RWorksheet_Cacho#4b

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

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
for (i in 1:5) {
  cat(rep("* ", i), "\n")
}
```

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

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

```
## Enter the first number:
```

```
if (is.na(first)) {
cat("Enter an integer.\n")
} else {
cat(first, "", sep = "")
fibonacci <- c(first)
repeat {
if (length(fibonacci) < 2) {
next_num <- first
} else {
next_num <- sum(tail(fibonacci, 2))
}
if (next_num > 500) {
```

```r
break
}
cat(" ", next_num, sep = "")
fibonacci <- c(fibonacci, next_num)
}
}
```

```
## Enter an integer.
```

```r
# 4a
library(readr)
sample_data <- read_csv("sample_data.csv")
```

```
## Rows: 28 Columns: 3
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## chr (1): Gender
## dbl (2): ShoeSize, Height
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this message.
```

```r
data <- read.csv("sample_data.csv")
head(data)
```

```
##   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
```

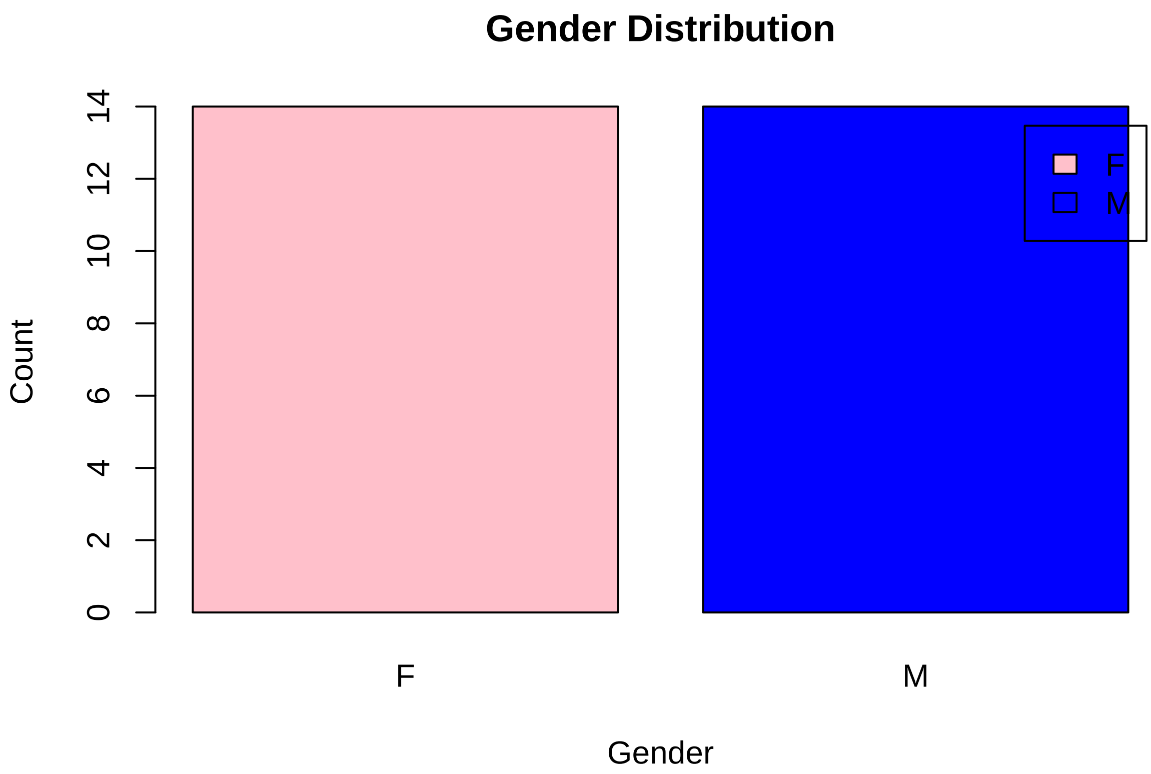
```r
# 4b
femdata <- subset(data, Gender == "F")
maledata <- subset(data, Gender == "M")
cat("Female count:", nrow(femdata),"\n")
```

