White  Plus", "WhitePlus", alexa_data$variation)
alexa_data$variation <- gsub("White  Show", "WhiteShow", alexa_data$variation)
alexa_data$variation <- gsub("White  Spot", "WhiteSpot", alexa_data$variation)

alexa_data$variation[1052:2000]
```

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##   [1] "WhiteSpot" "BlackSpot" "BlackSpot" "BlackSpot" "BlackSpot" "WhiteSpot"
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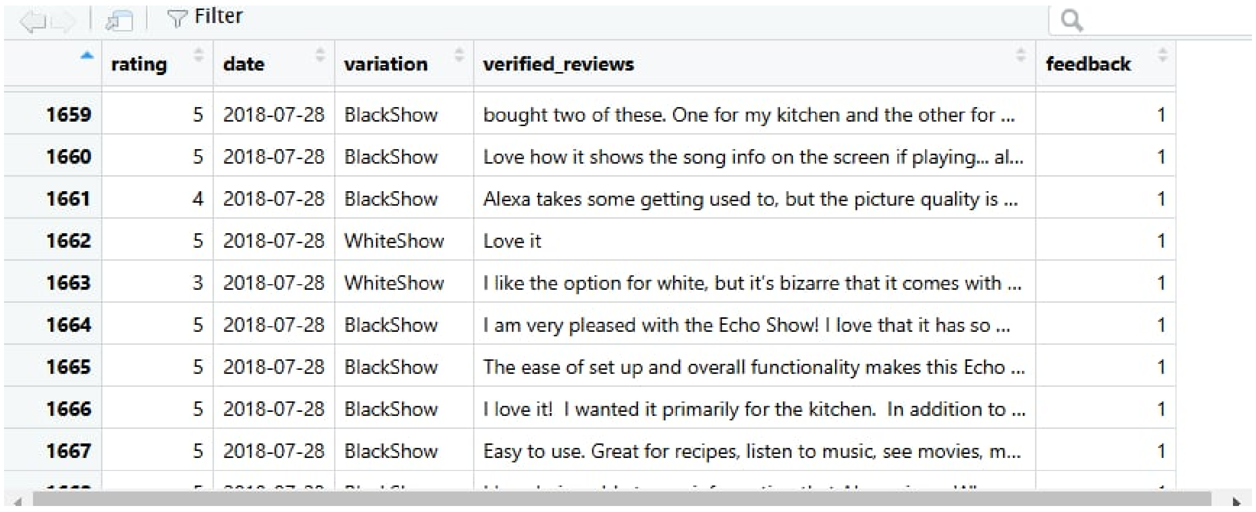
## [835] "BlackPlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [841] "WhitePlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [847] "BlackPlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [853] "WhitePlus" "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [859] "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [865] "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [871] "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [877] "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus"
## [883] "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus" "WhitePlus"
## [889] "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus" "WhitePlus"
## [895] "BlackPlus" "WhitePlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [901] "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [907] "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [913] "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus"
## [919] "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [925] "BlackPlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [931] "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [937] "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [943] "WhitePlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [949] "BlackPlus"
```

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:

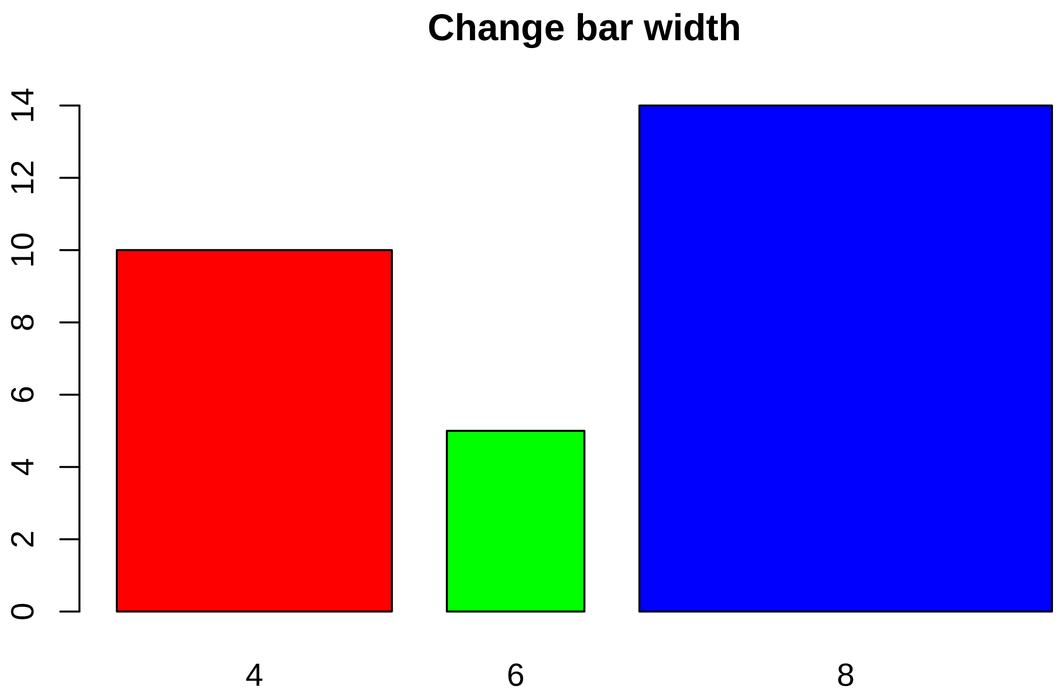
```r
library(knitr)

knitr::include_graphics("alexa_file.png")
```



