RWorksheet_Elizalde#4b

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#1.

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

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

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

```
l <- 5

for (i in 1:l){
  for (p in 1:i){
    cat("*")
  }
  cat("\n")
  }
```

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

#3.

```
input <- as.integer(readline(prompt = "Enter the starting number for Fibonacci Sequence: "))
```

```
## Enter the starting number for Fibonacci Sequence:
```

```
a <- 0
b <- 1
```

```
repeat{
  nextnum <- a+b

  if(!is.na(nextnum) > 500){ break
  }
  a <- b
  b <- nextnum

  if(!is.na(nextnum) >= input){
    cat(nextnum, "\n")
  }
}
```

#4. #a.

```
df1 <- read.csv("/cloud/project/Rworksheet4b/HouseholdData.csv")
df1
```

```
##    Respondents    Sex Father.s.Occupation Persons.at.Home Siblings.at.School
## 1            1   Male                   1               5                  2
## 2            2 Female                   2               7                  3
## 3            3 Female                   3               3                  0
## 4            4   Male                   3               8                  5
## 5            5   Male                   1               6                  2
## 6            6 Female                   2               4                  3
## 7            7 Female                   2               4                  1
## 8            8   Male                   3               2                  2
## 9            9 Female                   1              11                  6
## 10          10   Male                   3               6                  2
##    Types.of.Houses
## 1             Wood
## 2         Congrete
## 3         Congrete
## 4             Wood
## 5    Semi-congrete
## 6    Semi-congrete
## 7             Wood
## 8    Semi-congrete
## 9    Semi-congrete
## 10        Congrete
```

```
head(df1, 6)
```

```
##   Respondents    Sex Father.s.Occupation Persons.at.Home Siblings.at.School
## 1           1   Male                   1               5                  2
## 2           2 Female                   2               7                  3
## 3           3 Female                   3               3                  0
## 4           4   Male                   3               8                  5
## 5           5   Male                   1               6                  2
## 6           6 Female                   2               4                  3
##   Types.of.Houses
## 1            Wood
## 2        Congrete
## 3        Congrete
## 4            Wood
```

```
## 5   Semi-congrete
## 6   Semi-congrete
```

#b. Both has 14 observations

```
m <- subset(df1, Sex == "Male")
m
```

```
##    Respondents  Sex Father.s.Occupation Persons.at.Home Siblings.at.School
## 1            1 Male                   1               5                  2
## 4            4 Male                   3               8                  5
## 5            5 Male                   1               6                  2
## 8            8 Male                   3               2                  2
## 10          10 Male                   3               6                  2
##    Types.of.Houses
## 1             Wood
## 4             Wood
## 5    Semi-congrete
## 8    Semi-congrete
## 10        Congrete
```

```
f <- subset(df1, Sex == "Female")
f
```

```
##   Respondents    Sex Father.s.Occupation Persons.at.Home Siblings.at.School
## 2           2 Female                   2               7                  3
## 3           3 Female                   3               3                  0
## 6           6 Female                   2               4                  3
## 7           7 Female                   2               4                  1
## 9           9 Female                   1              11                  6
##   Types.of.Houses
## 2        Congrete
## 3        Congrete
## 6   Semi-congrete
## 7            Wood
## 9   Semi-congrete
```

```
males <- nrow(m)
females <- nrow(f)
cat("Number of observations for Male:", males, "\n")
```