```
## Female count: 14
```

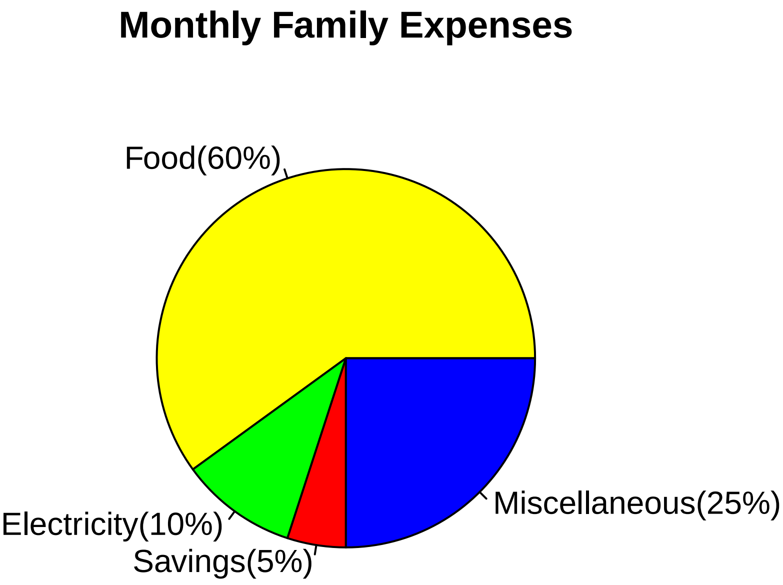
```r
cat("Male count:", nrow(maledata),"\n")
```

```
## Male count: 14
```

```r
# 4c
gender_count <- table(data$Gender)
barplot(gender_count, main= "Gender Distribution", col = c("pink", "blue"),
        xlab="Gender", ylab="Count", legend=TRUE)
```



```r
# 5
expenses <- c(Food = 60, Electricity = 10, Savings = 5, Miscellaneous = 25)
percent <- paste0(names(expenses),"(", round(100*expenses / sum(expenses), 1), "%)")
pie(expenses, labels= percent, col = c("yellow", "green", "red", "blue"), main = "Monthly Family Expens
```



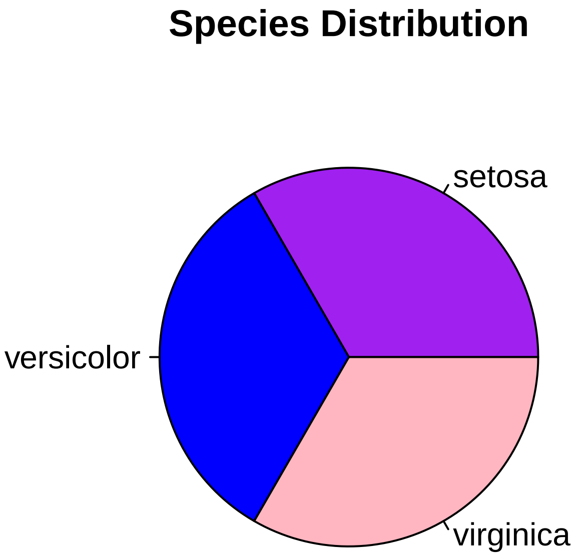
```r
# 6a
data(iris)
str(iris)
```

```
## '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 ...
```

```
# 6b
mean_values <- colMeans(iris[, c("Sepal.Length", "Sepal.Width", "Petal.Length", "Petal.Width")])
mean_values
```

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

```
# 6c
species_counts <- table(iris$Species)
pie(species_counts, main="Species Distribution", col=c("purple", "blue", "lightpink"),
    labels=names(species_counts))
```



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

```
## Last six rows of Setosa:
```

```
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
```

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

