RWorksheet_rocillo#4b

Cassandra Jielin Rocillo

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

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

```
##      [,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 2.

```
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

```
x <- 0
y <- 1

z <- readline(prompt = "Enter a number: ")
```

```
## Enter a number:
```

```
repeat {
  z <- x + y
  if (z > 500) break
  x <- y
  y <- z
  print(z)
}
```

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

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(readr)
shoe_size <- read.csv("/cloud/project/worksheet/worksheet 4/worksheet4b/CopyOfShoeSizes.csv")

head(shoe_size)
```

```
##   Shoe.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.

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

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

num_females
```

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

```
num_males
```

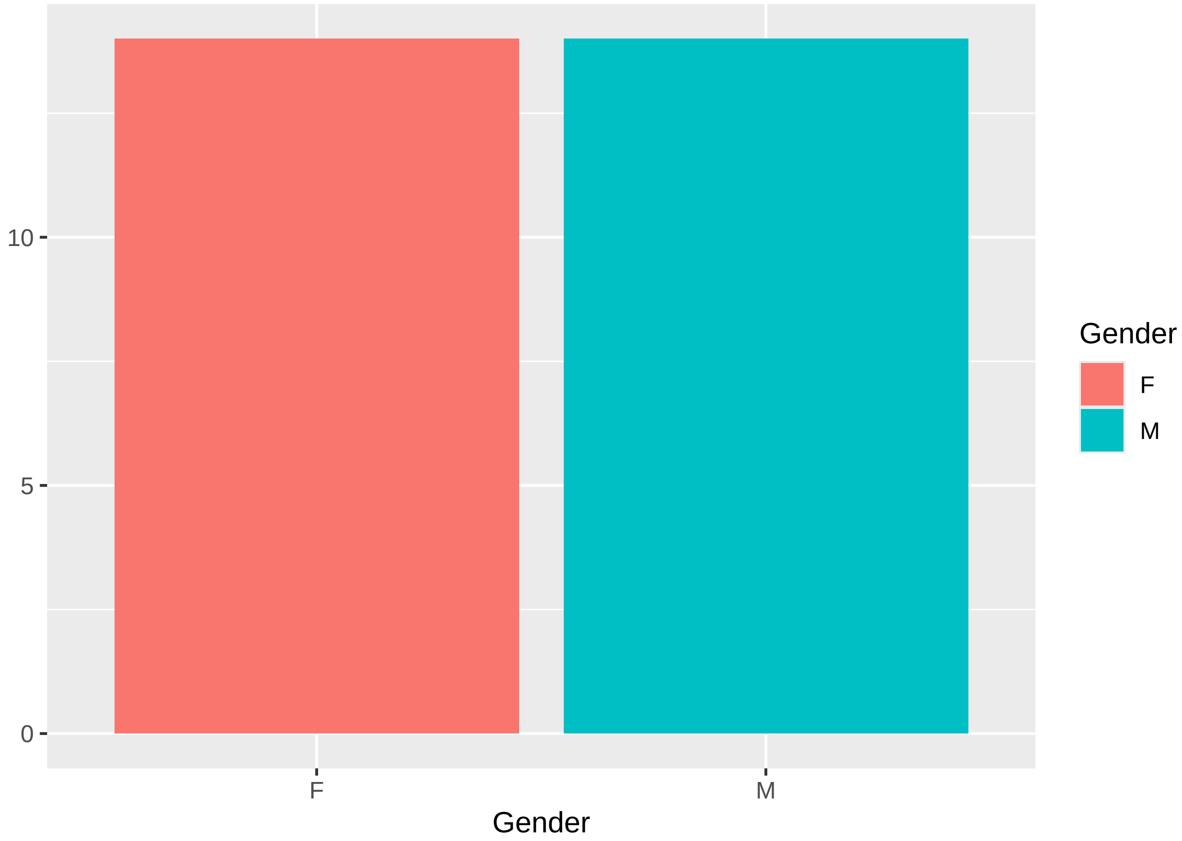
```
## [1] 14
```

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.

