RWorksheet_Pabriaga#4b

John Martin S. Pabriaga

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```
#1.
vectorA <- c(1, 2, 3, 4, 5)

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

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

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

result_matrix
```

```
##      [,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.
matrix_size <- 5
matrix <- matrix(0, nrow = matrix_size, ncol = matrix_size)

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

cat("Transformed Matrix:\n")
```

```
## Transformed Matrix:
```

```
print(matrix)
```

```
##      [,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
```

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

```
rows <- 5
cat("Star Pattern:\n")
```

```
## Star Pattern:
```

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

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

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

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

```
if (is.na(first)) {
  cat("Please enter a valid 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) {
      break
    }

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

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

```
#4.a
household <- read.table("DataFrame.csv", header = TRUE, sep = ",")
print("Data loaded successfully:")
```

```
## [1] "Data loaded successfully:"
```

```
print(head(household))
```

```
##   ShoeSize Height Gender  X X.1 X.2
## 1      6.5   66.0      F NA  NA  NA
## 2      9.0   68.0      F NA  NA  NA
## 3      8.5   64.5      F NA  NA  NA
```

```
## 4      8.5   65.0      F NA  NA  NA
## 5     10.5   70.0      M NA  NA  NA
## 6      7.0   64.0      F NA  NA  NA
```

```
str(household)
```

```
## 'data.frame':    28 obs. of  6 variables:
##  $ ShoeSize: num  6.5 9 8.5 8.5 10.5 7 9.5 9 13 7.5 ...
##  $ Height  : num  66 68 64.5 65 70 64 70 71 72 64 ...
##  $ Gender  : chr  "F" "F" "F" "F" ...
##  $ X       : logi  NA NA NA NA NA NA ...
##  $ X.1     : logi  NA NA NA NA NA NA ...
##  $ X.2     : logi  NA NA NA NA NA NA ...
```

```
#4.b

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

male_count <- nrow(male_data)
female_count <- nrow(female_data)

cat("Number of observations in Male:", male_count, "\n")
```

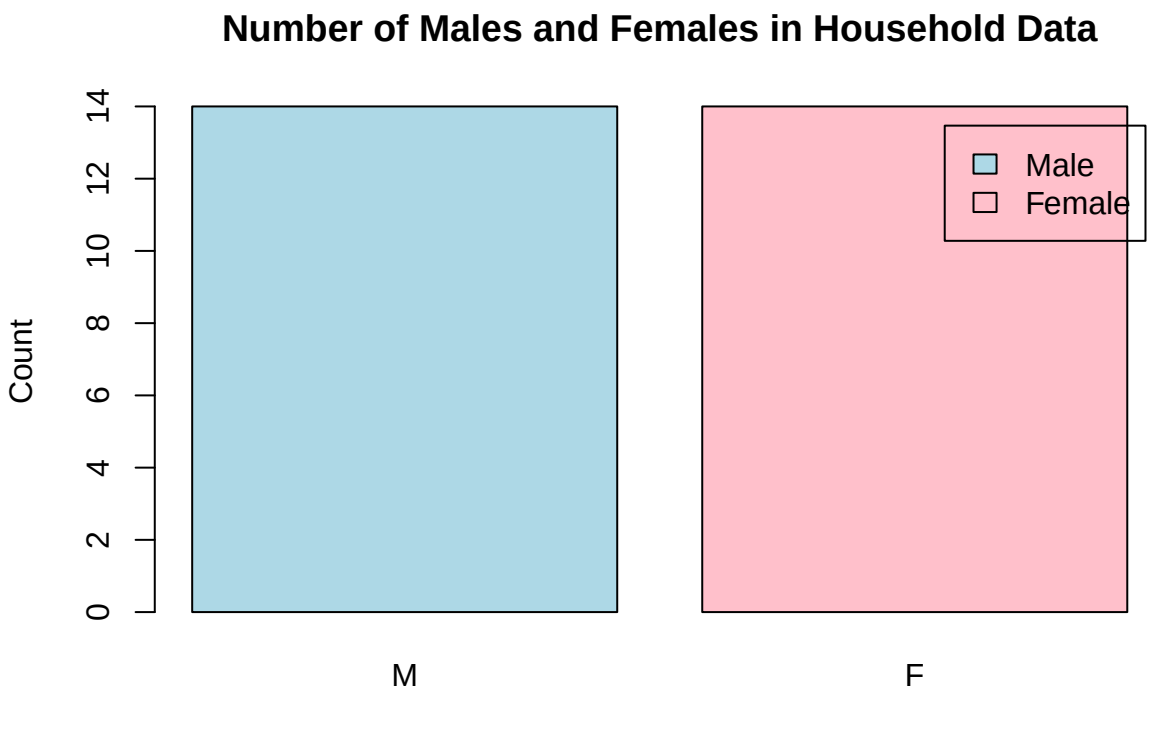
```
## Number of observations in Male: 14
```

```
cat("Number of observations in Female:", female_count, "\n")
```

```
## Number of observations in Female: 14
```

```
#4.c
gender_counts <- c(male_count, female_count)
names(gender_counts) <- c("M", "F")

barplot(gender_counts,
        main = "Number of Males and Females in Household Data",
        xlab = "Gender",
        ylab = "Count",
        col = c("lightblue", "pink"),
        legend = c("Male", "Female"))
```