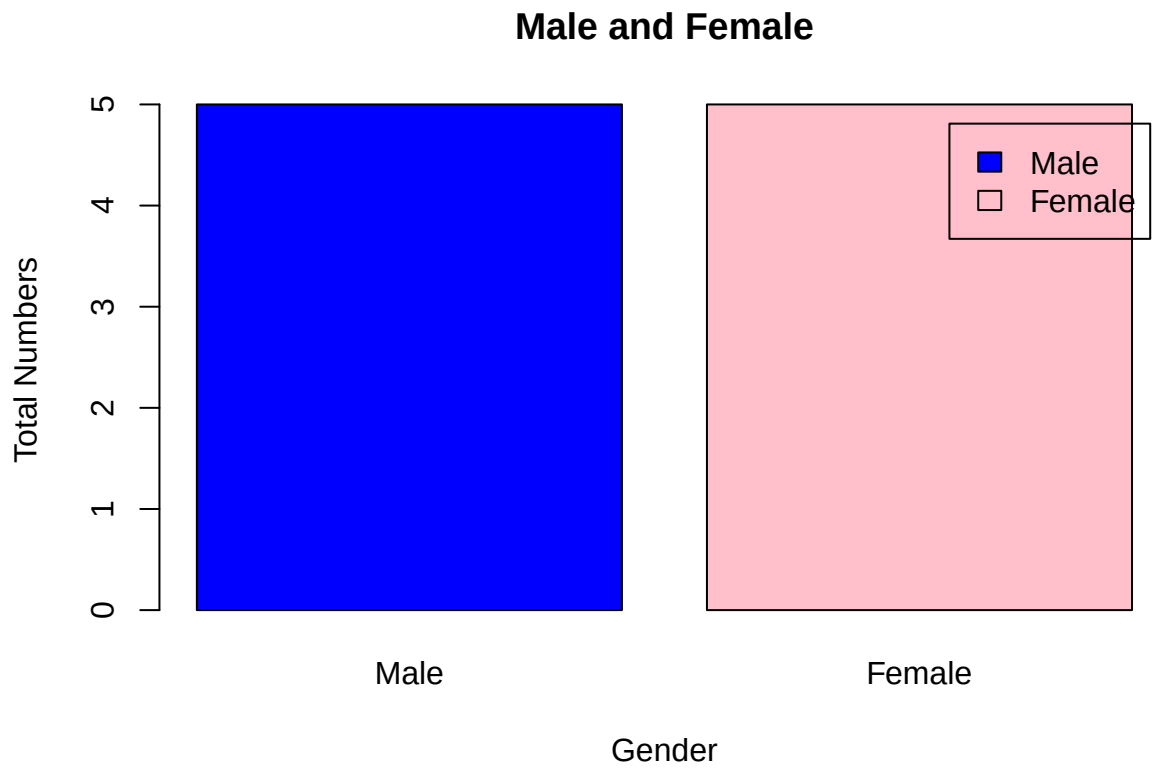
```
## Number of observations for Male: 5
```

```
cat("Number of observations for Female:", females, "\n")
```

```
## Number of observations for Female: 5
```

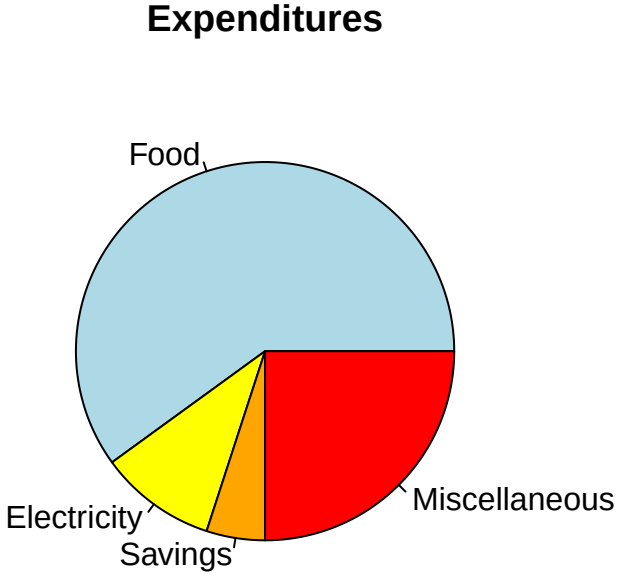
#c.

```
bplot <- c(males,females)
names(bplot) <- c("Male", "Female")
barplot(bplot, main = "Male and Female", xlab = "Gender", ylab = "Total Numbers", col = c("blue", "pink
```



#5.

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


Plotters <- pie(values, labels = c("Food", "Electricity", "Savings", "Miscellaneous"),col = c("lightblu
```



#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 ...
```

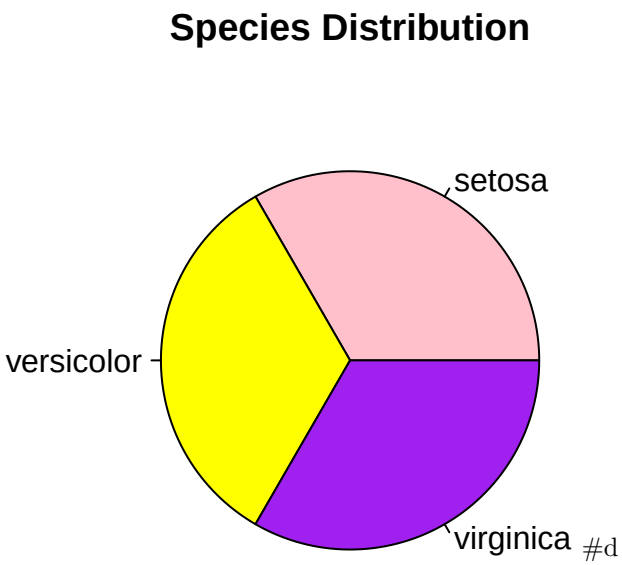
#b.

```
meanI <- colMeans(iris[, 1:4])
meanI
```