```
  library(ggplot2)
qplot(Gender, data = shoe_size,
geom = "bar",
fill = Gender)
```

```
## Warning: `qplot()` was deprecated in ggplot2 3.4.0.
## This warning is displayed once every 8 hours.
## Call `lifecycle::last_lifecycle_warnings()` to see where this warning was
## generated.
```



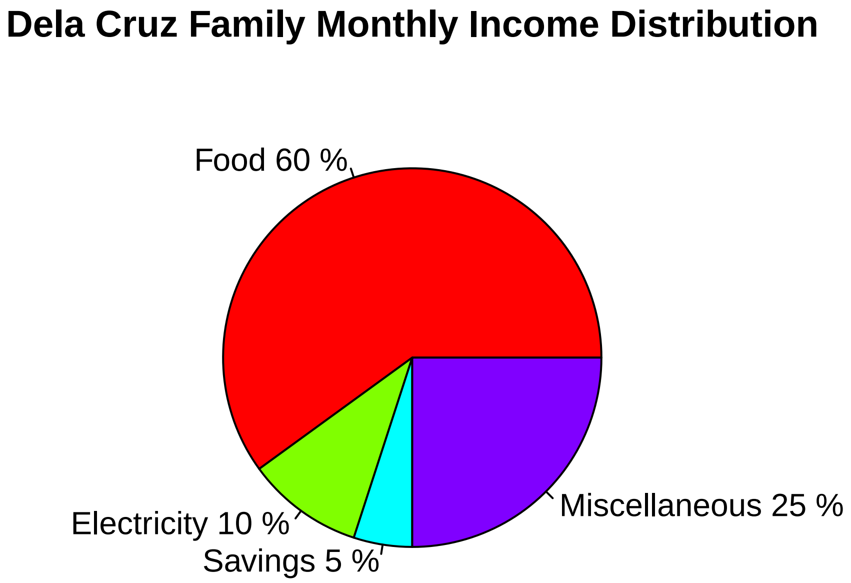
5. The monthly income of Dela Cruz family was spent on the following:

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.

```
categories <- c("Food", "Electricity", "Savings", "Miscellaneous")
expenses <- c(60, 10, 5, 25)

percentages <- round(expenses / sum(expenses) * 100)

pie(expenses, labels = paste(categories, percentages, "%"),
    col = rainbow(length(categories)),
    main = "Dela Cruz Family Monthly Income Distribution")
```



6. Use the iris dataset. data(iris)

a. Check for the structure of the dataset using the str() function.

```
 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 ...
```

Describe what you have seen in the output. - The output shows a data frame with 5 variable sepal.lenght, width, petal.lenght, width and species and the values of the variables.

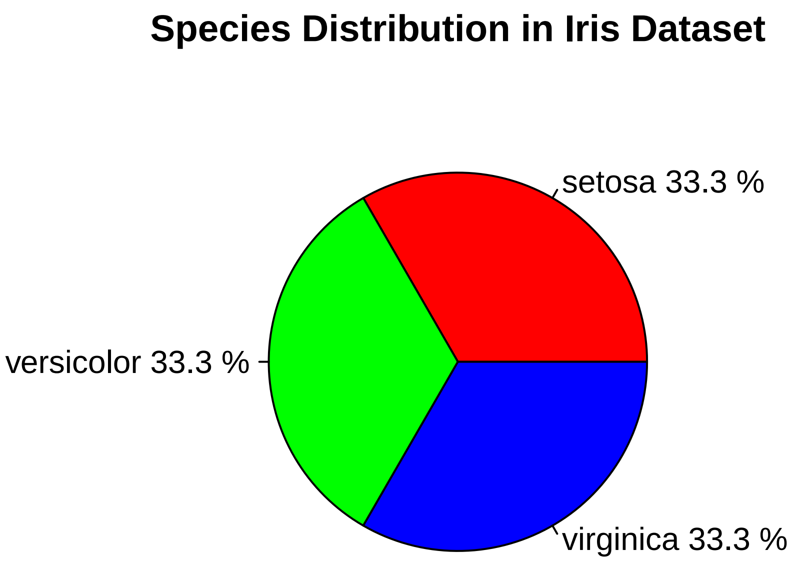
b. Create an R object that will contain the mean of the sepal.length, sepal.width,petal.length,and petal.width. What is the R script and its result?

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

