RWorksheet #5

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#1a. Plot the data using a bar graph. Write the codes and copy the result.
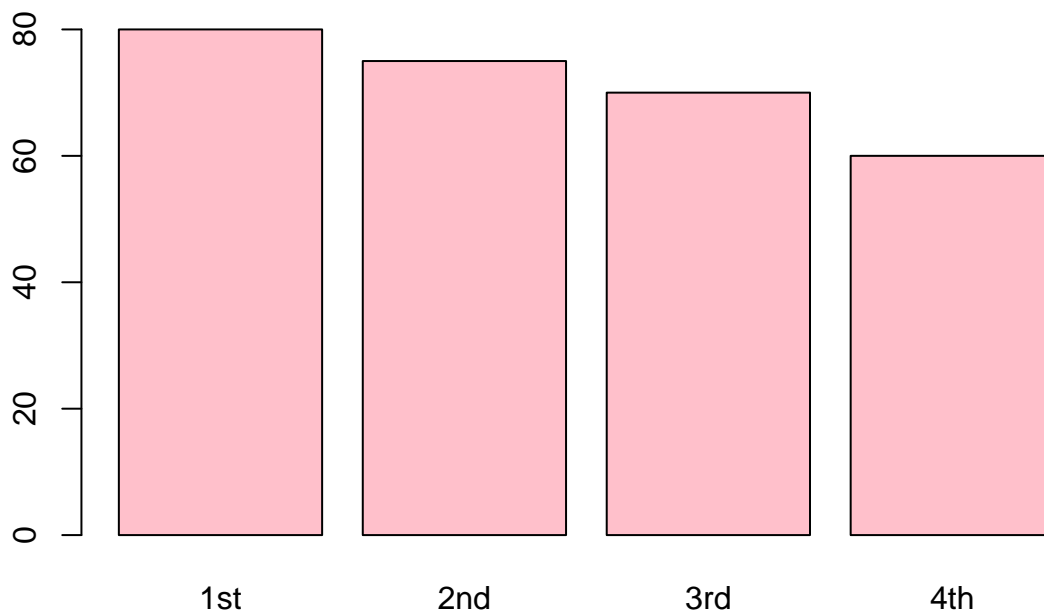
```r
Year <- c("1st", "2nd", "3rd", "4th")
Year
```

```
## [1] "1st" "2nd" "3rd" "4th"
```

```r
numberOfEnrolees <- c(80, 75, 70, 60)
numberOfEnrolees
```

```
## [1] 80 75 70 60
```

```r
barplot(numberOfEnrolees,                          # Add labels to barplot
        names.arg = Year,
        col = "pink")
```

#1b. Using the same table, label the barchart with (1) Title = " Enrollment of BS Computer Science, (2) horizontal axis = "Curriculum Year" and (3) vertical axis = "number of students".

```
barplot(numberOfEnrolees,
        names.arg = Year,
        main = "Enrollment of BS Computer Science",
        xlab = "Curriculum Year",
        ylab = "number of students",
        col = "dark blue"
)
```
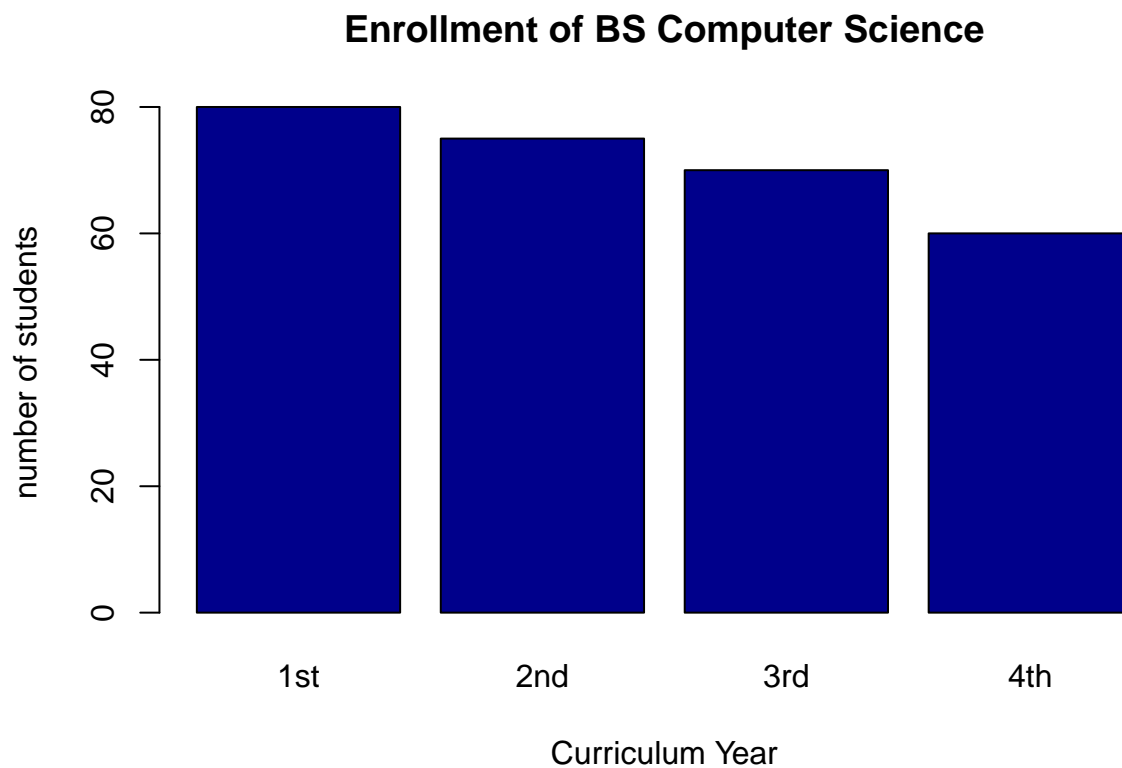

#2a. The monthly income of De Jesus family was spent on the following: #60% on Food, 10% on electricity, 5% for savings, and 25% for other miscellaneous expenses.

#Create a table for the above scenario. Write the codes and its result.

```
expenses <- c("Food", "Electricity", "Savings", "Miscelleneous Expenses")
howMuch <- c(60, 10, 5, 25)

Expenses <- data.frame(
  expenses,
  howMuch
)
Expenses
```

