RWorksheet_Malayas#4b.Rmd

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2024-10-30

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)
matrixT <- matrix(0, nrow = 5, ncol = 5)
for (i in 1:5) {
  matrixT[i, i] <- vectorA[i]
}
matrixT
```

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

2. Print the string "*" using for() function.

```
n <- 5
for (i in 1:n) {
  for (j in 1:i) {
    cat(" *  ")
  }
  cat("\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.

```
start <- as.integer(readline(prompt = "Enter the starting number: "))
```

```
## Enter the starting number:
```

```
start <- 1
a <- start
b <- 1
cat(a, b, sep = " ")
```

```
## 1 1
```

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

```
## 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.

```
shoes <- read.csv("shoes.csv")
```

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

```
head(shoes)
```

```
##   Shoesize 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.

```
female_subset <- subset(shoes, Gender == "F")
male_subset <- subset(shoes, Gender == "M")

female_num <- nrow(female_subset)
male_num <- nrow(male_subset)

cat("Female:", female_num, "\n")
```

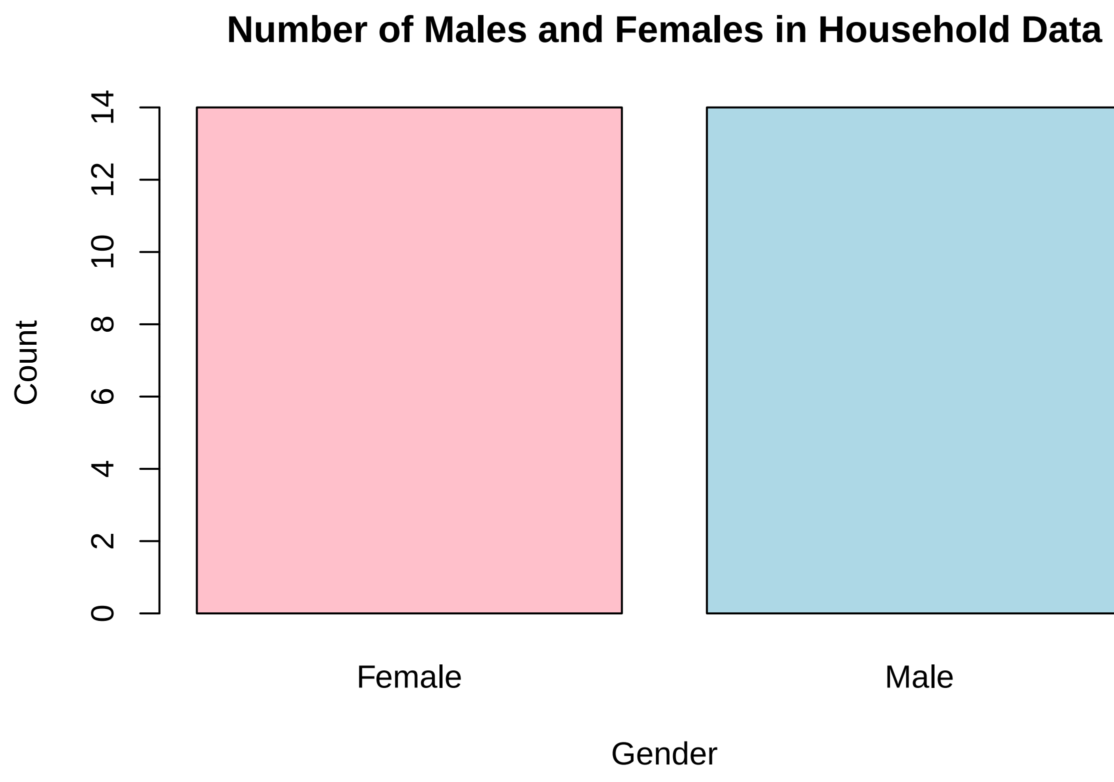
```
## Female: 14
```

```r
cat("Male:", male_num, "\n")
```

```
## Male: 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.

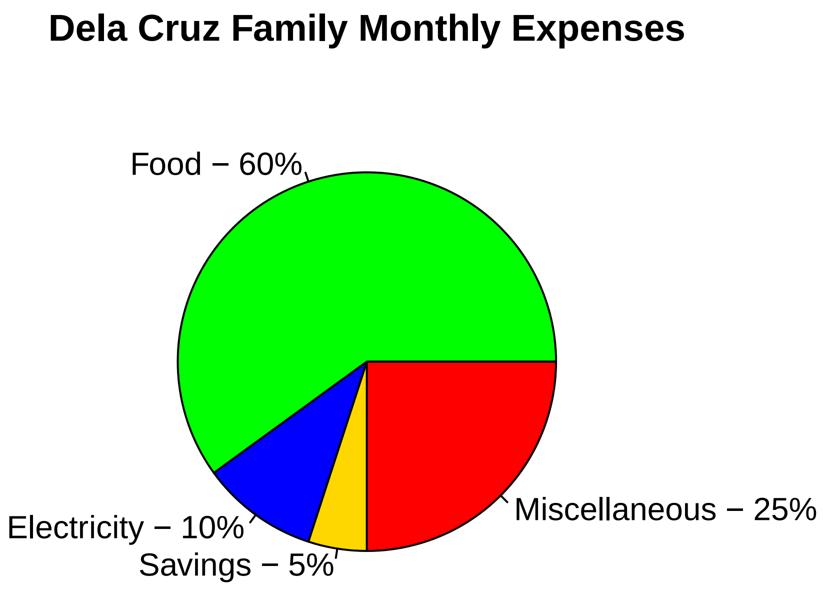
```r
gender_counts <- table(shoes$Gender)
barplot(gender_counts,
        main = "Number of Males and Females in Household Data",
        xlab = "Gender",
        ylab = "Count",
        col = c("pink", "lightblue"),

