RWorksheet4b in R

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###1.

```
vectorA <- c(1:5)
matrix5x5 <- matrix(0, nrow = 5, ncol = 5)

for (i in 1:5) {
  for (j in 1:5) {
    matrix5x5[i,j] <- abs(i - j)
  }
}

print(matrix5x5)
```

```
##      [,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), sep = "", "\n")
}
```

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

###3.

```
a <- 0
b <- 1

cat(a, ", ", sep = "")
```

```
## 0,
```

```r
repeat {
  cat(b, ", ", sep = "")
  next_val <- a + b
  a <- b
  b <- next_val

  if (b > 500) {
    break
  }
}
```

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

###4.

```r
table <- read.csv("shoe_data.csv")

print(table)
```

```
##    Shoe_Size Shoe_Height gender
## 1        6.5        66.0   Male
## 2        9.0        68.0   Male
## 3        8.5        64.5 Female
## 4        8.5        65.0   Male
## 5       10.5        70.0 Female
## 6        7.5        64.0   Male
## 7        9.5        70.0 Female
## 8        9.0        71.0   Male
## 9       13.0        72.0 Female
## 10       7.5        64.0   Male
## 11      10.5        74.5 Female
## 12       8.5        67.0   Male
## 13      12.0        71.0 Female
## 14      10.5        71.0   Male
## 15      13.0        77.0 Female
## 16      11.5        72.0   Male
## 17       8.5        59.0 Female
## 18       5.0        62.0   Male
## 19      10.0        72.0 Female
## 20       6.5        66.0   Male
## 21       7.5        64.0 Female
## 22       8.5        67.0   Male
## 23      10.5        73.0 Female
## 24       8.5        69.0   Male
## 25      10.5        72.0 Female
## 26      11.0        70.0   Male
## 27       9.0        69.0 Female
## 28      13.0        70.0   Male
```

```r
#A.
head(table)
```

```
##   Shoe_Size Shoe_Height gender
## 1       6.5        66.0   Male
## 2       9.0        68.0   Male
## 3       8.5        64.5 Female
## 4       8.5        65.0   Male
## 5      10.5        70.0 Female
## 6       7.5        64.0   Male
```

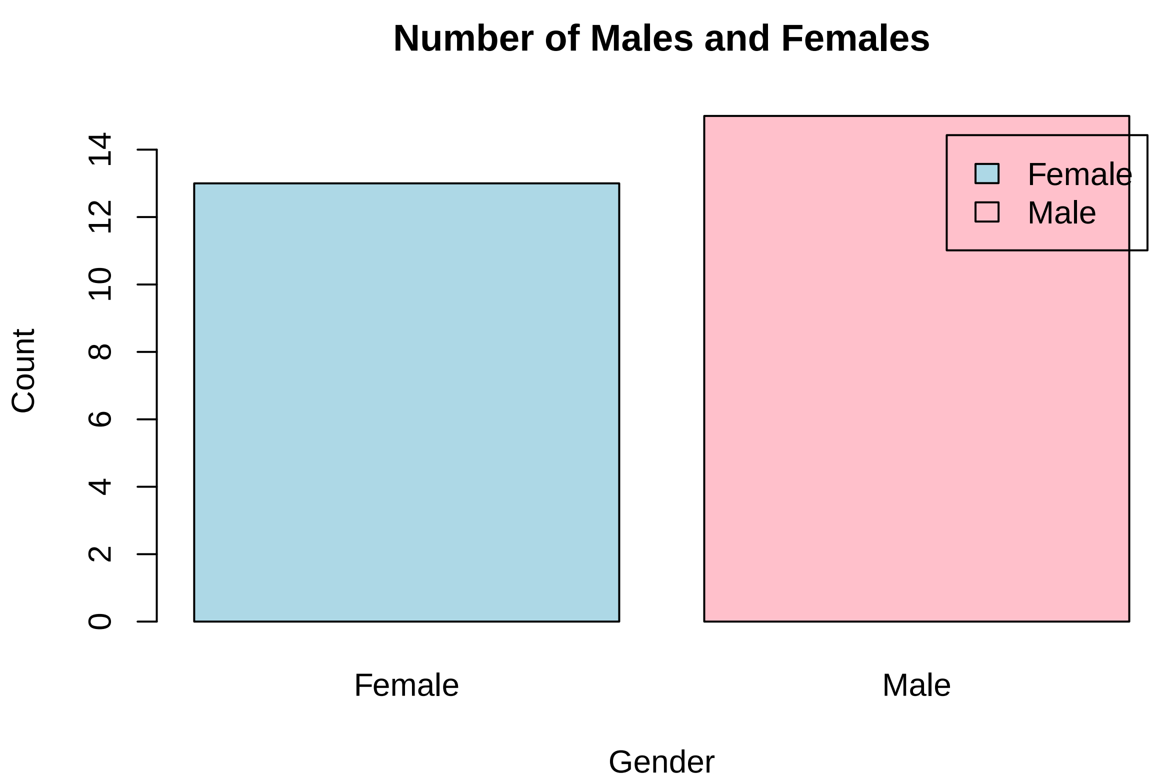
```
#B.
males <- subset(table, gender == "Male")
females <- subset(table, gender == "Female")

nrow(males)
```

```
## [1] 15
```

```
nrow(females)
```