```
##              expenses howMuch
```

```
## 1                  Food      60
## 2          Electricity      10
## 3              Savings       5
## 4 Miscelleneous Expenses     25
```

```
tableExpenses <- table(Expenses)
tableExpenses
```

```
##                        howMuch
## expenses               5 10 25 60
##   Electricity          0  1  0  0
##   Food                 0  0  0  1
##   Miscelleneous Expenses 0  0  1  0
##   Savings              1  0  0  0
```

#2b. Plot the data using a pie chart. Add labels, colors and legend. Write the codes and its result.

```
library(scales)
```

```
## Warning: package 'scales' was built under R version 4.2.2
```

```
equation <- round(howMuch/sum(howMuch) * 1, 2)
percentage <- percent(equation)
percentage
```

```
## [1] "60%" "10%" "5%"  "25%"
```

```
pieData <- pie(howMuch,
               main = "Month Data",
               col = rainbow(4),
               labels = percentage,
               cex = 0.8)
pieData
```

```
## NULL
```

```
legend(1,1,
       c("Food", "Electricity", "Savings", "Miscellaneous expenses"),
       cex = 0.5,
       fill = rainbow(4))
```

Month Data
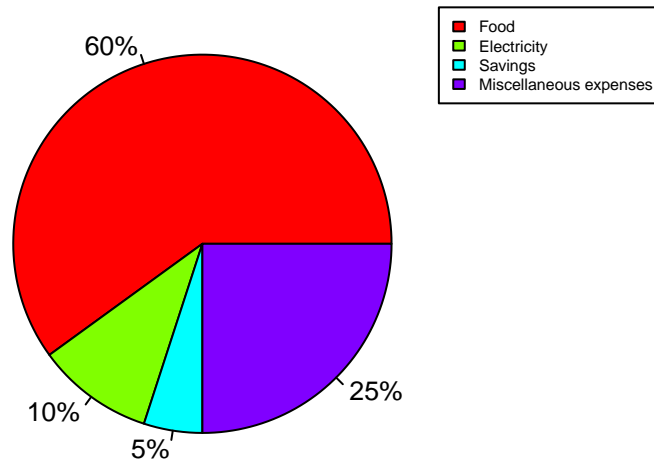
#3a. Open the mtcars dataset.Create a simple histogram specifically for mpg (miles per gallon) variable.Use $ to select the mpg only. Write the codes and its result.