```
##
## Last six rows of Versicolor:
```

```
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
```

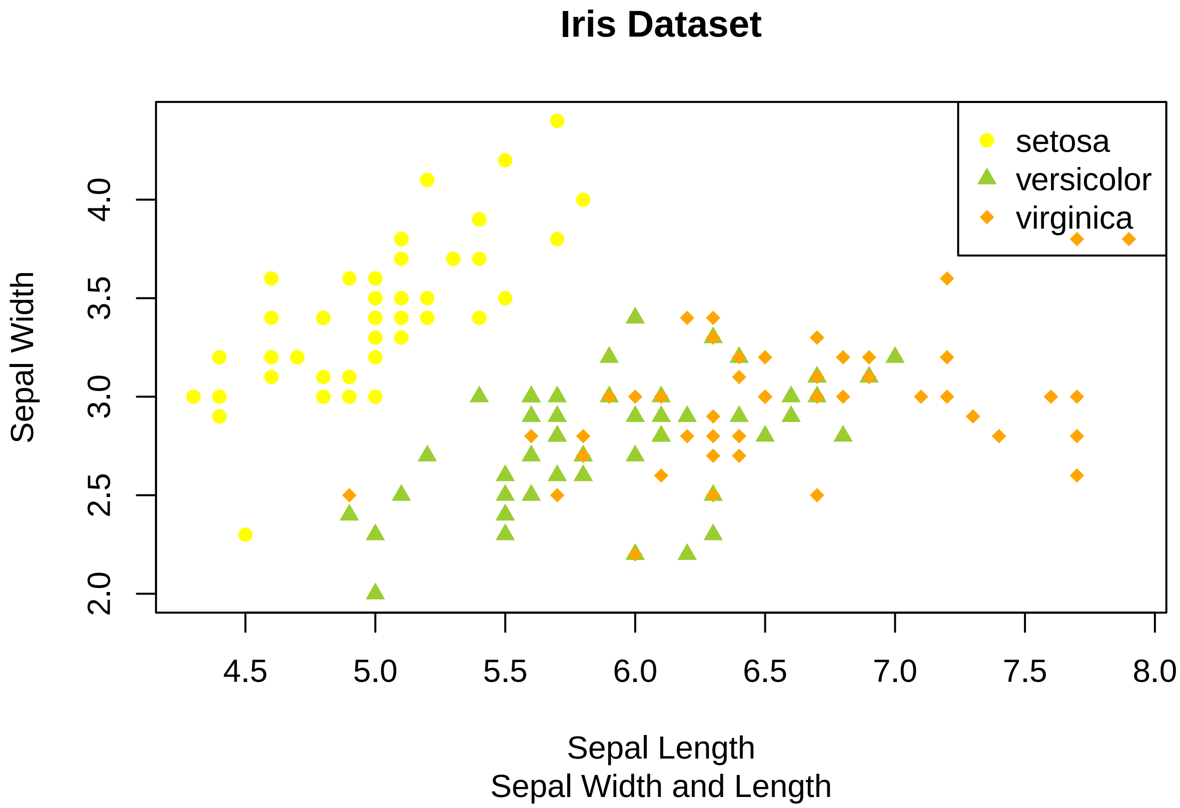
```
cat("\nLast six rows of Virginica:\n")
```

```
##
## Last six rows of Virginica:
```

```
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
```

```
# 6e
iris$Species <- as.factor(iris$Species)
plot(iris$Sepal.Length, iris$Sepal.Width,
main = "Iris Dataset",
sub = "Sepal Width and Length",
xlab = "Sepal Length",
ylab = "Sepal Width",
col = c("yellow", "yellowgreen", "orange")[iris$Species],
pch = c(16, 17, 18)[iris$Species])

legend("topright", legend = levels(iris$Species),
col = c("yellow", "yellowgreen", "orange"), pch = c(16, 17, 18))
```



```
# 6f
#In this plot, we can observe the classification of species based on sepal dimensions. Example, Setosa
```

```
# 7a
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("alexa_file.xlsx")

print(head(alexa_data))
```

```
## # A tibble: 6 x 5
##   rating date                Variant          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
```

```
print(colnames(alexa_data))
```

```
## [1] "rating"           "date"             "Variant"          "verified_reviews"
## [5] "feedback"
```

```
if ("Variant" %in% colnames(alexa_data)) {
    alexa_data$Variant <- gsub("^\\s+|\\s+$", "", alexa_data$Variant)
    alexa_data$Variant <- gsub("Black Dot", "BlackDot", alexa_data$Variant)
    alexa_data$Variant <- gsub("Black Plus", "BlackPlus", alexa_data$Variant)
    alexa_data$Variant <- gsub("Black Show", "BlackShow", alexa_data$Variant)
    alexa_data$Variant <- gsub("Black Spot", "BlackSpot", alexa_data$Variant)
    alexa_data$Variant <- gsub("White Dot", "WhiteDot", alexa_data$Variant)
    alexa_data$Variant <- gsub("White Plus", "WhitePlus", alexa_data$Variant)
    alexa_data$Variant <- gsub("White Show", "WhiteShow", alexa_data$Variant)
    alexa_data$Variant <- gsub("White Spot", "WhiteSpot", alexa_data$Variant)