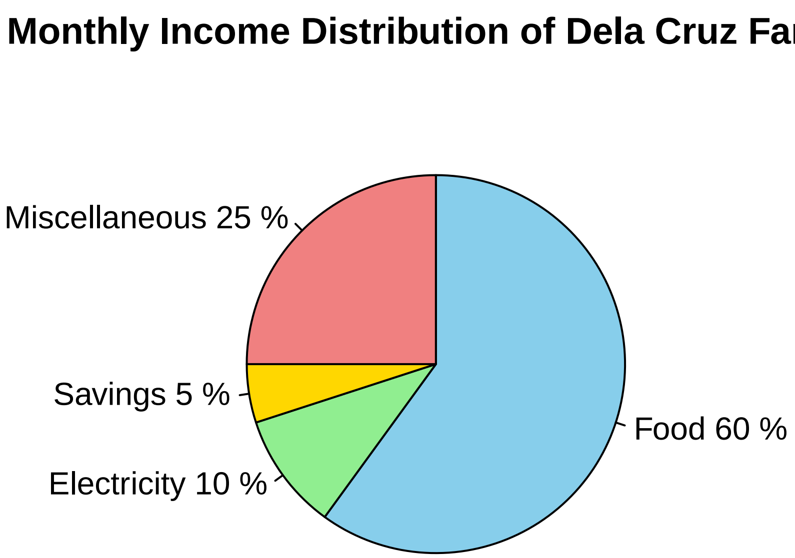
```
## [1] 13
```

```
#C.
gender_count <- table(table$gender)

barplot(gender_count,
        main = "Number of Males and Females",
        xlab = "Gender",
        ylab = "Count",
        col = c("lightblue", "pink"),
        legend.text = TRUE)
```



###5.

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

labels <- paste(names(expenses), expenses, "%", sep = " ")

pie(expenses,
    labels = labels,
    col = c("skyblue", "lightgreen", "gold", "lightcoral"),
    main = "Monthly Income Distribution of Dela Cruz Family",
    clockwise = TRUE)
```



###6.

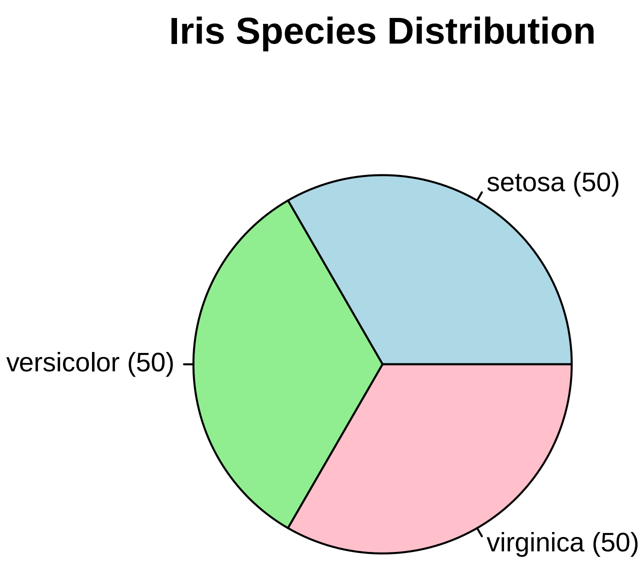
```
data(iris)

#A.
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 ...
```

```
#Datas inside of iris

#B.
iris_means <- c(
  Sepal.Length = mean(iris$Sepal.Length),
  Sepal.Width  = mean(iris$Sepal.Width),
  Petal.Length = mean(iris$Petal.Length),
  Petal.Width  = mean(iris$Petal.Width)
)

iris_means
```

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

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

pie(species_counts,
    main = "Iris Species Distribution",
    col = c("lightblue", "lightgreen", "pink"),
    labels = paste(names(species_counts), " (", species_counts, ")", sep = ""),
    cex = 0.8)

legend("topright", legend = names(species_counts), fill = c("lightblue", "lightgreen", "pink"))
```




```r
#D.
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
```

```r
tail(versicolor)
```