```
## 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), "%"),
    col = rainbow(length(species_counts)),
    main = "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.

```
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
```

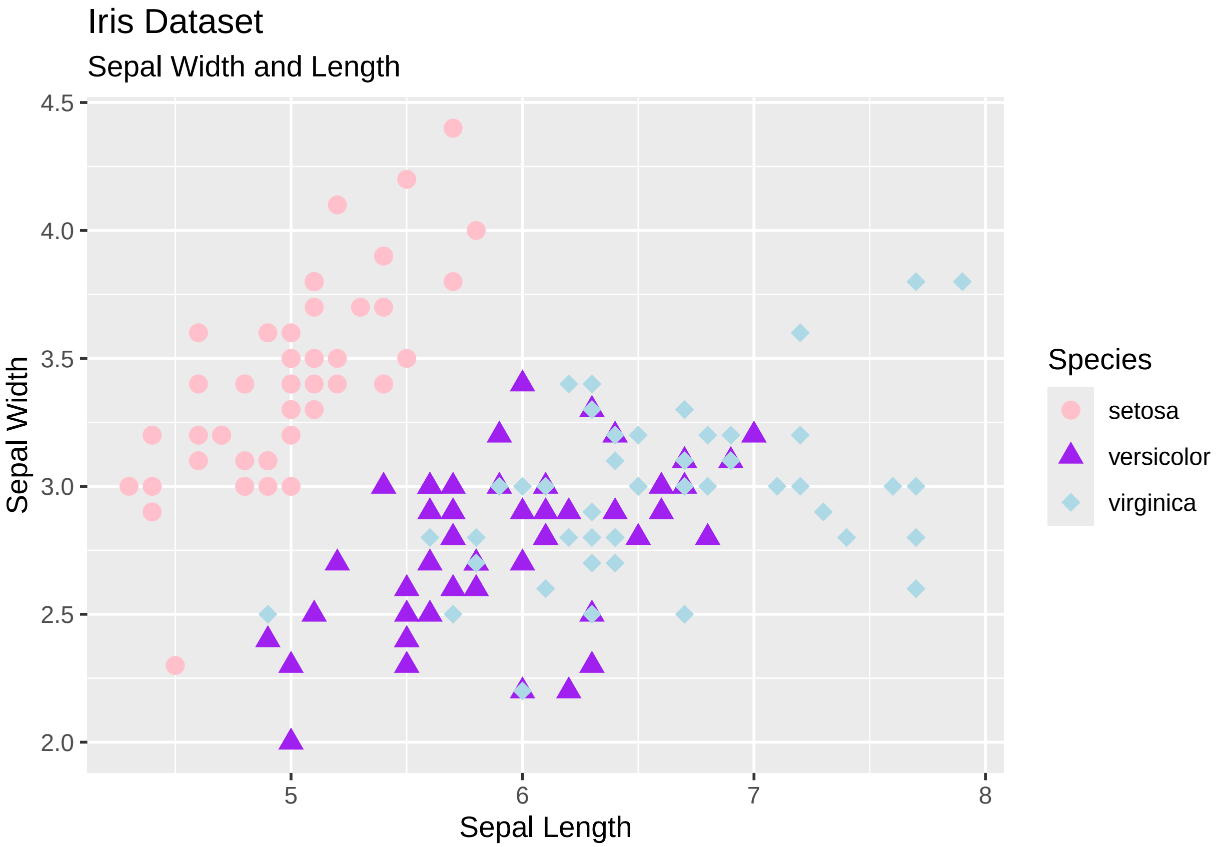
e. Create a scatterplot of the sepal.length and sepal.width using the different species(setosa,versicolor,virginica). Add a title = "Iris Dataset", subtitle = "Sepal width and length, labels for the x and y axis, the pch symbol and colors should be based on the species.

```
library(ggplot2)
data(iris)

iris$Species <- as.factor(iris$Species)

scatter_plot <- ggplot(iris, aes(x = Sepal.Length, y = Sepal.Width, color = Species, shape = Species)) +
  ggtitle("Iris Dataset") +
  labs(subtitle = "Sepal Width and Length", x = "Sepal Length", y = "Sepal Width") +
  geom_point(size = 3) +
  scale_color_manual(values = c("setosa" = "pink", "versicolor" = "purple", "virginica" = "lightblue"))
  scale_shape_manual(values = c(16, 17, 18))


print(scatter_plot)
```