        names.arg = c("Female", "Male"))
```



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 <- paste0(names(expenses), " - ", round(expenses / sum(expenses) * 100), "%")
pie(expenses,
    labels = percent_labels,
    col = c("green", "blue", "gold", "red"),
    main = "Dela Cruz Family Monthly Expenses")
```



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
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 ...
```

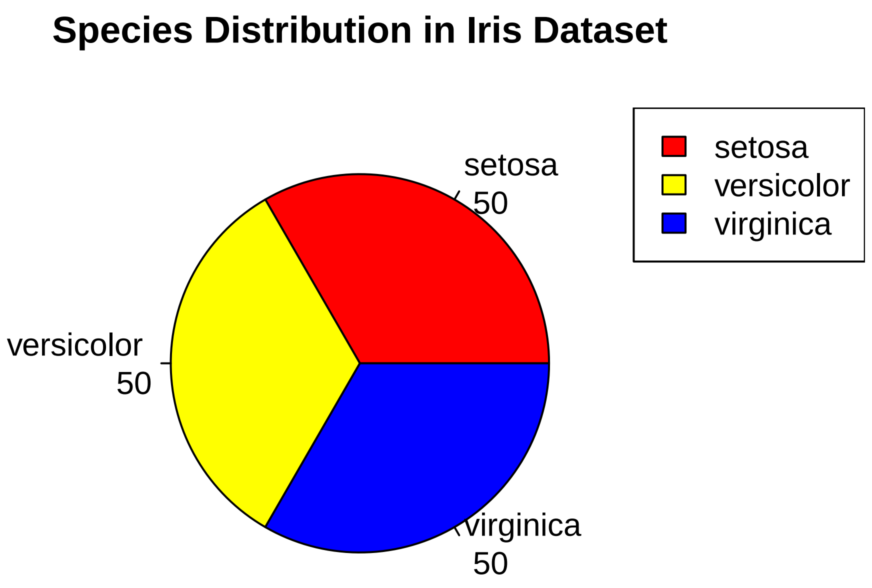
b. Create an R object that will contain the mean of the sepal.length, sepal.width,petal.length,and petal.width. What is the R script and its result?