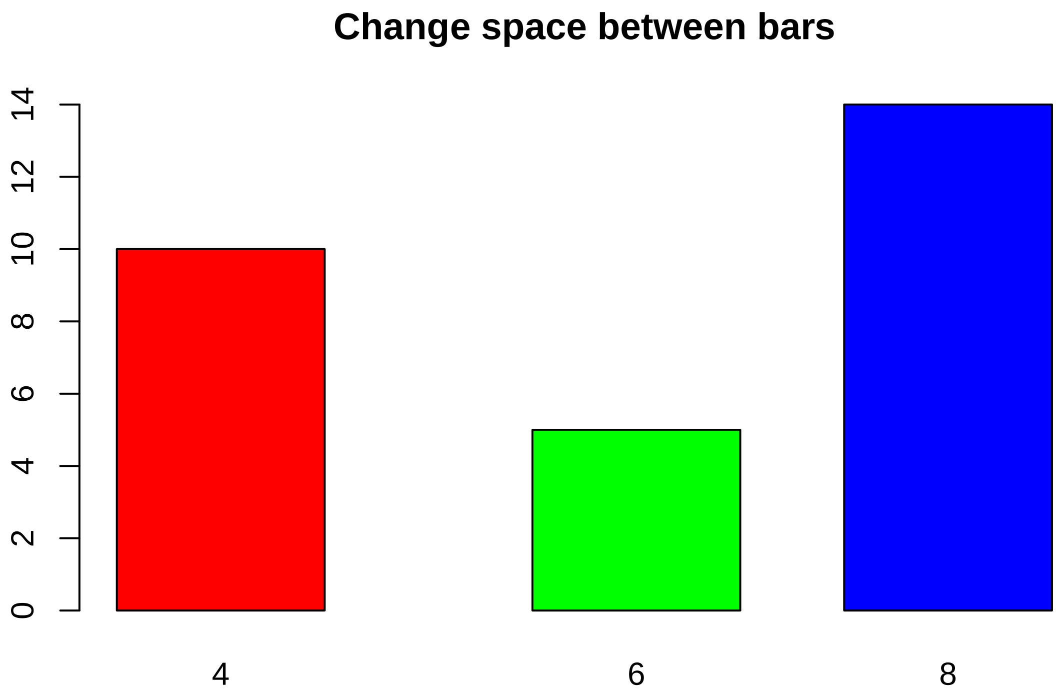
	rating	date	variation	verified_reviews	feedback
1659	5	2018-07-28	BlackShow	bought two of these. One for my kitchen and the other for ...	1
1660	5	2018-07-28	BlackShow	Love how it shows the song info on the screen if playing... al...	1
1661	4	2018-07-28	BlackShow	Alexa takes some getting used to, but the picture quality is ...	1
1662	5	2018-07-28	WhiteShow	Love it	1
1663	3	2018-07-28	WhiteShow	I like the option for white, but it's bizarre that it comes with ...	1
1664	5	2018-07-28	BlackShow	I am very pleased with the Echo Show! I love that it has so ...	1
1665	5	2018-07-28	BlackShow	The ease of set up and overall functionality makes this Echo ...	1
1666	5	2018-07-28	BlackShow	I love it! I wanted it primarily for the kitchen. In addition to ...	1
1667	5	2018-07-28	BlackShow	Easy to use. Great for recipes, listen to music, see movies, m...	1

```r
values <- c(10, 5, 14)
names <- c(4, 6, 8)
colors <- c("red", "green", "blue")
```

```r
barplot(values, names.arg=names, col=colors, main="Change bar width", width=c(1, 0.5, 1.5))
```



```r
barplot(values, names.arg=names, col=colors, main="Change space between bars", space=c(0.2, 1, 0.5))
```



