RWorksheet_Langreo#4b

Kea Joy Langreo

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```
#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[j] - i)
  }
}
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
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:
```

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

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

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

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

```r
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.
```

```r
#4a.
library(readr)
household <- 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
household <- read.csv("sample_data.csv")
head(household)
```

```
##   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
```

```
#4b
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")
```

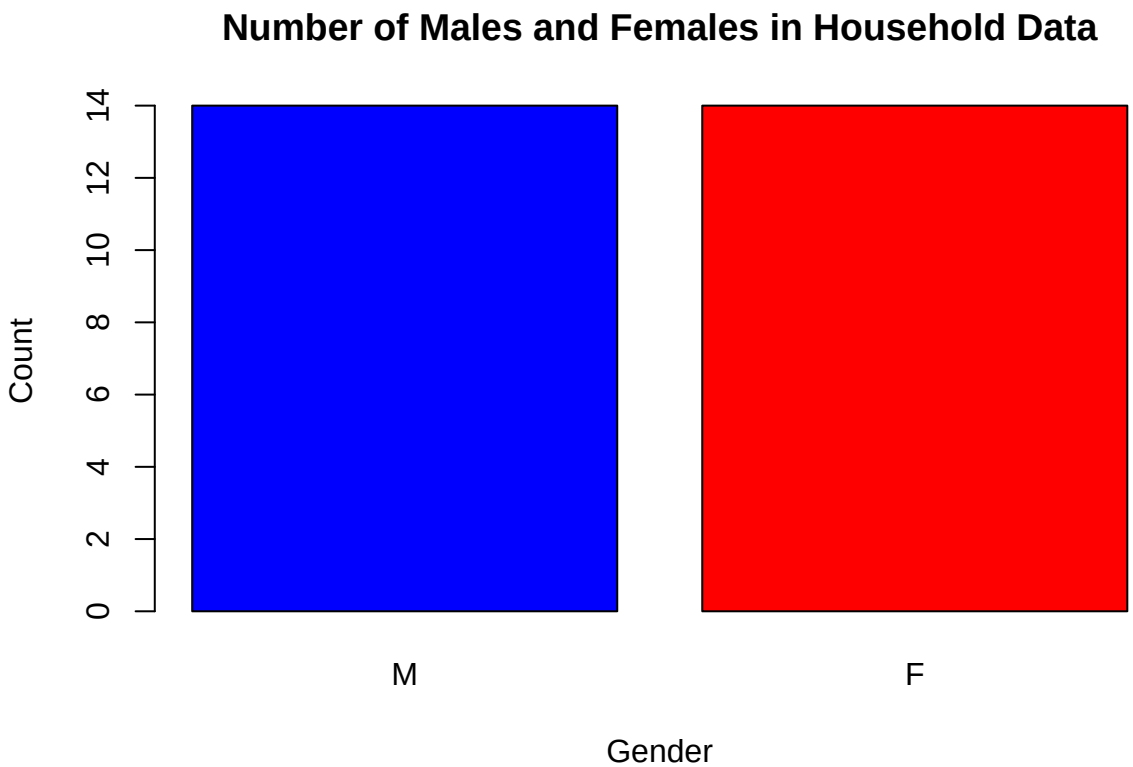
```
## Number of observations in Male: 14
```

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

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

```
#4c
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 =
```



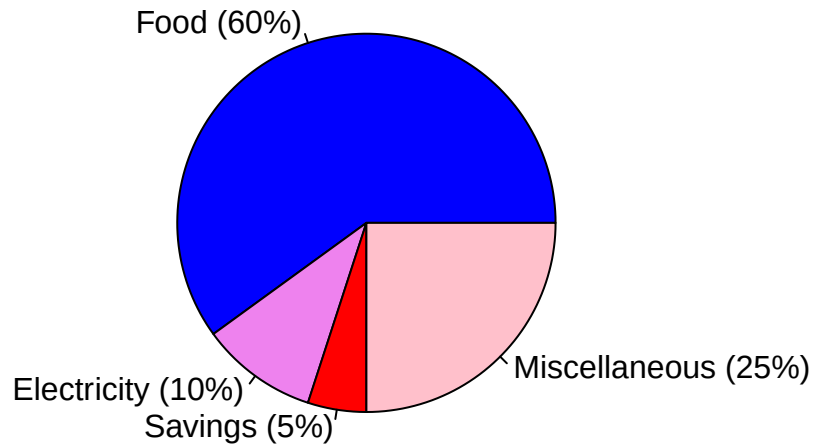

```
#5
expenses <- c(Food = 60, Electricity = 10, Savings = 5, Miscellaneous = 25)
expense_labels <- names(expenses)