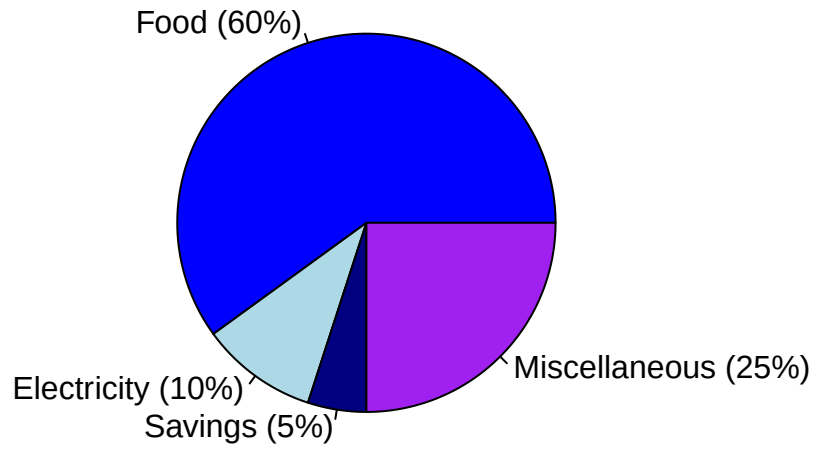

```r
#5
expenses <- c(Food = 60, Electricity = 10, Savings = 5, Miscellaneous = 25)
expense_labels <- names(expenses)

percent_labels <- paste0(expense_labels, " (", round(expenses / sum(expenses) * 100), "%)")

colors <- c("blue", "lightblue", "navy", "purple")

pie(expenses,
    labels = percent_labels,
    main = "Monthly Expenses of the Dela Cruz Family",
    col = colors)
```

Monthly Expenses of the Dela Cruz Family




```r
#6.a
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 ...
```

```r
#6.b
means <- colMeans(iris[, 1:4])

means
```

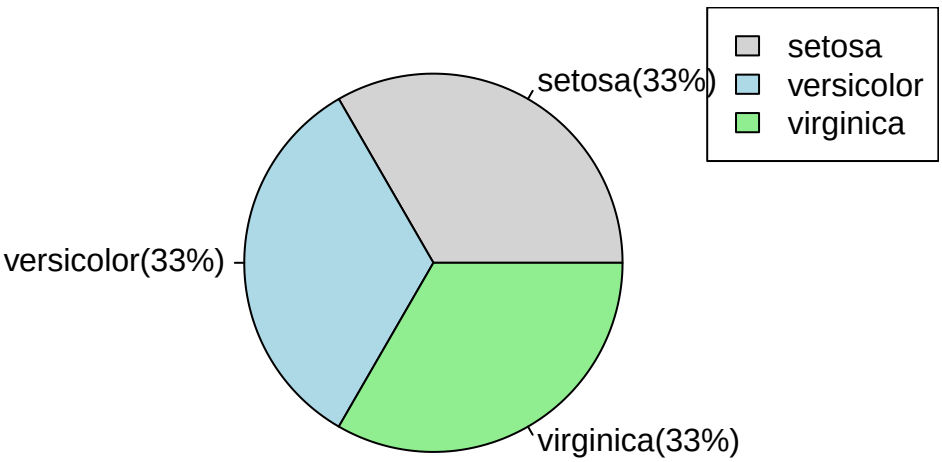
```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##     5.843333     3.057333     3.758000     1.199333
```

```r
#6.c
species_counts <- table(iris$Species)

colors <- c("lightgray", "lightblue", "lightgreen")

pie(species_counts,
    main = "Species Distribution in Iris Dataset",
    col = colors,
    labels = paste(names(species_counts),
                   "(", round(species_counts / sum(species_counts) * 100), "%)", sep = ""))

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