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.

```r
library(dplyr)
```

```
##
```

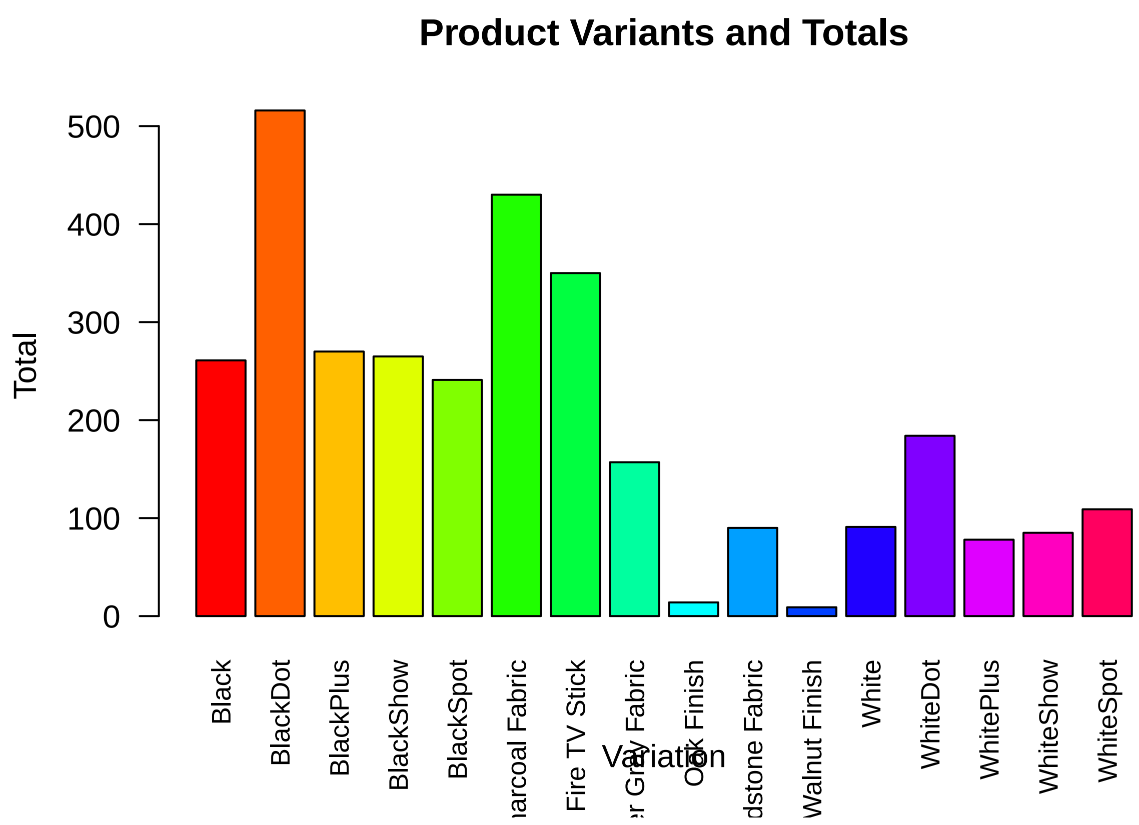
```
## Attaching package: 'dplyr'

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

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

```r
variation_counts <- alexa_data %>%
  count(variation)