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

#c

```
speciesC <- table(iris$Species)
pie(speciesC, main="Species Distribution", col=c("pink", "yellow", "purple"), labels=names(speciesC))
```



#d

```
setosa <- subset(iris, Species == "setosa")
versicolor <- subset(iris, Species == "versicolor")
virginica <- subset(iris, Species == "virginica")
tail(setosa, 6)
```

```
##    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, 6)
```

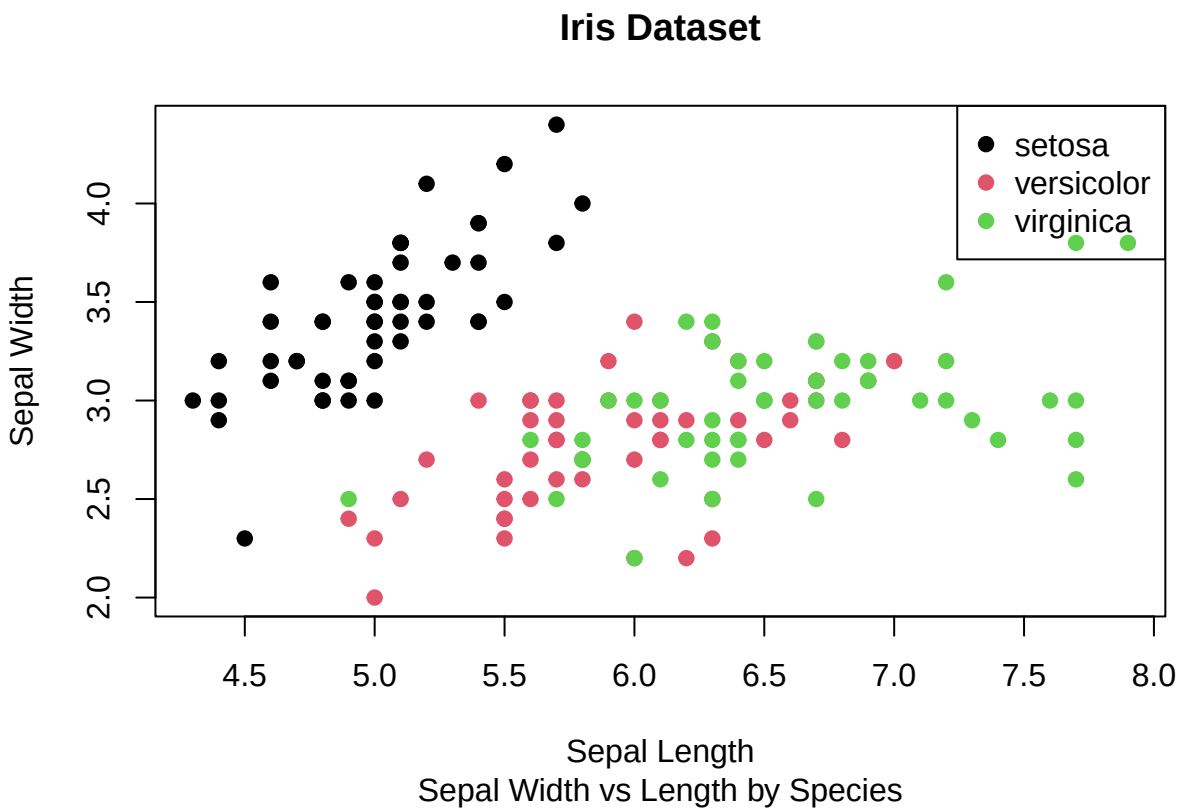
```
##     Sepal.Length Sepal.Width Petal.Length Petal.Width    Species
## 95           5.6         2.7          4.2         1.3 versicolor
## 96           5.7         3.0          4.2         1.2 versicolor
## 97           5.7         2.9          4.2         1.3 versicolor
## 98           6.2         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, 6)
```