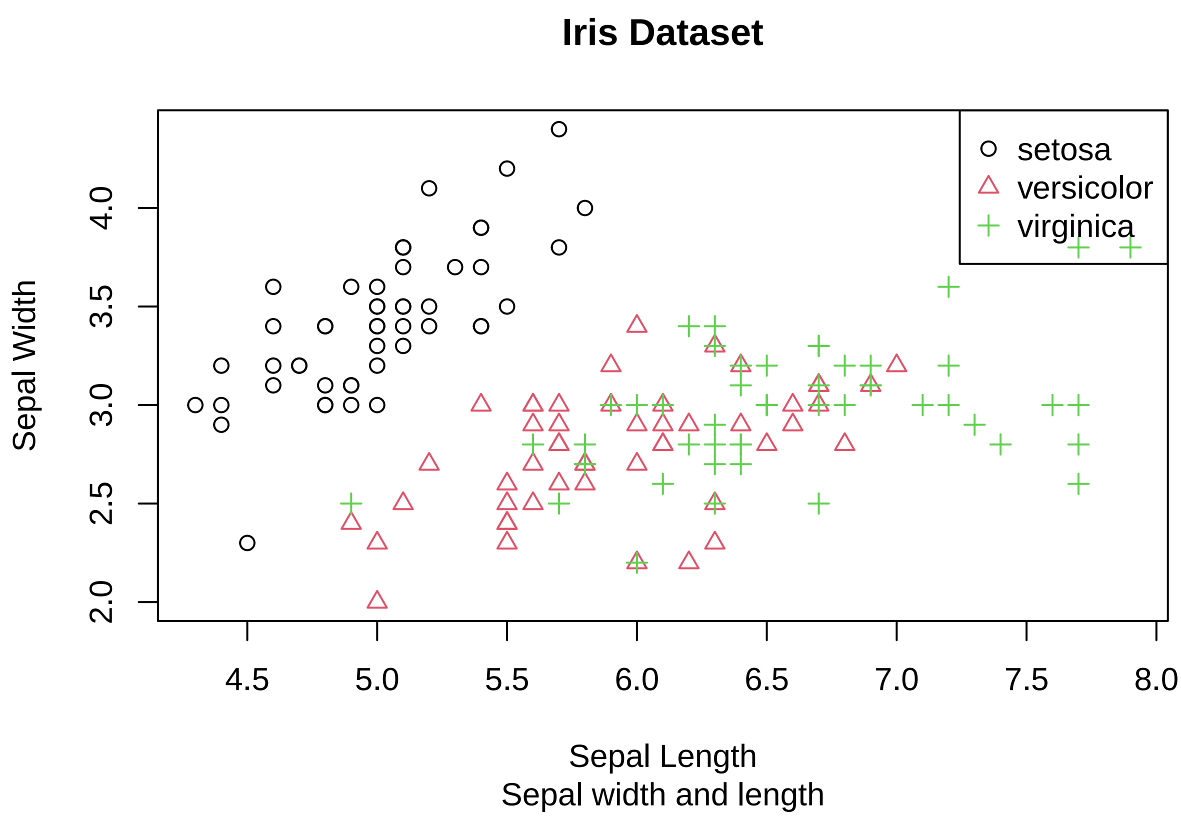
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
```

```
## 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
```

```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
#E.
plot(iris$Sepal.Length, iris$Sepal.Width,
     pch = as.numeric(iris$Species),
     col = as.numeric(iris$Species),
     xlab = "Sepal Length", ylab = "Sepal Width",
     main = "Iris Dataset", sub = "Sepal width and length")

legend("topright", legend = levels(iris$Species),
       pch = 1:3, col = 1:3)
```



```r
#F.
#setosa is scattered on the top right of the table and versicolo and virginica is scrambled together
```

###7.