```r
colMeans(iris[, 1:4])
```

```
## 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)
pie(species_counts,
    main = "Species Distribution in Iris Dataset",
    col = c("red", "yellow", "blue"),
    labels = paste(names(species_counts), "\n", species_counts))
legend("topright",
       legend = names(species_counts),
       fill = c("red", "yellow", "blue"))
```



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
```

```
tail(versicolor)
```

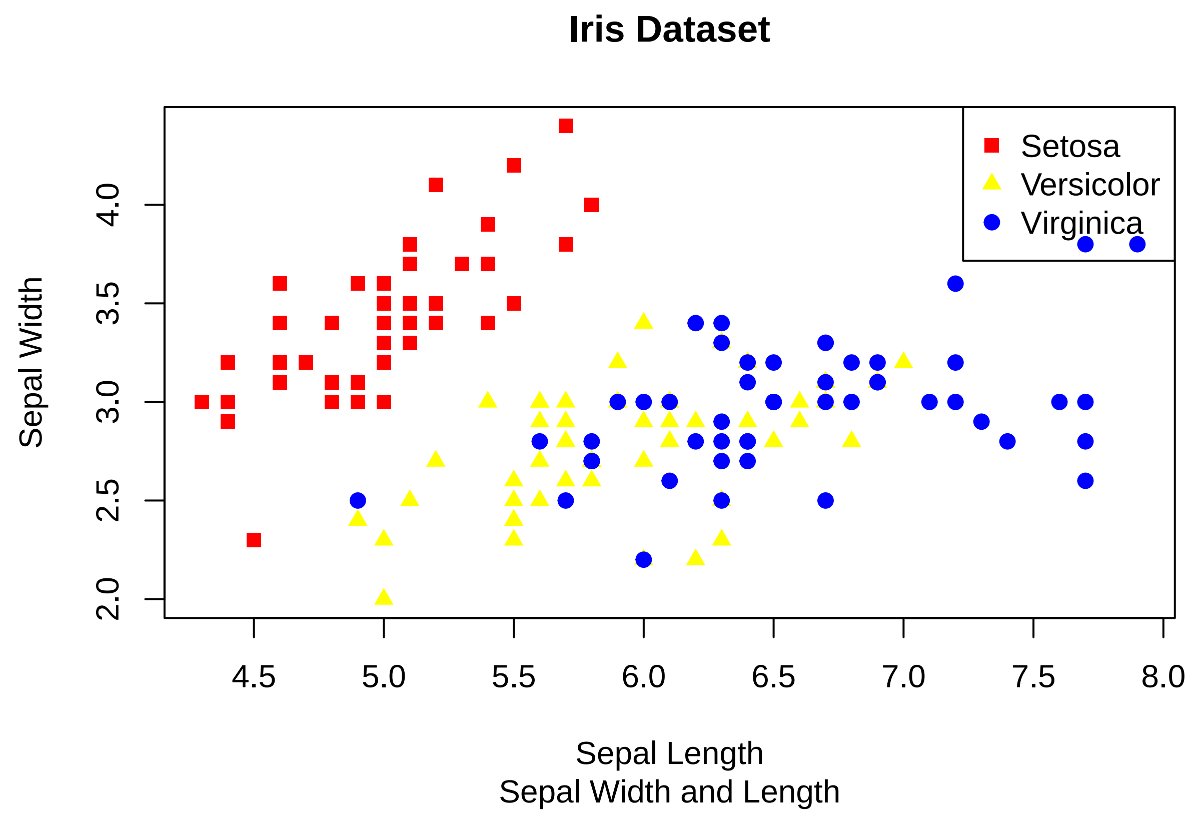
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2     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

```
colors <- c("setosa" = "red", "versicolor" = "yellow", "virginica" = "blue")
symbols <- c("setosa" = 15, "versicolor" = 17, "virginica" = 19)
plot(iris$Sepal.Length, iris$Sepal.Width,
     col = colors[iris$Species],
     pch = symbols[iris$Species],
     main = "Iris Dataset",
     sub = "Sepal Width and Length",
     xlab = "Sepal Length",
     ylab = "Sepal Width")
legend("topright", legend = c("Setosa", "Versicolor", "Virginica"),
       col = c("red", "yellow", "blue"),
       pch = c(15, 17, 19))
```



f. Overall Interpretation

The scatterplot displays clear groupings for each Iris species based on sepal dimensions:

- Setosa (red squares) features shorter, broader sepals, setting it apart from other species.
- Versicolor (yellow triangles) occupies a middle range with moderate sepal length and width.
- Virginica (blue circles) generally has longer, narrower sepals, with some overlap with versicolor.

This visualization highlights species distinctions, with setosa standing out the most and a slight inverse trend between sepal length and width, particularly in virginica.