    print(head(alexa_data))
} else {
    stop("The specified column 'Variant' does not exist in the dataframe.")
}
```

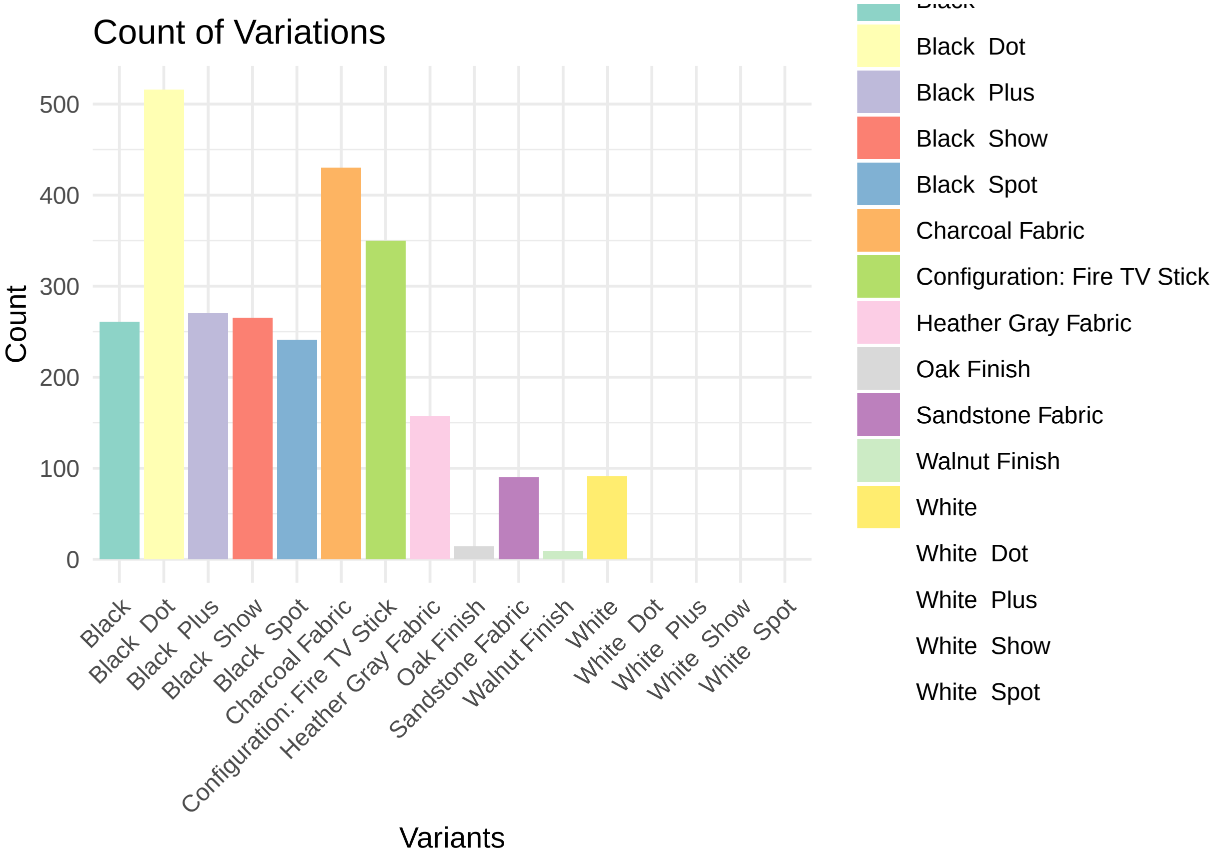
```
## # A tibble: 6 x 5
##   rating date                Variant             verified_reviews       feedback
##    <dbl> <dttm>              <chr>               <chr>                     <dbl>
## 1      5 2018-07-31 00:00:00 Charcoal Fabric     Love my Echo!                 1
## 2      5 2018-07-31 00:00:00 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
```

```
#7.b
if ("Variant" %in% colnames(alexa_data)) {
alexa_data$Variant <- gsub("^\\s+|\\s+$", "", alexa_data$Variant)
variations_count <- alexa_data %>%
count(Variant)
print(variations_count)

save(variations_count, file = "variations.RData")
} else {
stop("The specified column 'variant' does not exist in the dataframe.")
}
```