```
#6.d
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:
```

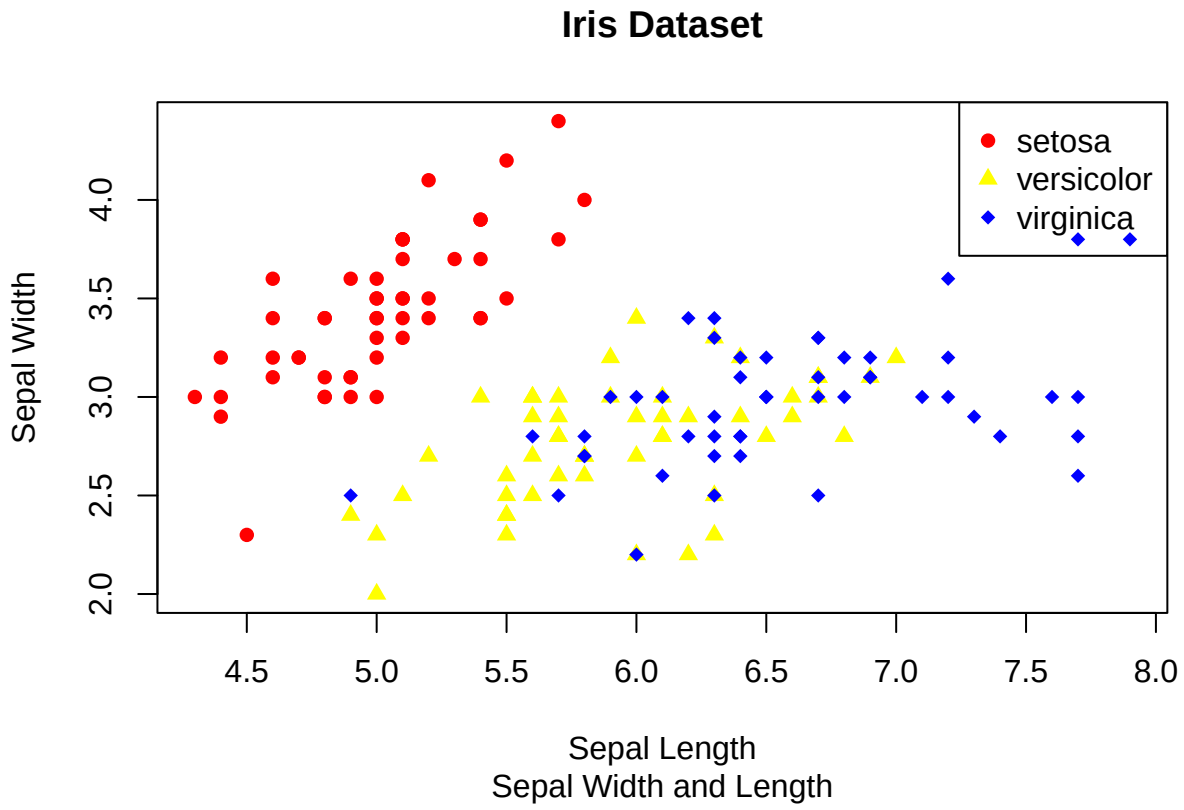
```r
tail(virginica)
```

```
##     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
```

```r
#6.e
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("red", "yellow", "blue")[iris$Species],
     pch = c(16, 17, 18)[iris$Species])

# Add legend
legend("topright", legend = levels(iris$Species),
       col = c("red", "yellow", "blue"), pch = c(16, 17, 18))
```



#6.f

In the iris dataset, the Sepal.Length versus Sepal.Width scatterplot displays separate groups for the setosa, versicolor, and virginica species. Setosa may be easily distinguished from the other species by its smaller sepal

measures, which often have lower values for both length and width. While Virginica has the biggest sepal dimensions, especially in terms of length, Versicolor falls in the middle, with average sepal diameters. Because each species tends to cluster within particular ranges of these measurements, showing natural groupings based on sepal size, this separation shows that Sepal.Length and Sepal.Width are good criteria for categorizing the species.