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")

str(alexa_data)
```

```
## tibble [3,150 x 5] (S3: tbl_df/tbl/data.frame)
##  $ rating           : num [1:3150] 5 5 4 5 5 5 3 5 5 5 ...
##  $ date             : POSIXct[1:3150], format: "2018-07-31" "2018-07-31" ...
##  $ variation       : chr [1:3150] "Charcoal Fabric" "Charcoal Fabric" "Walnut Finish" "Charcoal Fabr
##  $ verified_reviews: chr [1:3150] "Love my Echo!" "Loved it!" "Sometimes while playing a game, you ca
##  $ feedback        : num [1:3150] 1 1 1 1 1 1 1 1 1 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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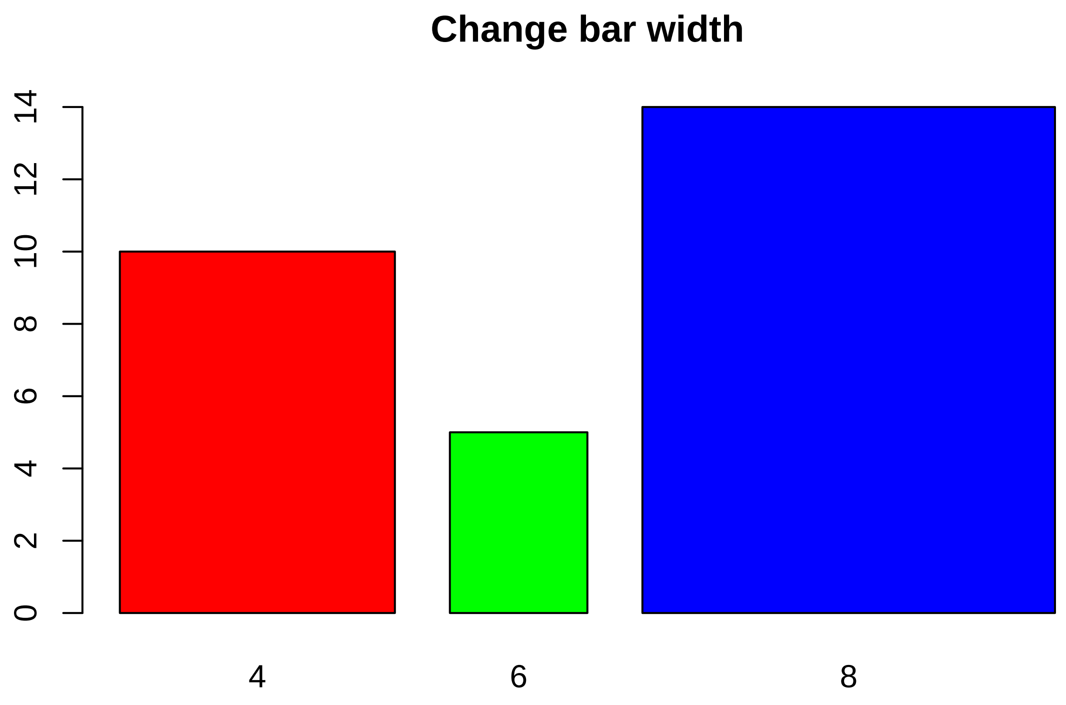
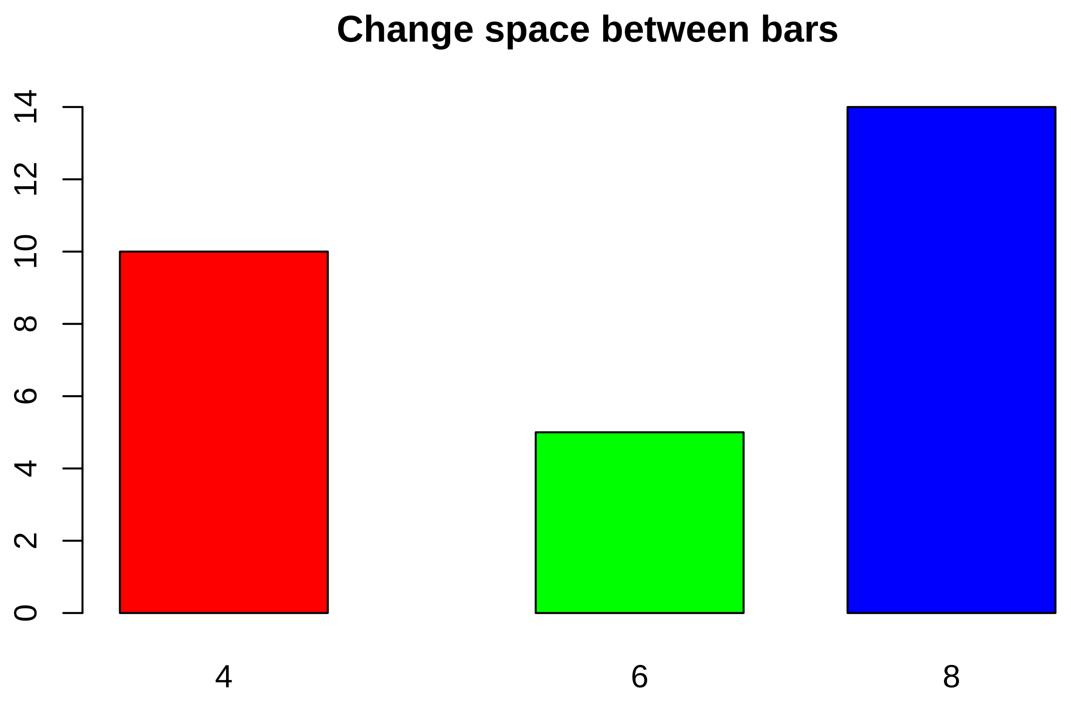
## [859] "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus"
## [865] "BlackPlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [871] "BlackPlus" "WhitePlus" "WhitePlus" "BlackPlus" "BlackPlus" "BlackPlus"
## [877] "BlackPlus" "BlackPlus" "BlackPlus" "WhitePlus" "WhitePlus" "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)