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

print(variation_counts)
```

```
## # A tibble: 16 x 2
##    variation                        n
##    <chr>                        <int>
##  1 Black                          261
##  2 BlackDot                       516
##  3 BlackPlus                      270
##  4 BlackShow                      265
##  5 BlackSpot                      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 WhiteDot                       184
## 14 WhitePlus                       78
## 15 WhiteShow                       85
## 16 WhiteSpot                      109
```

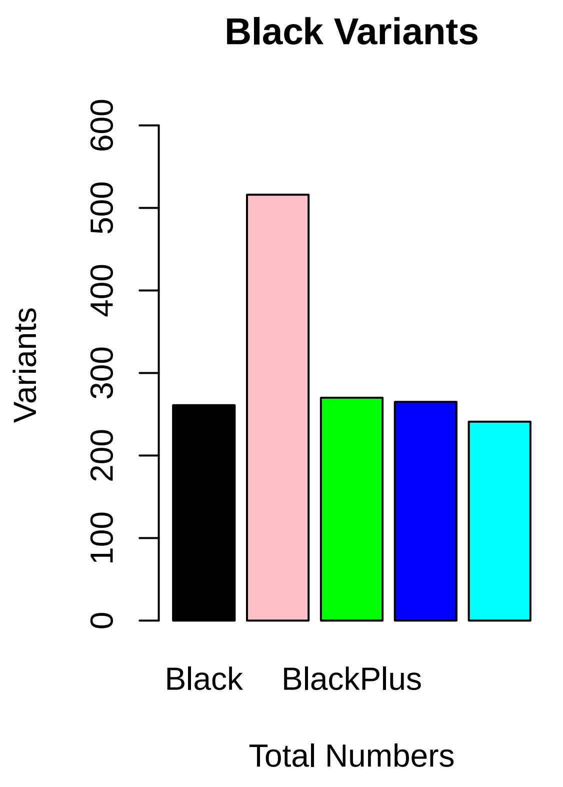
c. From the variations.RData, create a barplot(). Complete the details of the chart which include the title, color, labels of each bar.

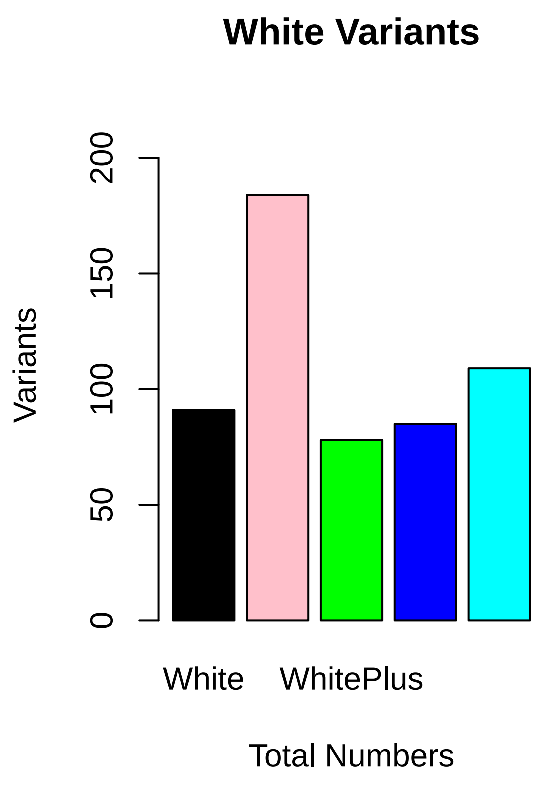
```r
barplot(
  variation_counts$n,
  names.arg = variation_counts$variation,
  col = rainbow(length(variation_counts$variation)),
  main = "Product Variants and Totals",
  xlab = "Variation",
  ylab = "Total",
   las = 2,
   cex.names = 0.8
)
```



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
library(dplyr)

variation_counts <- alexa_data %>%
  filter(grepl("Black|White", variation)) %>% # Filter for Black and White variations
  count(variation)

black_counts <- variation_counts %>%
  filter(grepl("Black", variation))
white_counts <- variation_counts %>%
  filter(grepl("White", variation))

par(mfrow = c(1, 2))

variations <- variation_counts$variation
counts <- variation_counts$n

barplot(black_counts$n,
        names.arg = black_counts$variation,
        col = c("black", "pink", "green", "blue", "cyan"),
        main = "Black Variants",
        xlab = "Total Numbers",
        ylab = "Variants",
        ylim = c(0, max(black_counts$n) * 1.2))

barplot(white_counts$n,
        names.arg = white_counts$variation,
        col = c("black", "pink", "green", "blue", "cyan"),
        main = "White Variants",
        xlab = "Total Numbers",
        ylab = "Variants",
        ylim = c(0, max(white_counts$n) * 1.2))
```


Black Variants
Variants
Black
BlackPlus
Total Numbers


White Variants
Variants
White
WhitePlus
Total Numbers