RWorksheet_#4BGanon

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r Sys.Date()

1.

```
vectorA = c(1,2,3,4,5)

matrixA <- matrix(0, nrow = 5, ncol = 5)
for (i in 1:5) {
  for (j in 1:5) {
    matrixA[i, j] <- abs(vectorA[i] - vectorA[j])
  }
}
print(matrixA)
```

```
##      [,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("*", 1 * i- 0), "\n")
}
```

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

3.

```
user_input <- 41
num2 <- 0
repeat {
  sum <- user_input + num2
  if (sum > 500) {
    break
  }
  cat(sum, " ")
  user_input <- num2
  num2 <- sum
}
```

```
## 41  41  82  123  205  328
```

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

4.

```
housedata <- read.csv("HouseData.csv")
housedata
```

```
##    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
## 7        9.5   70.0      F
## 8        9.0   71.0      F
## 9       13.0   72.0      M
## 10       7.5   64.0      F
## 11      10.5   74.5      M
## 12       8.5   67.0      F
## 13      12.0   71.0      M
## 14      10.5   71.0      M
## 15      13.0   77.0      M
## 16      11.5   72.0      M
## 17       8.5   59.0      F
## 18       5.0   62.0      F
## 19      10.0   72.0      M
## 20       6.5   66.0      F
## 21       7.5   64.0      F
## 22       8.5   67.0      M
## 23      10.5   73.0      M
## 24       8.5   69.0      F
## 25      10.5   72.0      M
## 26      11.0   70.0      M
## 27       9.0   69.0      M
## 28      13.0   70.0      M
```

```
head(housedata)
```

```
##   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
```

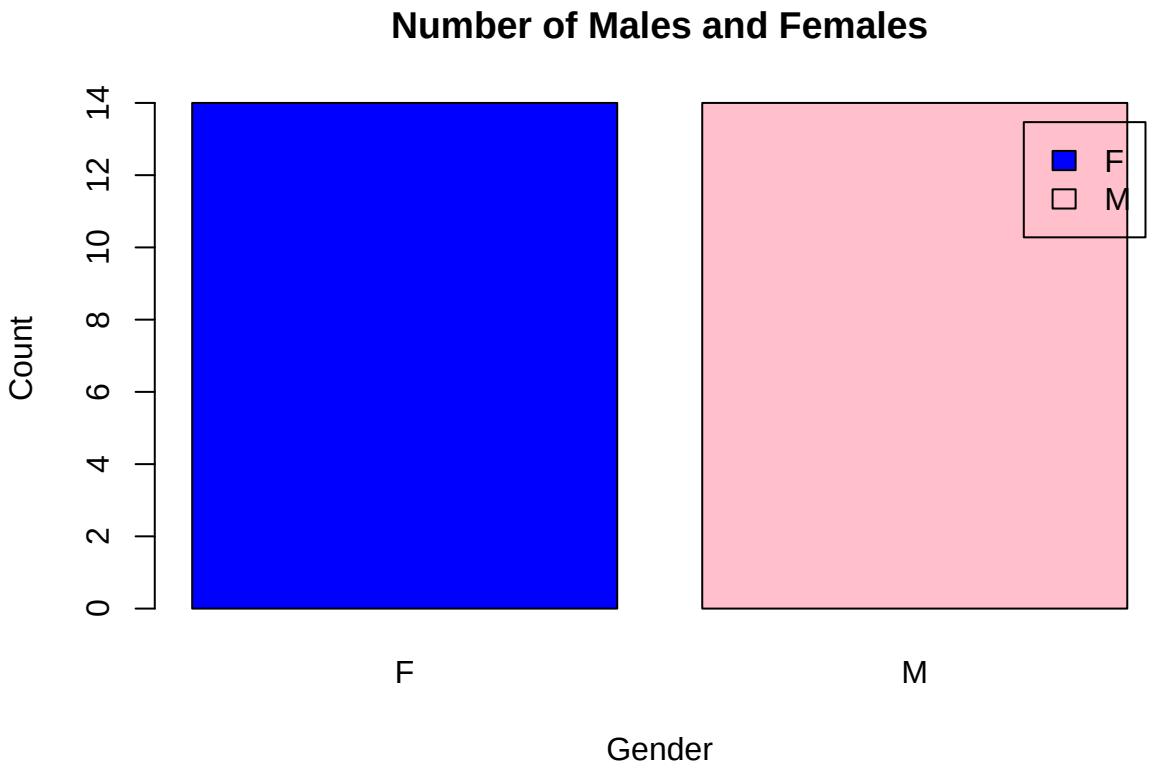
```
#b
males <- subset(housedata, Gender == "M")
females <- subset(housedata, Gender == "F")

num_males <- nrow(males)
num_females <- nrow(females)

cat("Number of males:", num_males, "\n")
```

```
## Number of males: 14
```

```
cat("Number of females:", num_females, "\n")
```

```
## Number of females: 14
```