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

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



```
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)
```

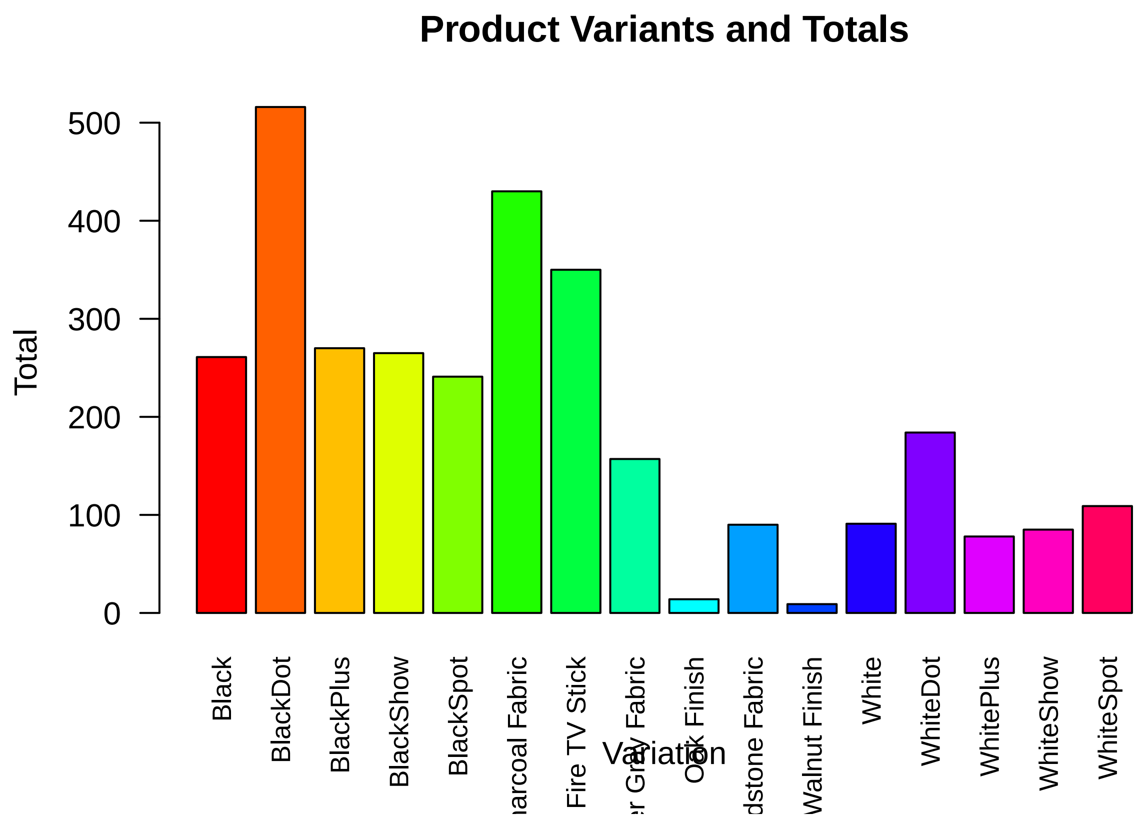
```
##
## Attaching package: 'dplyr'

## 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.

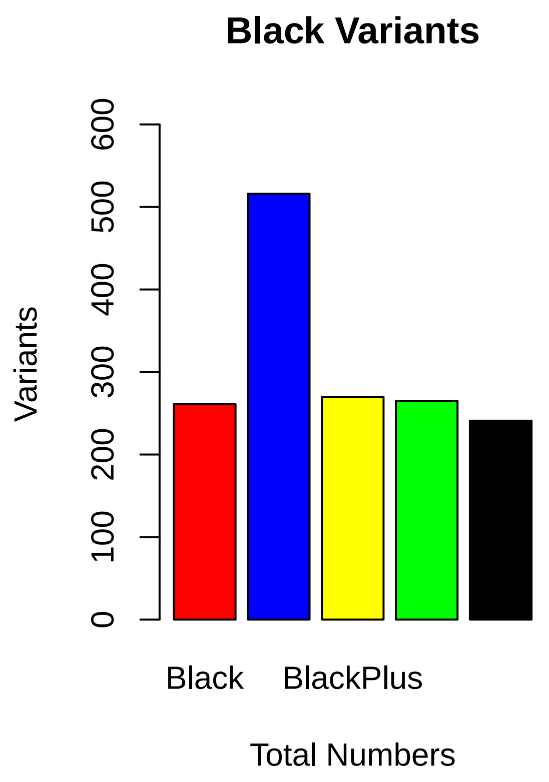
```r
barplot(
  variation_counts$n,
  names.arg = variation_counts$variation,
  col = rainbow(length(variation_counts$variation)),
  main = "Product Variants and Totals",
  xlab = "Variation",
  ylab = "Total",
   las = 2,
   cex.names = 0.8
)
```