```
data(mtcars)

mpgHistogram <- hist(mtcars$mpg)
```

Histogram of mtcars$mpg
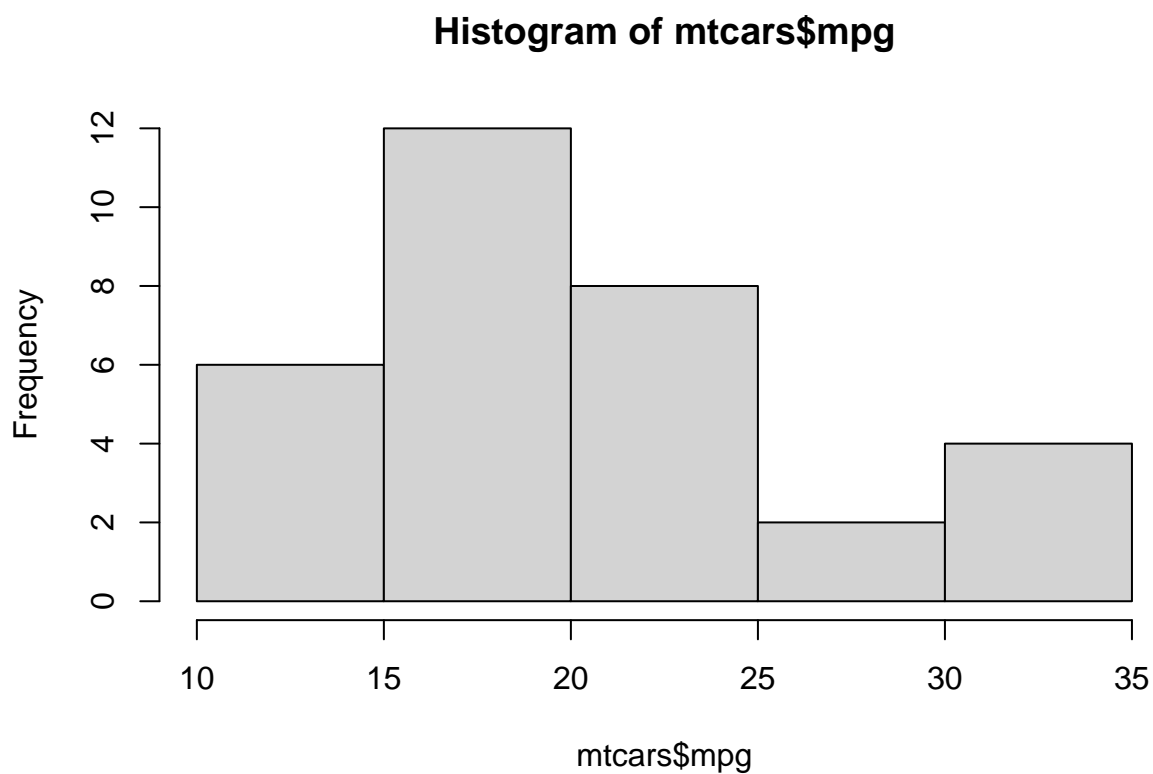

```
mpgHistogram
```

```
## $breaks
## [1] 10 15 20 25 30 35
##
## $counts
## [1]  6 12  8  2  4
##
## $density
## [1] 0.0375 0.0750 0.0500 0.0125 0.0250
##
## $mids
## [1] 12.5 17.5 22.5 27.5 32.5
##
## $xname
## [1] "mtcars$mpg"
##
## $equidist
## [1] TRUE
##
## attr(,"class")
## [1] "histogram"
```

#3b Colored histogram with different number of bins.