```
#7.a
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.")
}
```

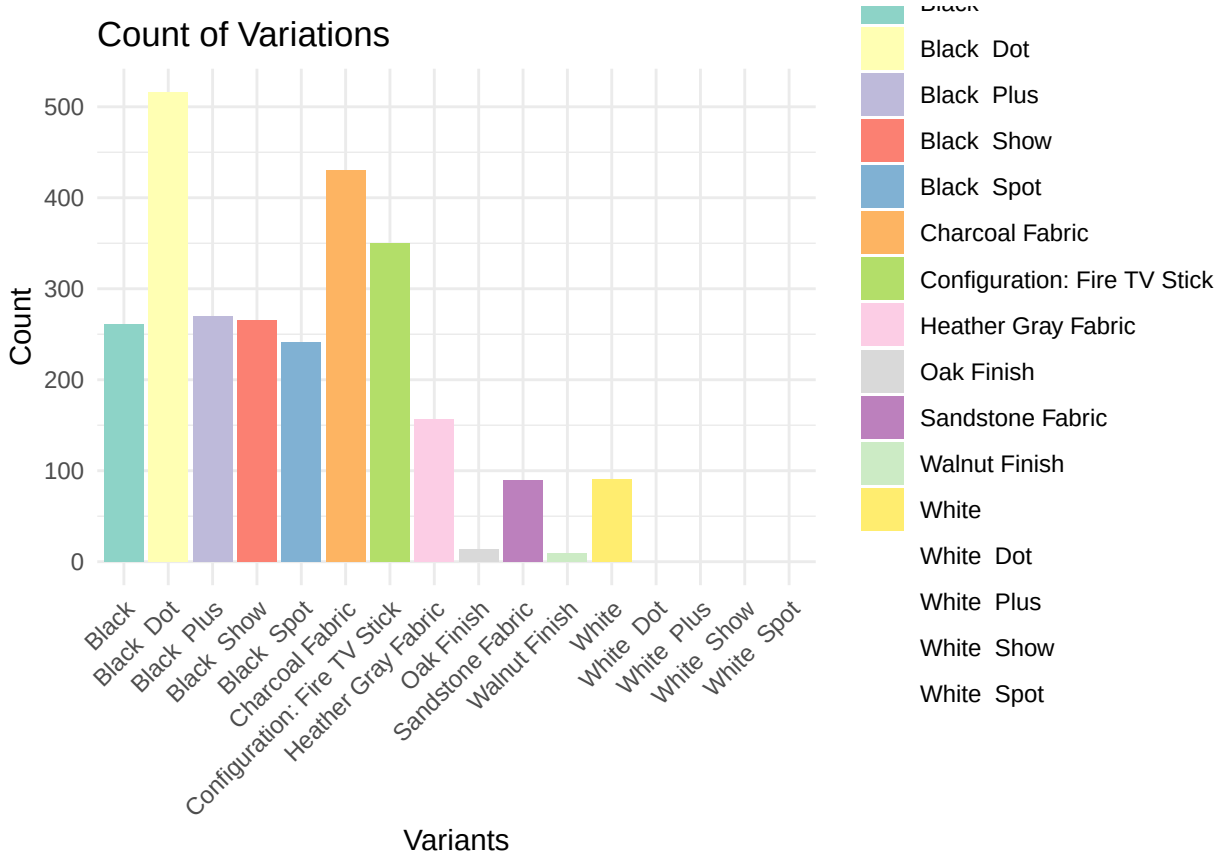
```
## # A tibble: 16 x 2
##    Variant                          n
##    <chr>                        <int>
##  1 Black                          261
##  2 Black  Dot                     516
##  3 Black  Plus                    270
##  4 Black  Show                    265
##  5 Black  Spot           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




```r
#7.d
library(gapminder)
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" = "gray")) +
```

```
  theme(axis.text.x = element_text(angle = 0, hjust = 0.5))
```