```
##     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

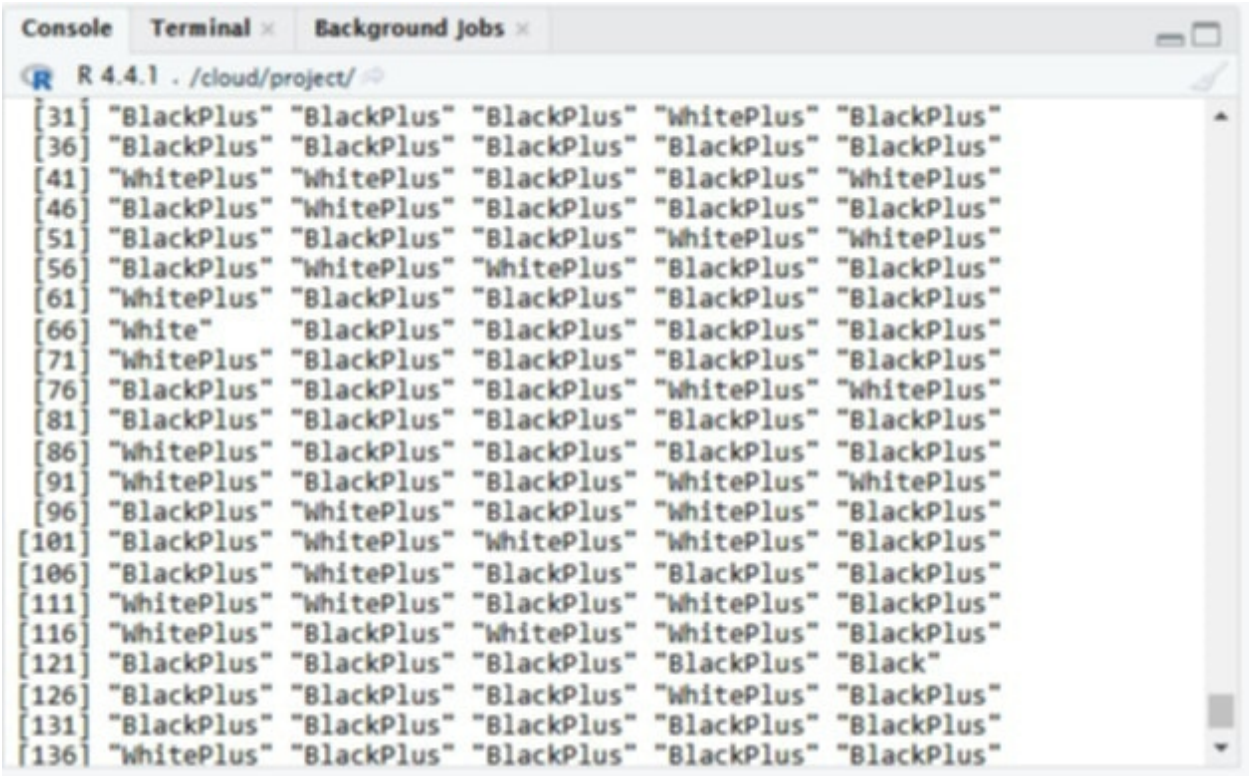
```
plot(iris$Sepal.Length, iris$Sepal.Width, col=iris$Species, pch=19,
main="Iris Dataset", xlab="Sepal Length", ylab="Sepal Width",
sub="Sepal Width vs Length by Species")
legend("topright", legend=levels(iris$Species), col=1:3, pch=19)
```



#f. Based on Sepal Length and Sepal Width, the scatterplot clearly differentiates Setosa from the other two species. The sepals of Setosa form a unique cluster and are notably wider and shorter. Although virginica often has longer sepals, versicolor and virginica overlap more, especially in sepal width. Longer sepals are often narrower, with a little negative association, particularly in virginica. #7. #a.