```r
hist(mtcars$mpg, breaks=12, col="red")
coloredMpg <- hist(mtcars$mpg, breaks=12, col="red")
```

Histogram of mtcars$mpg
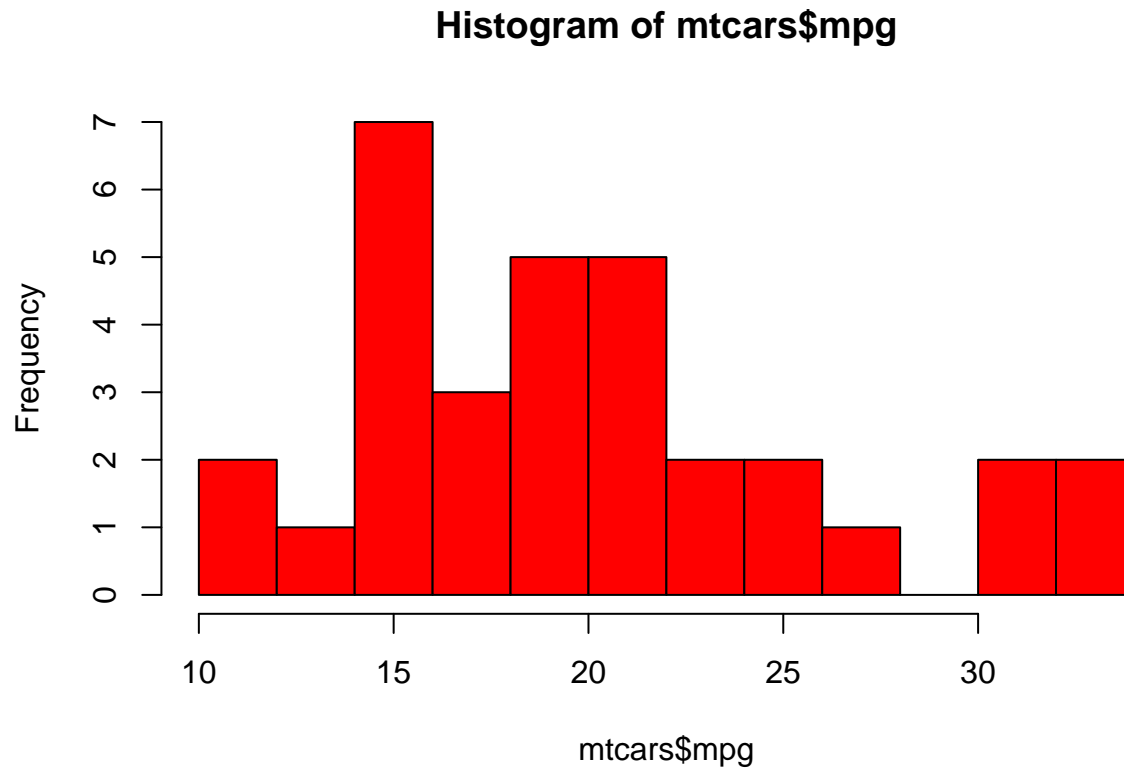

```r
difNumBins <- hist(mtcars$mpg, breaks=7, col="red")
```

Histogram of mtcars$mpg
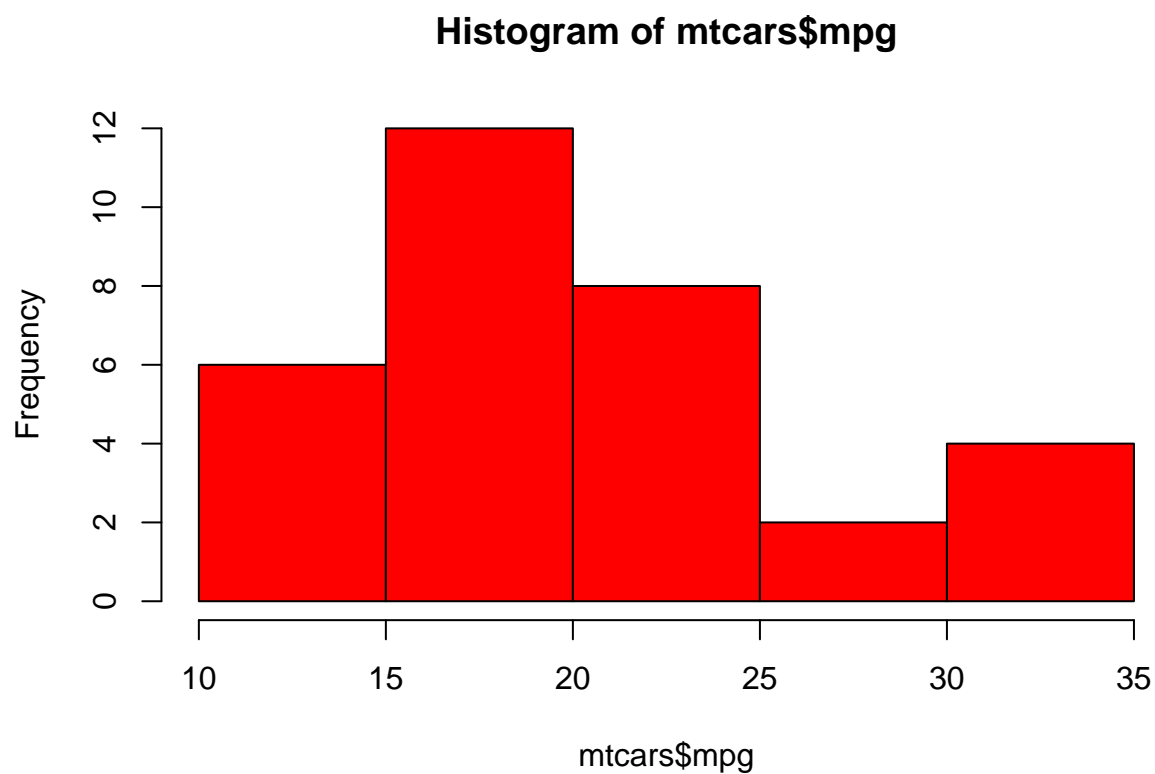
#3c. Adding a Normal Curve

```
x <- mtcars$mpg
h<-hist(x, breaks=10, col="red", xlab="Miles Per Gallon",