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

colors <- c("blue", "violet", "red", "pink")

pie(expenses,
```

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




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

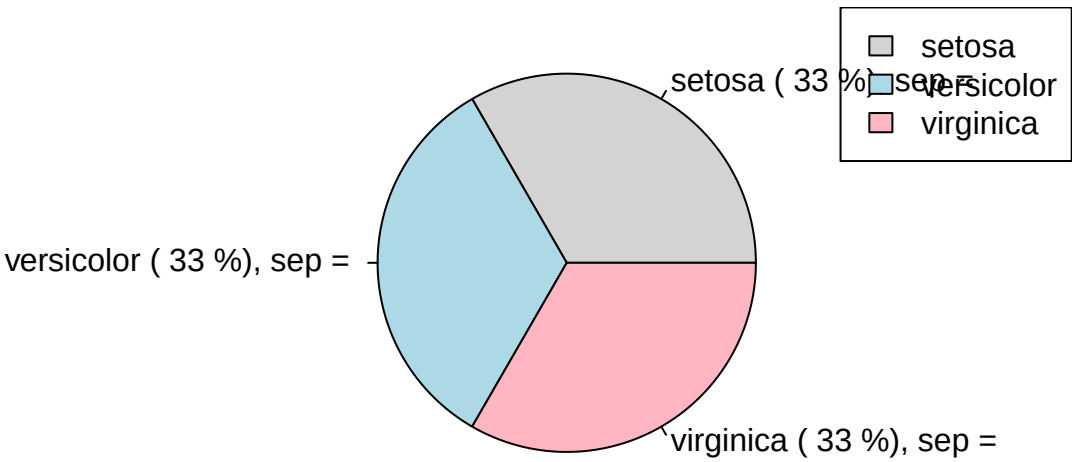
```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##     5.843333     3.057333     3.758000     1.199333
```

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

colors <- c("lightgrey", "lightblue", "lightpink")

pie(species_counts, main ="Species Distribution in Iris Dataset", col = colors, labels = paste(names(sp

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")
```

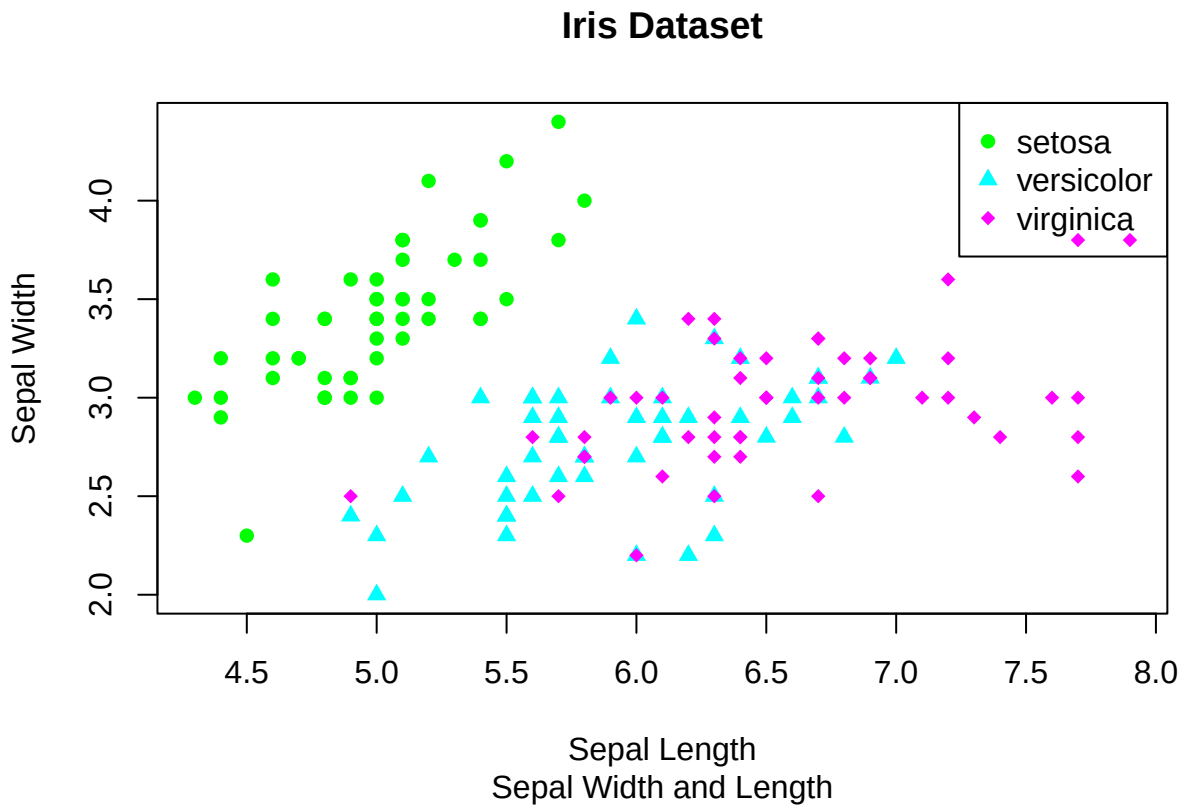
```
##
## Last six rows of Virginica:
```

```
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
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("green", "cyan", "magenta")[iris$Species],
pch = c(16, 17, 18)[iris$Species])

legend("topright", legend = levels(iris$Species),
col = c("green", "cyan", "magenta"), pch = c(16, 17, 18))
```




```r
#6f.
```

```r
#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.")
}
```

