# RWorksheet_4B

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```
#1
vectorA <- c(1, 2, 3, 4, 5)
matrix_result <- matrix(0, nrow = 5, ncol = 5)
for (i in 1:5) {
  for (j in 1:5) {
    matrix_result[i, j] <- abs(vectorA[i] - vectorA[j])
  }
}
print(matrix_result)
```

```
##      [,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
num_rows <- 5
for (i in 1:num_rows) {
  for (j in 1:i) {
    cat("*")
  }
  cat("\n")
}
```

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

```
#3
num <- as.integer(readline(prompt = "Enter the starting number for Fibonacci sequence: "))
```

```
## Enter the starting number for Fibonacci sequence:
```

```
if (is.na(num)) {
  cat("Please enter a valid integer.\n")
} else {
  c <- 0
  d <- 1
  repeat {
    fib <- c + d
    if (fib > 500) {
```

```
      break
    }
    if (!is.na(fib) && fib >= num) {
      cat(fib, "\n")
    }
    c <- d
    d <- fib
  }
}
```

```
## Please enter a valid integer.
```

```
#4A
data_file <- read.csv(file = "data.csv",header = T, stringsAsFactors = F,sep = ",")
data_file
```

```
##    Shoe.Size Height Gender Shoe.Size.1 Height.1 Gender.1
## 1        6.5   66.0      F        13.0       77        M
## 2        9.0   68.0      F        11.5       72        M
## 3        8.5   64.5      F         8.5       59        F
## 4        8.5   65.0      F         5.0       62        F
## 5       10.5   70.0      M        10.0       72        M
## 6        7.0   64.0      F         6.5       66        F
## 7        9.5   70.0      F         7.5       64        F
## 8        9.0   71.0      F         8.5       67        M
## 9       13.0   72.0      M        10.5       73        M
## 10       7.5   64.0      F         8.5       69        F
## 11      10.5   74.0      M        10.5       72        M
## 12       8.5   67.0      F        11.0       70        M
## 13      12.0   71.0      M         9.0       69        M
## 14      10.5   71.0      M        13.0       70        M
```