        main="Histogram with Normal Curve")
xfit<-seq(min(x),max(x),length=40)
yfit<-dnorm(xfit,mean=mean(x),sd=sd(x))
yfit <- yfit*diff(h$mids[1:2])*length(x)
lines(xfit, yfit, col="blue", lwd=2)
```

Histogram with Normal Curve
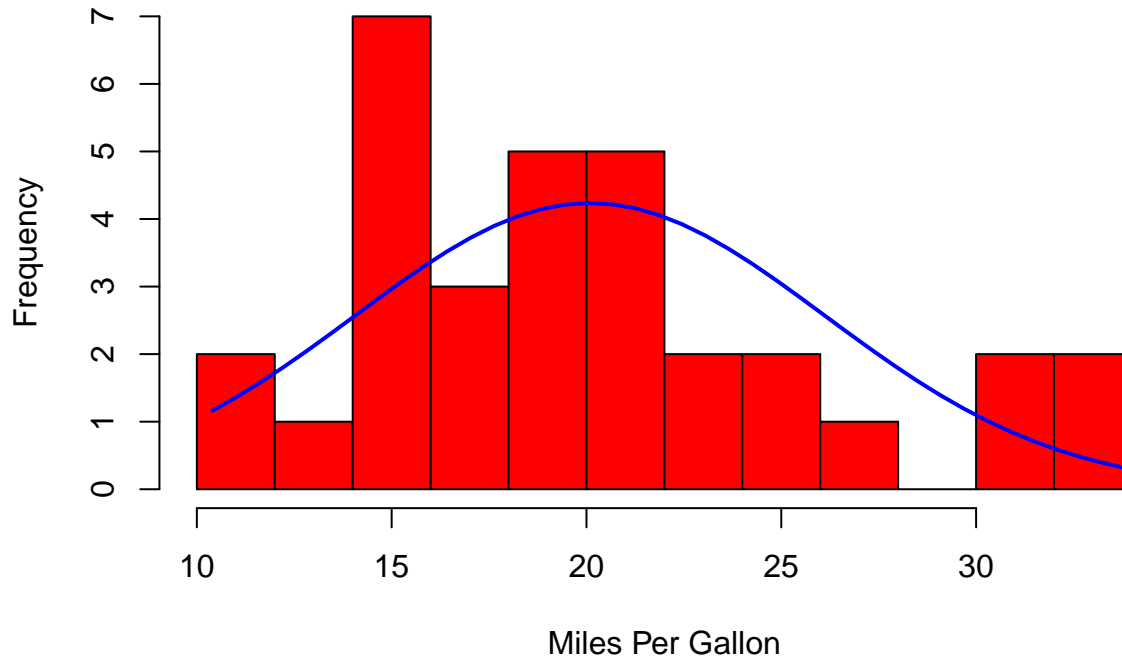
#4a. Open the iris dataset. Create a subset for each species. Write the codes and its result.