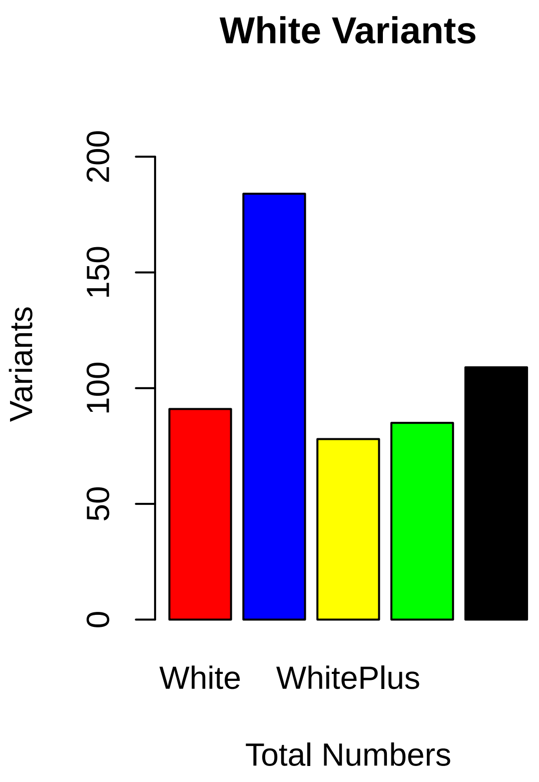


d. Create a barplot() for the black and white variations. Plot it in 1 frame, side by side. Complete the details of the chart.

```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("red", "blue", "yellow", "green", "black"),
        main = "Black Variants",
        xlab = "Total Numbers",
        ylab = "Variants",
        ylim = c(0, max(black_counts$n) * 1.2))
```

```r
barplot(white_counts$n,
        names.arg = white_counts$variation,
        col = c("red", "blue", "yellow", "green", "black"),
        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