```
data_file$Shoe.Size[1:6]
```

```
## [1]  6.5  9.0  8.5  8.5 10.5  7.0
```

```
#4B
male_count_gender <- sum(data_file$Gender == "M")
female_count_gender <- sum(data_file$Gender == "F")
male_count_gender1 <- sum(data_file$Gender.1 == "M")
female_count_gender1 <- sum(data_file$Gender.1 == "F")
total_males <- male_count_gender + male_count_gender1
total_females <- female_count_gender + female_count_gender1
cat("Total number of males:", total_males, "\n")
```

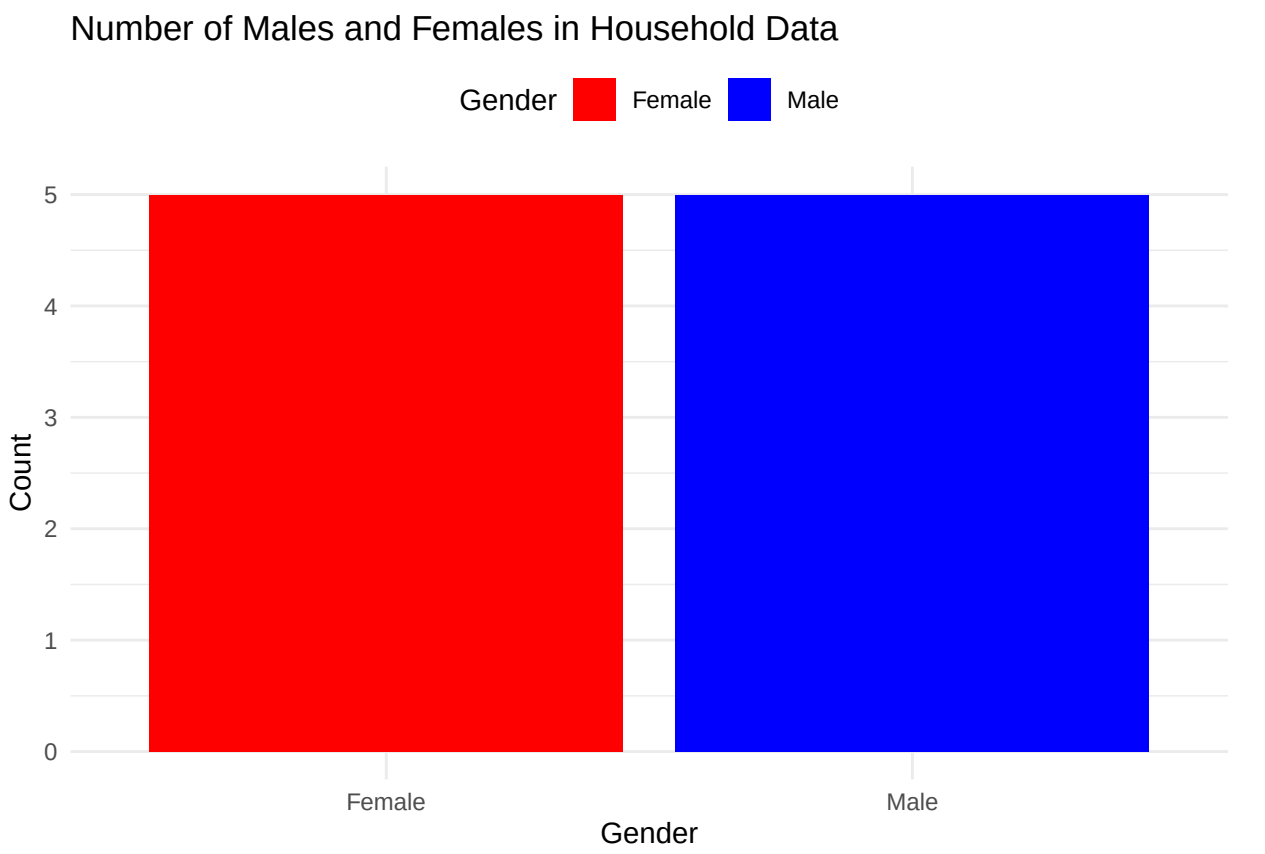
```
## Total number of males: 14
```

```
cat("Total number of females:", total_females)
```

```
## Total number of females: 14
```

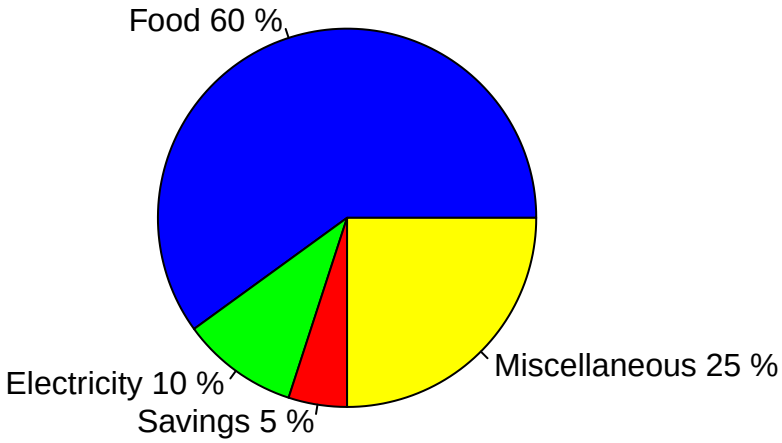
```
#4c
library(ggplot2)
household_data <- data.frame(
  Gender = c("Male", "Female"),
  Count = c(5, 5)
)
ggplot(household_data, aes(x = Gender, y = Count, fill = Gender)) +
```

```
  geom_bar(stat = "identity") +
  scale_fill_manual(values = c("Male" = "blue", "Female" = "red")) +
  labs(title = "Number of Males and Females in Household Data",
       x = "Gender",
       y = "Count") +
  theme_minimal() +
  theme(legend.position = "top")
```




```
#5
categories <- c("Food", "Electricity", "Savings", "Miscellaneous")
expense <- c(60, 10, 5, 25)
percentages <- round((expense / sum(expense)) * 100)
colors <- c("blue", "green", "red", "yellow")
pie(percentages,
    labels = paste(categories, percentages, "%"),
    col = colors,
    main = "Monthly Income Expense of Dela Cruz Family")
```

## Monthly Income Expense of Dela Cruz Family