```
data("iris")

setosaSubset <- subset(iris, Species == 'setosa' )
setosaSubset
```

```
##    Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1           5.1         3.5          1.4         0.2  setosa
## 2           4.9         3.0          1.4         0.2  setosa
## 3           4.7         3.2          1.3         0.2  setosa
## 4           4.6         3.1          1.5         0.2  setosa
## 5           5.0         3.6          1.4         0.2  setosa
## 6           5.4         3.9          1.7         0.4  setosa
## 7           4.6         3.4          1.4         0.3  setosa
## 8           5.0         3.4          1.5         0.2  setosa
## 9           4.4         2.9          1.4         0.2  setosa
## 10          4.9         3.1          1.5         0.1  setosa
## 11          5.4         3.7          1.5         0.2  setosa
## 12          4.8         3.4          1.6         0.2  setosa
## 13          4.8         3.0          1.4         0.1  setosa
## 14          4.3         3.0          1.1         0.1  setosa
## 15          5.8         4.0          1.2         0.2  setosa
## 16          5.7         4.4          1.5         0.4  setosa
## 17          5.4         3.9          1.3         0.4  setosa
## 18          5.1         3.5          1.4         0.3  setosa
```

```
## 19            5.7           3.8            1.7          0.3    setosa
## 20            5.1           3.8            1.5          0.3    setosa
## 21            5.4           3.4            1.7          0.2    setosa
## 22            5.1           3.7            1.5          0.4    setosa
## 23            4.6           3.6            1.0          0.2    setosa
## 24            5.1           3.3            1.7          0.5    setosa
## 25            4.8           3.4            1.9          0.2    setosa
## 26            5.0           3.0            1.6          0.2    setosa
## 27            5.0           3.4            1.6          0.4    setosa
## 28            5.2           3.5            1.5          0.2    setosa
## 29            5.2           3.4            1.4          0.2    setosa
## 30            4.7           3.2            1.6          0.2    setosa
## 31            4.8           3.1            1.6          0.2    setosa
## 32            5.4           3.4            1.5          0.4    setosa
## 33            5.2           4.1            1.5          0.1    setosa
## 34            5.5           4.2            1.4          0.2    setosa
## 35            4.9           3.1            1.5          0.2    setosa
## 36            5.0           3.2            1.2          0.2    setosa
## 37            5.5           3.5            1.3          0.2    setosa
## 38            4.9           3.6            1.4          0.1    setosa
## 39            4.4           3.0            1.3          0.2    setosa
## 40            5.1           3.4            1.5          0.2    setosa
## 41            5.0           3.5            1.3          0.3    setosa
## 42            4.5           2.3            1.3          0.3    setosa
## 43            4.4           3.2            1.3          0.2    setosa
## 44            5.0           3.5            1.6          0.6    setosa
## 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
versicolorSubset <- subset(iris, Species == 'versicolor' )
versicolorSubset
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width     Species
## 51            7.0           3.2            4.7          1.4 versicolor
## 52            6.4           3.2            4.5          1.5 versicolor
## 53            6.9           3.1            4.9          1.5 versicolor
## 54            5.5           2.3            4.0          1.3 versicolor
## 55            6.5           2.8            4.6          1.5 versicolor
## 56            5.7           2.8            4.5          1.3 versicolor
## 57            6.3           3.3            4.7          1.6 versicolor
## 58            4.9           2.4            3.3          1.0 versicolor
## 59            6.6           2.9            4.6          1.3 versicolor
## 60            5.2           2.7            3.9          1.4 versicolor
## 61            5.0           2.0            3.5          1.0 versicolor
## 62            5.9           3.0            4.2          1.5 versicolor
## 63            6.0           2.2            4.0          1.0 versicolor
## 64            6.1           2.9            4.7          1.4 versicolor
## 65            5.6           2.9            3.6          1.3 versicolor
## 66            6.7           3.1            4.4          1.4 versicolor
## 67            5.6           3.0            4.5          1.5 versicolor
```