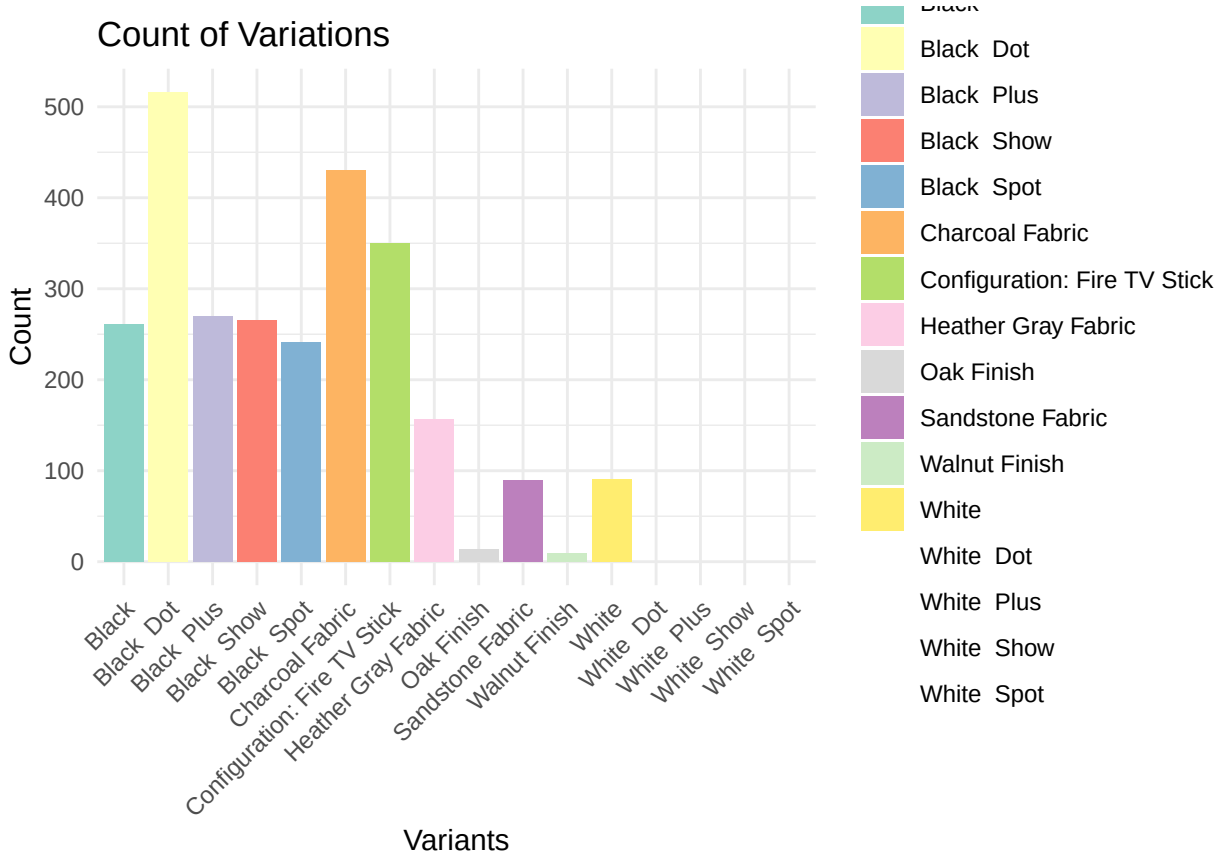
```
## # A tibble: 16 x 2
##    Variant                          n
##    <chr>                        <int>
##  1 Black                          261
##  2 Black  Dot                     516
##  3 Black  Plus                    270
##  4 Black  Show                    265
##  5 Black  Spot           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

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