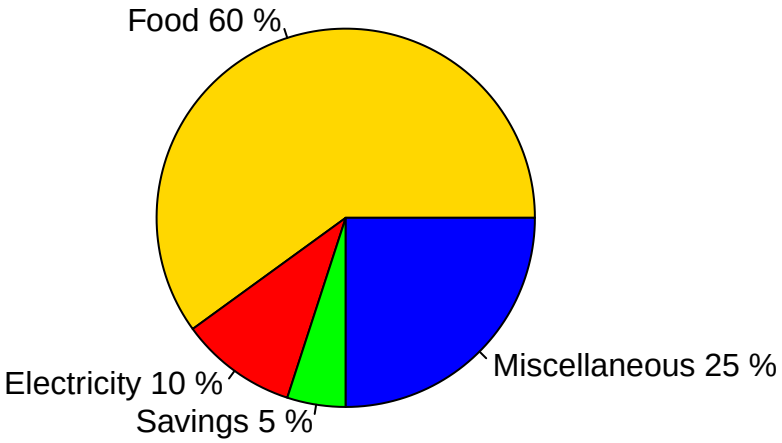
```
#4.c
gender_counts <- table(housedata$Gender)

barplot(gender_counts,
        main = "Number of Males and Females",
        xlab = "Gender",
        ylab = "Count",
        col = c("blue", "pink"),
        legend = names(gender_counts))
```



5.

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

percentages <- round(expense / sum(expense) * 100, 1)

pie(expense,
    labels = paste(labels, percentages, "%"), main = "Monthly Expenses of Dela Cruz Family",
    col = c("gold", "red", "green", "blue")
)
```

Monthly Expenses of Dela Cruz Family



6.

```
data(iris)

#6a.
str(iris)
```

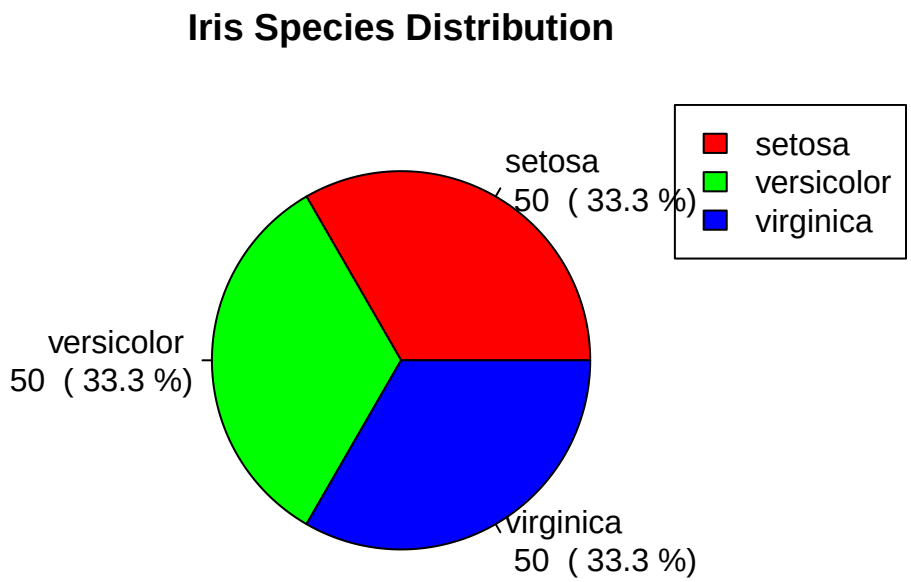
```
## 'data.frame':    150 obs. of  5 variables:
##  $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
##  $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
##  $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
##  $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
##  $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
```

```
# Output description: The iris dataset is a data frame with 150 observations and 5 variables.
# The variables are:
# Species: Factor with 3 levels "setosa", "versicolor", and "virginica"
# Sepal.Length: numeric, representing the sepal length in centimeters
# Sepal.Width: numeric, representing the sepal width in centimeters
# Petal.Length: numeric, representing the petal length in centimeters
# Petal.Width: numeric, representing the petal width in centimeters

#b.

mean_measurements <- c(
  mean(iris$Sepal.Length),
  mean(iris$Sepal.Width),
  mean(iris$Petal.Length),
  mean(iris$Petal.Width)
)
names(mean_measurements) <- c("Sepal.Length", "Sepal.Width", "Petal.Length", "Petal.Width")
print(mean_measurements)
```

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

```
#c
species_counts <- table(iris$Species)
pie(species_counts,
```

```
    main = "Iris Species Distribution",
    col = c("red", "green", "blue"),
    labels = paste(names(species_counts), "\n", species_counts, " (", round(species_counts / sum(species
)
legend("topright", legend = names(species_counts), fill = c("red", "green", "blue"))
```