```
library("openxlsx")
library("readxl")
alexa <- read_excel("/cloud/project/Rworksheet4b/alexa_file.xlsx")

alexa$variation <- gsub("Black  Dot", "BlackDot", alexa$variation)
alexa$variation <- gsub("Black  Plus", "BlackPlus", alexa$variation)
alexa$variation <- gsub("Black  Show", "BlackShow", alexa$variation)
alexa$variation <- gsub("Black  Spot", "BlackSpot", alexa$variation)
```

```
alexa$variation <- gsub("White  Dot", "WhiteDot", alexa$variation)
alexa$variation <- gsub("White  Plus", "WhitePlus", alexa$variation)
alexa$variation <- gsub("White  Show", "WhiteShow", alexa$variation)
alexa$variation <- gsub("White  Spot", "WhiteSpot", alexa$variation)

knitr::include_graphics("/cloud/project/Rworksheet4b/SSd.jpg")
```



#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
```

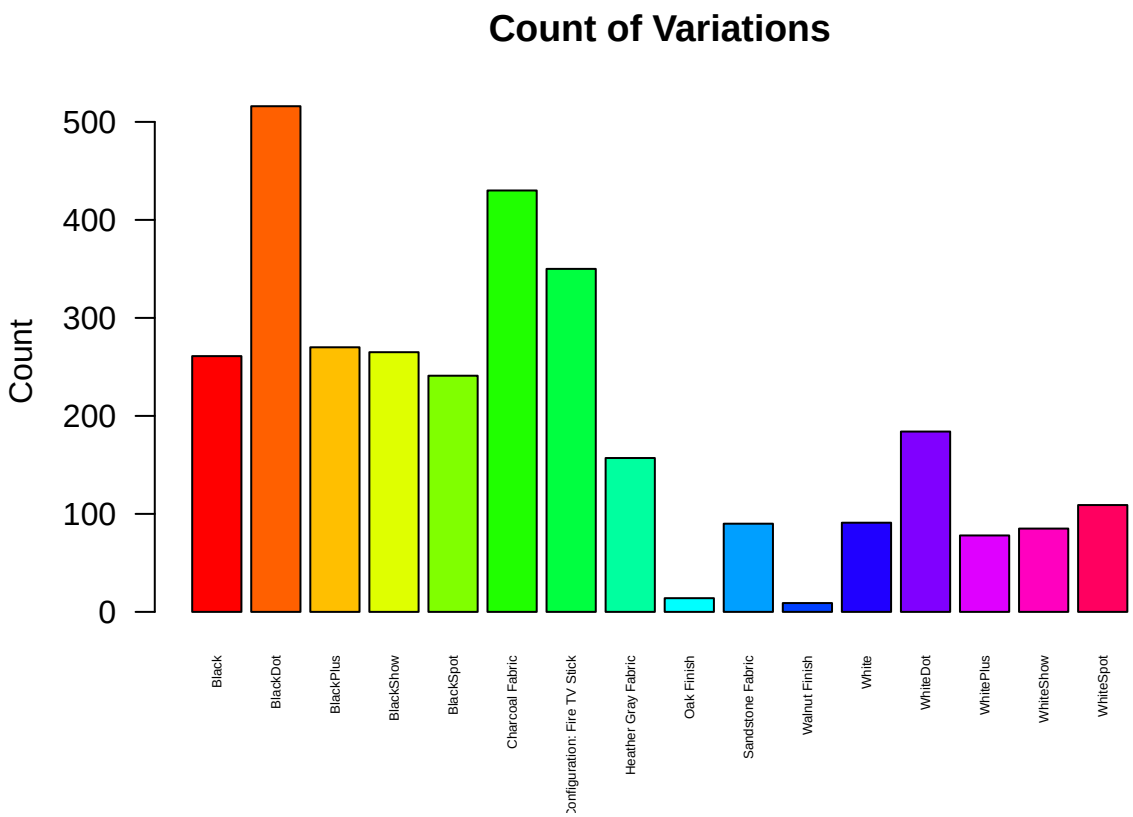
```
variations.RData <- alexa %>%
  count (alexa$variation)

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

```
## # A tibble: 16 x 2
##    `alexa$variation`               n
##    <chr>                       <int>
##  1 Black                         261
```

```
##  2 BlackDot                        516
##  3 BlackPlus                       270
##  4 BlackShow                       265
##  5 BlackSpot                       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 WhiteDot                        184
## 14 WhitePlus                        78
## 15 WhiteShow                        85
## 16 WhiteSpot                       109
```

#c.

```
barplot(
  variations.RData$n,
  names.arg = variations.RData$`alexa$variation`,
  cex.names = 0.4,
  main = "Count of Variations",
  ylab = "Count",
  col = rainbow(length(variations.RData$n)),
  border = "black",
  las = 2
)
```



#d.

```r
library(RColorBrewer)
samps <- brewer.pal(5, "Dark2")

blacks <- variations.RData %>%
  filter(grepl("^Black|^White", `alexa$variation`))
par(mfrow = c(1, 2))
barplot(
  blacks$n[blacks$`alexa$variation` %in% c("Black", "BlackPlus", "BlackShow", "BlackSpot", "BlackDot")]
  names.arg = blacks$`alexa$variation`[blacks$`alexa$variation` %in% c("Black", "BlackPlus", "BlackShow
  las = 3,
  cex.names = 1,
  main = "Black Variations",
  ylab = "Count",
  col = samps,
  border = "black"
)
barplot(
  blacks$n[blacks$`alexa$variation` %in% c("White", "WhitePlus", "WhiteShow", "WhiteSpot", "WhiteDot")]
  names.arg = blacks$`alexa$variation`[blacks$`alexa$variation` %in% c("White", "WhitePlus", "WhiteShow
  las = 2,
  cex.names = 1,
  main = "White Variations",
  ylab = "Count",
  col = c("blue", "green", "yellow", "purple", "pink"),
  border = "black"
)
```