```r
library(readxl)

data <- read_excel("alexa-file.xlsx")

print(data)
```

```
## # A tibble: 5 x 5
##   rating date       variation    verified_reviews                       feedback
##    <dbl> <chr>      <chr>        <chr>                                     <dbl>
## 1      5 2018-07-30 Black  Dot   It works great!!                              1
## 2      5 2018-07-30 Black Dot    PHENOMENAL                                    1
## 3      5 2018-07-30 Black   Dot  I used it to control my smart home de~        1
## 4      5 2018-07-30 White  Dot   Very convenient                               1
## 5      5 2018-07-30 White   Plus NA                                            1
```

```r
#A.
data$variation <- gsub("\\s+", " ", trimws(data$variation))

data$variation <- gsub("Black ", "Black", data$variation)
data$variation <- gsub("White ", "White", data$variation)

knitr::include_graphics("autumn-flowers-22122594.jpeg")
```

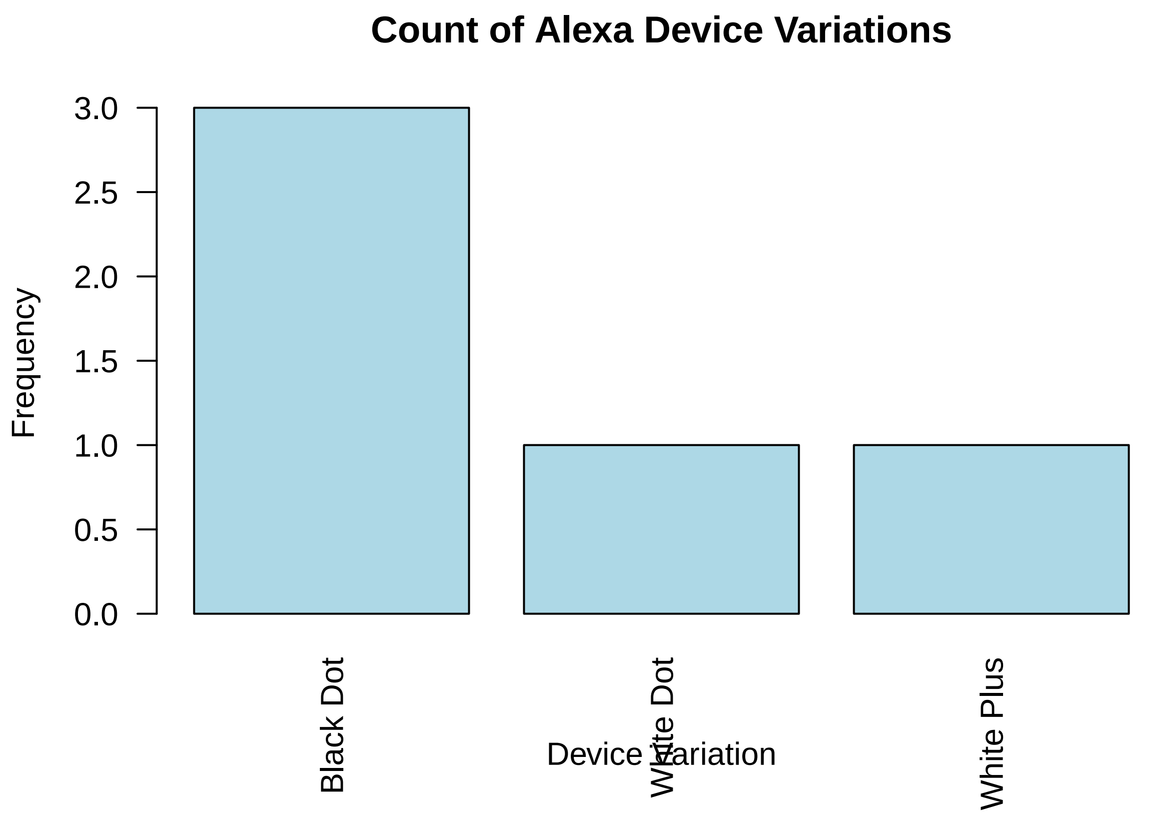
```r
#B.
library(dplyr)
```

```
##
## 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
data <- read_excel("alexa-file.xlsx")

data$variation <- gsub("\\s+", " ", trimws(data$variation))

variations <- data %>%
  count(variation, name = "count")

save(variations, file = "variations.RData")

print(variations)
```

```
## # A tibble: 3 x 2
##   variation  count
##   <chr>      <int>
## 1 Black Dot      3
## 2 White Dot      1
## 3 White Plus     1
```

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

barplot(variations$count,
        names.arg = variations$variation,
        main = "Count of Alexa Device Variations",
        xlab = "Device Variation",
        ylab = "Frequency",
        col = "lightblue",
        las = 2)
```




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

black_variations <- subset(variations, grepl("Black", variation))
white_variations <- subset(variations, grepl("White", variation))

black_total <- sum(black_variations$count)
white_total <- sum(white_variations$count)

barplot(c(Black = black_total, White = white_total),
```

```
        main = "Black vs White Alexa Variations",
        xlab = "Variation Type",
        ylab = "Total Count",
        col = c("black", "white"),
        legend.text = TRUE)
```