```
#6
data("iris")
str("iris")
```

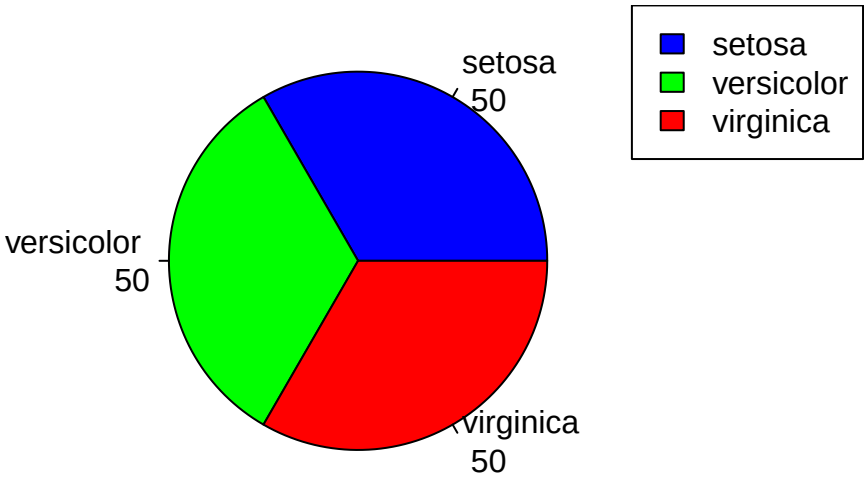
```
##  chr "iris"
```

```
#6B
data(iris)
mean_values <- colMeans(iris[, 1:4])
print(mean_values)
```

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

```
#6C
data(iris)
species_counts <- table(iris$Species)
colors <- c("blue", "green", "red")
pie(species_counts,
    labels = paste(names(species_counts), "\n", species_counts),
    col = colors,
    main = "Species Distribution in Iris Dataset")
legend("topright", legend = names(species_counts), fill = colors)
```

## Species Distribution in Iris Dataset




```
#6D
data(iris)
setosa <- subset(iris, Species == "setosa")
versicolor <- subset(iris, Species == "versicolor")
virginica <- subset(iris, Species == "virginica")
cat("Last 6 rows of Setosa:\n")
```