```
#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
```

```
tail(versicolor)
```

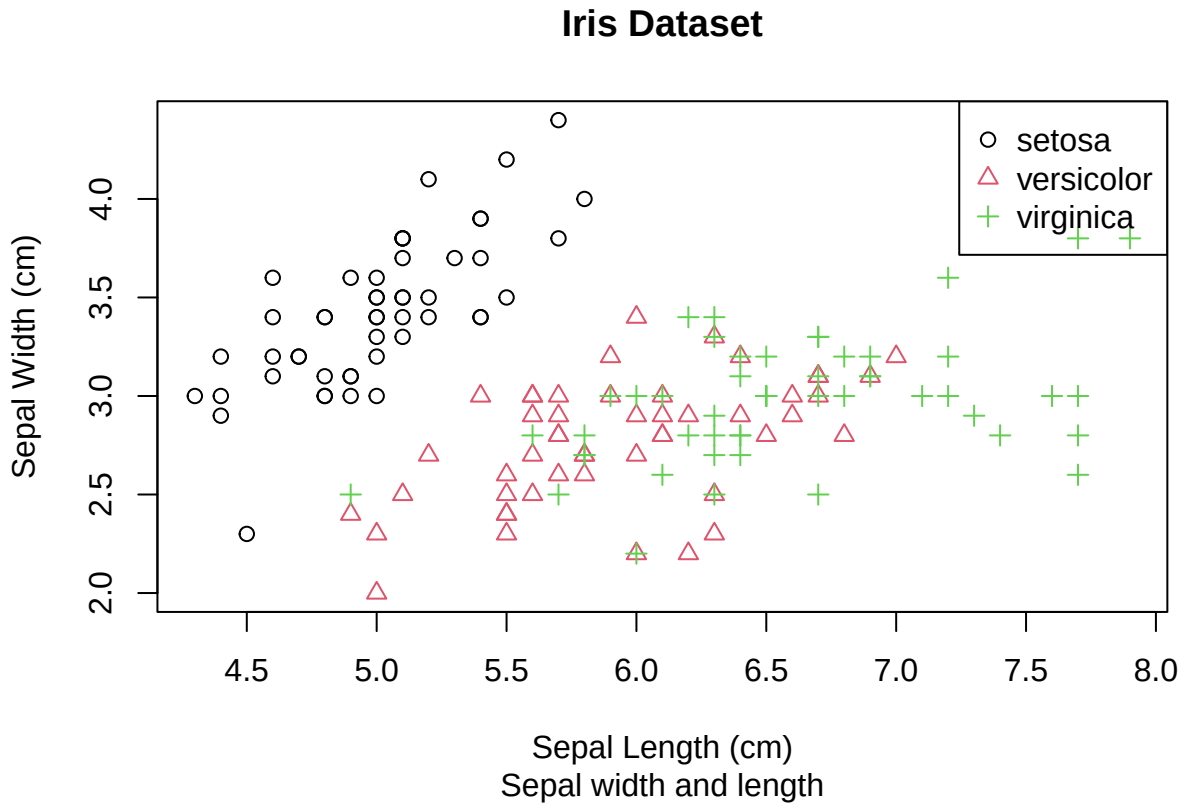
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         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
plot(iris$Sepal.Length, iris$Sepal.Width,
     main = "Iris Dataset",
     sub = "Sepal width and length",
     xlab = "Sepal Length (cm)",
     ylab = "Sepal Width (cm)",
     pch = as.numeric(iris$Species), col = as.numeric(iris$Species)
)
legend("topright", legend = levels(iris$Species), pch = 1:3, col = 1:3)
```




```
#f. The scatterplot illustrates a clear distinction between the three iris species based on sepal lengt
```

```
library(readxl)

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

#7a.

```
unique(alexa_data$variation)
```

```
##  [1] "Charcoal Fabric"           "Walnut Finish"
##  [3] "Heather Gray Fabric"       "Sandstone Fabric"
##  [5] "Oak Finish"                "Black"
##  [7] "White"                     "Black  Spot"
##  [9] "White  Spot"               "Black  Show"
## [11] "White  Show"               "Black  Plus"
## [13] "White  Plus"               "Configuration: Fire TV Stick"
```

```
## [15] "Black  Dot"                    "White  Dot"
```

```
alexa_data$variation <- gsub("Black  Dot", "Black Dot", alexa_data$variation)
alexa_data$variation <- gsub("Black  Plus", "Black Plus", alexa_data$variation)
alexa_data$variation <- gsub("Black  Show", "Black Show", alexa_data$variation)
alexa_data$variation <- gsub("Black  Spot", "Black Spot", alexa_data$variation)

alexa_data$variation <- gsub("White  Dot", "White Dot", alexa_data$variation)
alexa_data$variation <- gsub("White  Plus", "White Plus", alexa_data$variation)
alexa_data$variation <- gsub("White  Show", "White Show", alexa_data$variation)
alexa_data$variation <- gsub("White  Spot", "White Spot", alexa_data$variation)
unique(alexa_data$variation)
```