f. Interpret the result.

- the data shows the Iris Data and its 3 different species and the sepal width and sepal length of the Iris.

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_data <- read_excel("alexa_file.xlsx")
alexa_data
```

```
## # 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
```

a. Rename the white and black variants by using gsub() function. Syntax: RObject$columnName < -gsub(”OldName”, ”NewName”, RObject$columnName)

```
alexa_data$variation <- gsub("Sandstone Fabric", "SandstoneFabric", alexa_data$variation)
alexa_data
```

```
## # 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 SandstoneFabric     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
```

```
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)

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
```

```
## # 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 SandstoneFabric     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
```

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")

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)

```
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
```

```
variations <- alexa_data %>%
  count(alexa_data$variation)

  save(variations, file = "/cloud/project/worksheet/worksheet 4/worksheet4b/variations.RData")
load("variations.RData")

  variations
```

```
## # A tibble: 16 x 2
##    `alexa_data$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 SandstoneFabric                 90
## 11 Walnut Finish                    9
## 12 White                           91
## 13 White  Dot                     184
## 14 White  Plus                     78
## 15 White  Show                     85
## 16 White  Spot                    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
load("variations.RData")
library(kableExtra)
```

```
##
## Attaching package: 'kableExtra'

## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```r
variation_counts <- setNames(variations$n, variations$variation)
```

```
## Warning: Unknown or uninitialised column: `variation`.
```

```r
load("variations.RData")

variations_data <- data.frame(variations)

kable(variations_data, col.names = c("Variation", "Total"),
      align = c("l", "c"))
```

Variation	Total
Black	261
Black Dot	516
Black Plus	270
Black Show	265
Black Spot	241
Charcoal Fabric	430
Configuration: Fire TV Stick	350
Heather Gray Fabric	157
Oak Finish	14
SandstoneFabric	90
Walnut Finish	9
White	91
White Dot	184
White Plus	78
White Show	85
White Spot	109

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(ggplot2)
library(gridExtra)
```

```
##
## Attaching package: 'gridExtra'

## The following object is masked from 'package:dplyr':
##
##     combine
```