```
## Last 6 rows of Setosa:
```

```
print(tail(setosa, 6))
```

```
##    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
```

```
cat("\nLast 6 rows of Versicolor:\n")
```

```
##
## Last 6 rows of Versicolor:
```

```
print(tail(versicolor, 6))
```

```
##     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
```

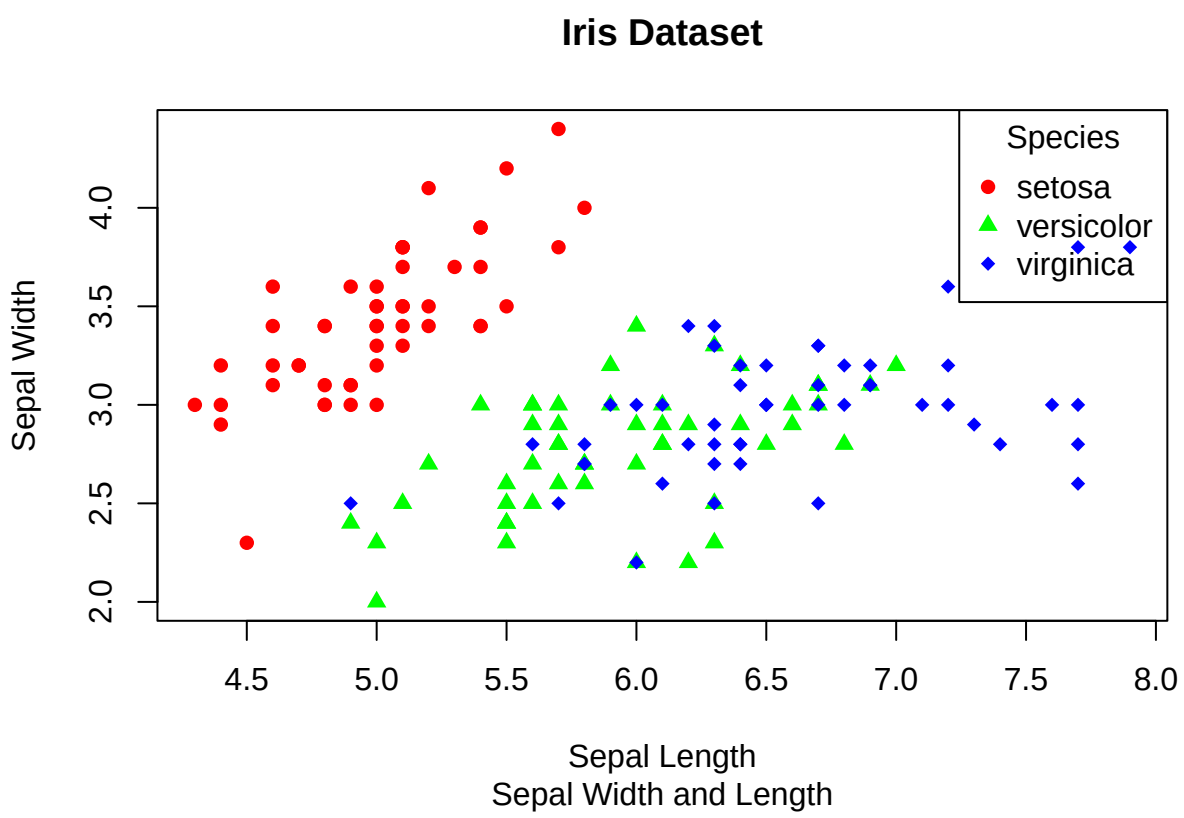
```
cat("\nLast 6 rows of Virginica:\n")
```

```
##
## Last 6 rows of Virginica:
```

```r
print(tail(virginica, 6))
```

```
##     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
```

```r
#6E
data(iris)
iris$Species <- as.factor(iris$Species)
colors <- c("red", "green", "blue")
pch_values <- c(16, 17, 18)
plot(iris$Sepal.Length, iris$Sepal.Width,
     col = colors[iris$Species],
     pch = pch_values[iris$Species],
     main = "Iris Dataset",
     sub = "Sepal Width and Length",
     xlab = "Sepal Length",
     ylab = "Sepal Width")
legend("topright", legend = levels(iris$Species),
       col = colors, pch = pch_values,
       title = "Species")
```




```r
#6F
"The scatter plot reveals that the three iris species-Setosa, Versicolor, and Virginica-form distinct cl
```

```
## [1] "The scatter plot reveals that the three iris species-Setosa, Versicolor, and Virginica-form dis
```

```
#7A

library(readxl)
data1 <- read_excel("alexa_file.xlsx")
data1
```

```
## # 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
```

```
data1$variation <- gsub("Black\\s+Dot", "Black Dot", data1$variation)
data1$variation <- gsub("Black\\s+Plus", "Black Plus", data1$variation)
data1$variation <- gsub("Black\\s+Show", "Black Show", data1$variation)
data1$variation <- gsub("Black\\s+Spot", "Black Spot", data1$variation)
data1$variation <- gsub("White\\s+Dot", "White Dot", data1$variation)
data1$variation <- gsub("White\\s+Plus", "White Plus", data1$variation)
data1$variation <- gsub("White\\s+Show", "White Show", data1$variation)
data1$variation <- gsub("White\\s+Spot", "White Spot", data1$variation)


table(data1$variation)
```

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