```
##  [1] "Charcoal Fabric"              "Walnut Finish"
##  [3] "Heather Gray Fabric"          "Sandstone Fabric"
##  [5] "Oak Finish"                   "Black"
##  [7] "White"                        "Black Spot"
##  [9] "White Spot"                   "Black Show"
## [11] "White Show"                   "Black Plus"
## [13] "White Plus"                   "Configuration: Fire TV Stick"
## [15] "Black Dot"                    "White Dot"
```

```
head(alexa_data)
```

```
## # A tibble: 6 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 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
```

```
#7b.
library(dplyr)
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

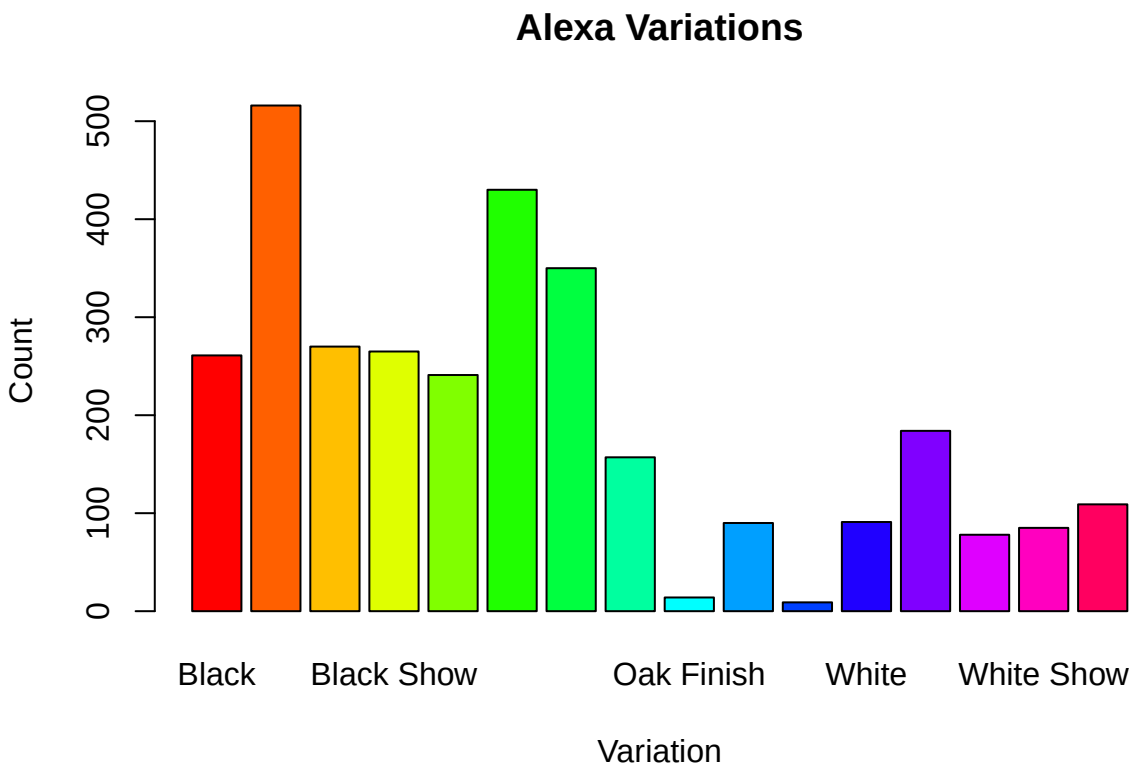
```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
variation_counts <- alexa_data %>% count(variation)
print(variation_counts)
```

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

```r
save(variation_counts, file = "variations.RData")

#7c.
load("variations.RData")

barplot(variation_counts$n,
        names.arg = variation_counts$variation,
        main = "Alexa Variations",
        xlab = "Variation",
        ylab = "Count",
        col = rainbow(nrow(variation_counts))
)
```




```r
#7d.
black_variants <- variation_counts[grepl("Black", variation_counts$variation), ]
white_variants <- variation_counts[grepl("White", variation_counts$variation), ]

par(mfrow = c(1, 2))
```

```r
barplot(black_variants$n,
        names.arg = black_variants$variation,
        main = "Black Variants",
        xlab = "Variation",
        ylab = "Count",
        col = rainbow(nrow(black_variants))
)

barplot(white_variants$n,
        names.arg = white_variants$variation,
        main = "White Variants",
        xlab = "Variation",
        ylab = "Count",
        col = rainbow(nrow(white_variants))
)
```