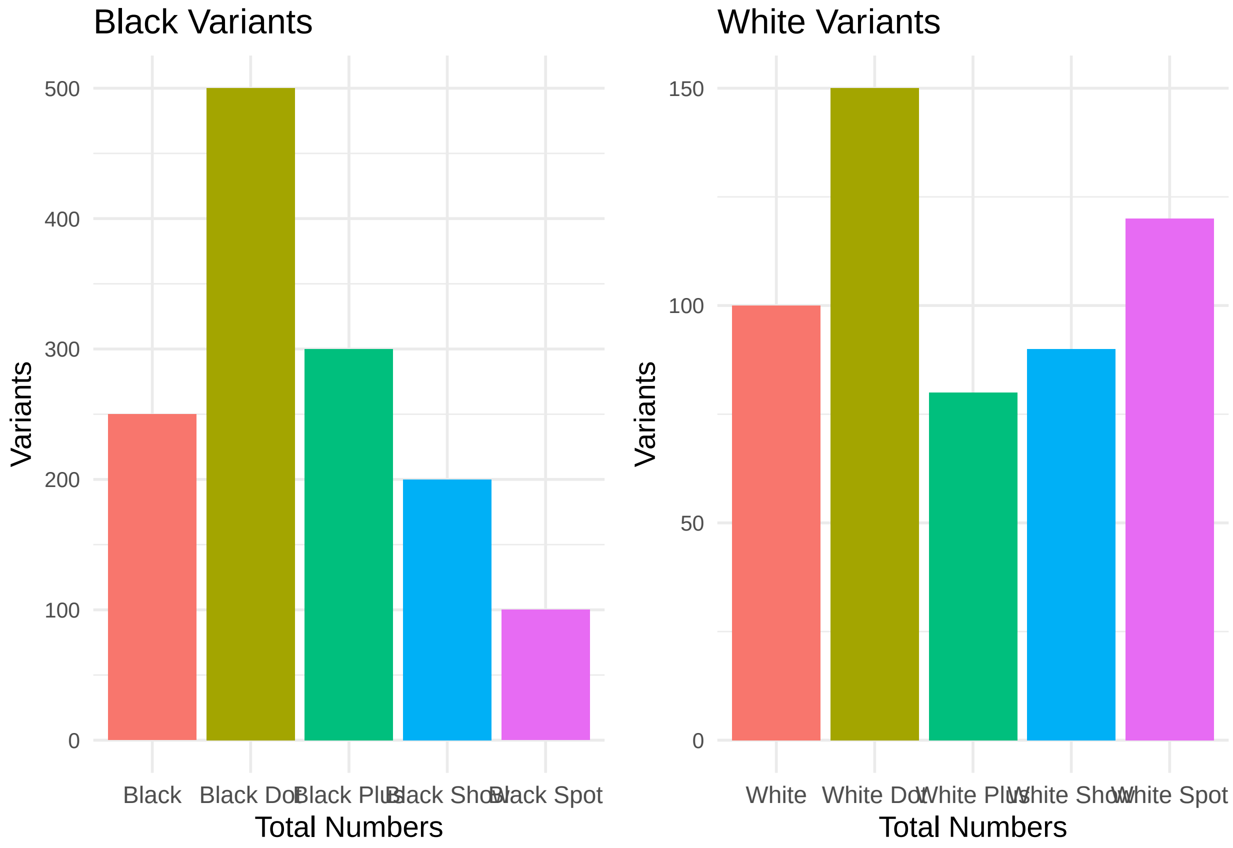
```r
black_var <- data.frame(
  variation = c("Black", "Black Plus", "Black Show", "Black Spot", "Black Dot"),
  Count = c(250, 300, 200, 100, 500)
)
```

```
white_var <- data.frame(
  variation = c("White", "White Dot", "White Plus", "White Show", "White Spot"),
  Count = c(100, 150, 80, 90, 120)
)

plot_black <- ggplot(black_var, aes(x = variation, y = Count, fill = variation)) +
  geom_bar(stat = "identity") +
  labs(title = "Black Variants", y = "Variants", x = "Total Numbers") +
  theme_minimal() +
  theme(
    legend.position = "none",
    axis.text.y = element_text(size = 8)
  )

plot_white <- ggplot(white_var, aes(x = variation, y = Count, fill = variation)) +
  geom_bar(stat = "identity") +
  labs(title = "White Variants", y = "Variants", x = "Total Numbers") +
  theme_minimal() +
  theme(
    legend.position = "none",
    axis.text.y = element_text(size = 8)
  )

grid.arrange(plot_black, plot_white, ncol = 2)
```


Black Variants
Variants
Black
Black Dot
Black Plus
Black Show
Black Spot
Total Numbers
White Variants
Variants
White
White Dot
White Plus
White Show
White Spot
Total Numbers