```
#7B
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_count <- data1 %>%
  count(variation, name = "Total")
save(variations_count, file = "variations.RData")
print(variations_count)
```

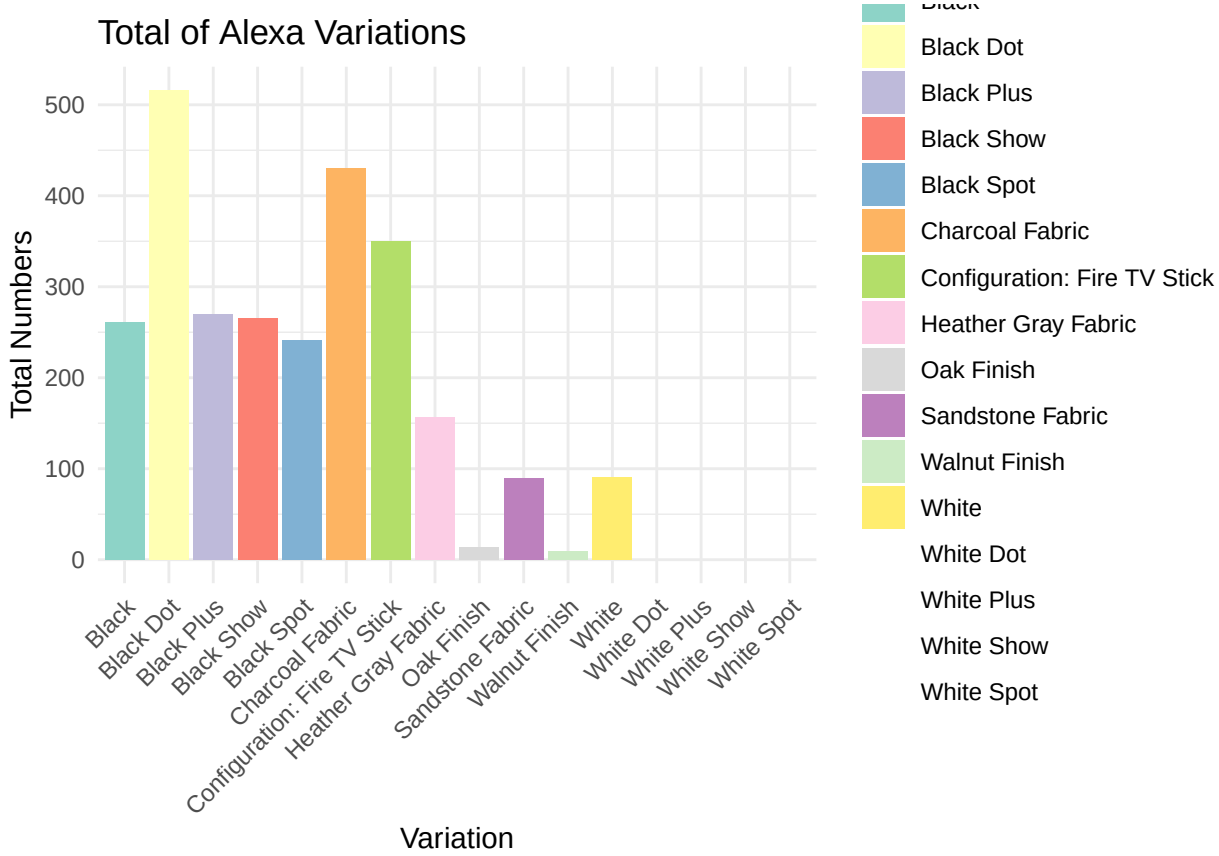
```
## # A tibble: 16 x 2
##    variation                    Total
##    <chr>                        <int>
##  1 Black                          261
##  2 Black Dot                      516
##  3 Black Plus                     270
##  4 Black Show                     265
##  5 Black Spot                     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
```

```
#7C
library(ggplot2)

load("variations.RData")


ggplot(variations_count, aes(x = variation, y = Total, fill = variation)) +
  geom_bar(stat = "identity") +
  ggtitle("Total of Alexa Variations") +
  xlab("Variation") +
  ylab("Total Numbers") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
  scale_fill_brewer(palette = "Set3")
```

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Set3 is 12
## Returning the palette you asked for with that many colors
```