```
## # A tibble: 16 x 2
##    Variant                          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
```

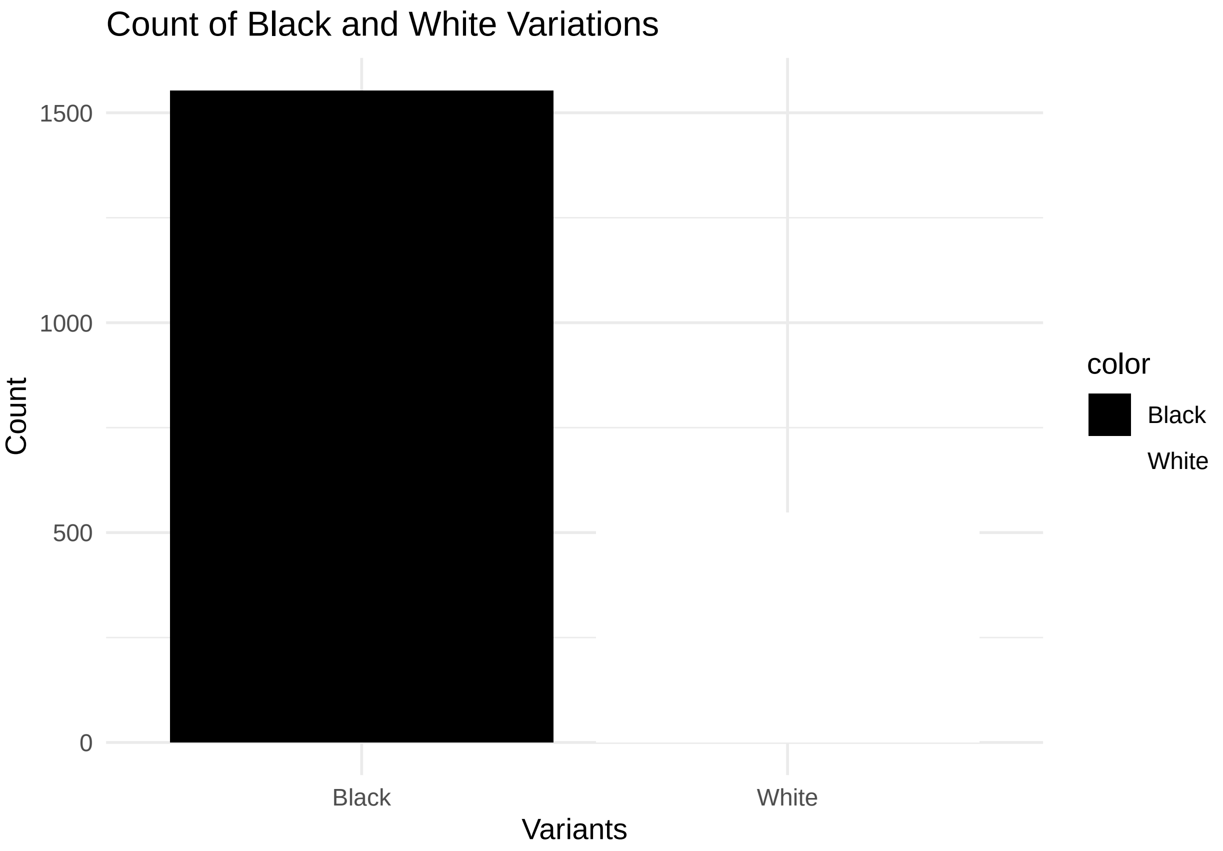
```
#7.c
library(ggplot2)

load("variations.RData")

ggplot(variations_count, aes(x = Variant, y = n, fill = Variant)) +
geom_bar(stat = "identity") +
labs(title = "Count of Variations",
x = "Variants",
y = "Count") +
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
```



```
#7.d
library(gapminder)
```

```r
library(dplyr)
library(ggplot2)


load("variations.RData")

black_Variations <- variations_count %>%
    filter(grepl("Black", Variant)) %>%
    summarise(n = sum(n)) %>%
    mutate(color = "Black")

white_Variations <- variations_count %>%
    filter(grepl("White", Variant)) %>%
    summarise(n = sum(n)) %>%
    mutate(color = "White")

combined_variations <- rbind(black_Variations, white_Variations)

ggplot(combined_variations, aes(x = color, y = n, fill = color)) +
    geom_bar(stat = "identity", position = "dodge") +
    labs(title = "Count of Black and White Variations",
         x = "Variants",
         y = "Count") +
    theme_minimal() +
    scale_fill_manual(values = c("Black" = "black", "White" = "white")) +
    theme(axis.text.x = element_text(angle = 0, hjust = 0.5))
```


Count of Black and White Variations
Count
Black
White
Variants
color
■ Black
White