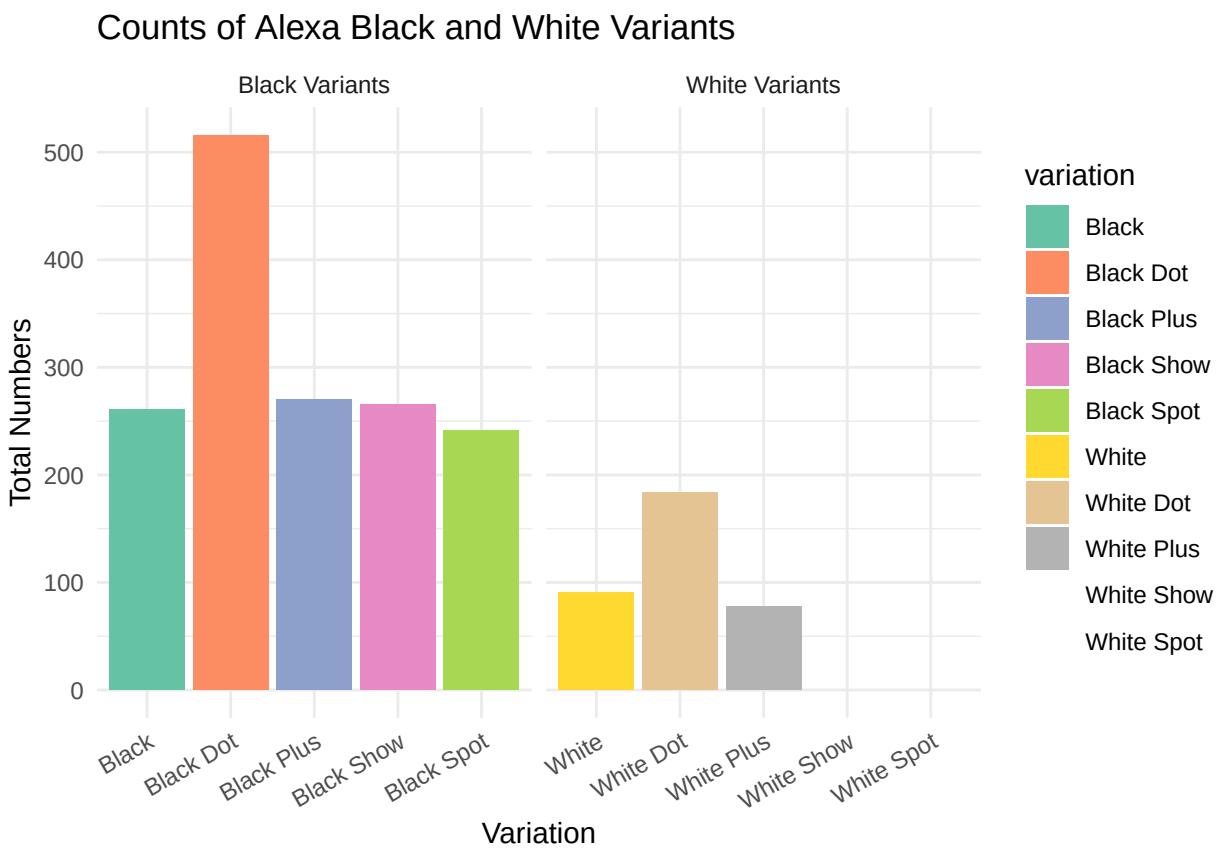



```
#7D
variations_count$Category <- ifelse(grepl("Black", variations_count$variation), "Black Variants",
ifelse(grepl("White", variations_count$variation), "White Variants", NA))

black_white_variants <- variations_count %>% filter(!is.na(Category))


ggplot(black_white_variants, aes(x = variation, y = Total, fill = variation)) +
  geom_bar(stat = "identity") +
  facet_wrap(~ Category, scales = "free_x") +
  ggtitle("Counts of Alexa Black and White Variants") +
  xlab("Variation") +
  ylab("Total Numbers") +
  theme_minimal() +
  theme(axis.text.x = element_text(angle = 30, hjust = 1)) +
  scale_fill_brewer(palette = "Set2")
```

```
## Warning in RColorBrewer::brewer.pal(n, pal): n too large, allowed maximum for palette Set2 is 8
## Returning the palette you asked for with that many colors
```


Counts of Alexa Black and White Variants
Black Variants
White Variants
Total Numbers
500
400
300
200
100
0
Black
Black Dot
Black Plus
Black Show
Black Spot
White
White Dot
White Plus
White Show
White Spot
Variation
variation
Black
Black Dot
Black Plus
Black Show
Black Spot
White
White Dot
White Plus
White Show
White Spot