```
## 68            5.8         2.7          4.1          1.0 versicolor
## 69            6.2         2.2          4.5          1.5 versicolor
## 70            5.6         2.5          3.9          1.1 versicolor
## 71            5.9         3.2          4.8          1.8 versicolor
## 72            6.1         2.8          4.0          1.3 versicolor
## 73            6.3         2.5          4.9          1.5 versicolor
## 74            6.1         2.8          4.7          1.2 versicolor
## 75            6.4         2.9          4.3          1.3 versicolor
## 76            6.6         3.0          4.4          1.4 versicolor
## 77            6.8         2.8          4.8          1.4 versicolor
## 78            6.7         3.0          5.0          1.7 versicolor
## 79            6.0         2.9          4.5          1.5 versicolor
## 80            5.7         2.6          3.5          1.0 versicolor
## 81            5.5         2.4          3.8          1.1 versicolor
## 82            5.5         2.4          3.7          1.0 versicolor
## 83            5.8         2.7          3.9          1.2 versicolor
## 84            6.0         2.7          5.1          1.6 versicolor
## 85            5.4         3.0          4.5          1.5 versicolor
## 86            6.0         3.4          4.5          1.6 versicolor
## 87            6.7         3.1          4.7          1.5 versicolor
## 88            6.3         2.3          4.4          1.3 versicolor
## 89            5.6         3.0          4.1          1.3 versicolor
## 90            5.5         2.5          4.0          1.3 versicolor
## 91            5.5         2.6          4.4          1.2 versicolor
## 92            6.1         3.0          4.6          1.4 versicolor
## 93            5.8         2.6          4.0          1.2 versicolor
## 94            5.0         2.3          3.3          1.0 versicolor
## 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
```

```
virginicaSubset <- subset(iris, Species == 'virginica' )
virginicaSubset
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
## 101           6.3         3.3          6.0          2.5 virginica
## 102           5.8         2.7          5.1          1.9 virginica
## 103           7.1         3.0          5.9          2.1 virginica
## 104           6.3         2.9          5.6          1.8 virginica
## 105           6.5         3.0          5.8          2.2 virginica
## 106           7.6         3.0          6.6          2.1 virginica
## 107           4.9         2.5          4.5          1.7 virginica
## 108           7.3         2.9          6.3          1.8 virginica
## 109           6.7         2.5          5.8          1.8 virginica
## 110           7.2         3.6          6.1          2.5 virginica
## 111           6.5         3.2          5.1          2.0 virginica
## 112           6.4         2.7          5.3          1.9 virginica
## 113           6.8         3.0          5.5          2.1 virginica
## 114           5.7         2.5          5.0          2.0 virginica
## 115           5.8         2.8          5.1          2.4 virginica
## 116           6.4         3.2          5.3          2.3 virginica
```

```
## 117           6.5           3.0           5.5           1.8 virginica
## 118           7.7           3.8           6.7           2.2 virginica
## 119           7.7           2.6           6.9           2.3 virginica
## 120           6.0           2.2           5.0           1.5 virginica
## 121           6.9           3.2           5.7           2.3 virginica
## 122           5.6           2.8           4.9           2.0 virginica
## 123           7.7           2.8           6.7           2.0 virginica
## 124           6.3           2.7           4.9           1.8 virginica
## 125           6.7           3.3           5.7           2.1 virginica
## 126           7.2           3.2           6.0           1.8 virginica
## 127           6.2           2.8           4.8           1.8 virginica
## 128           6.1           3.0           4.9           1.8 virginica
## 129           6.4           2.8           5.6           2.1 virginica
## 130           7.2           3.0           5.8           1.6 virginica
## 131           7.4           2.8           6.1           1.9 virginica
## 132           7.9           3.8           6.4           2.0 virginica
## 133           6.4           2.8           5.6           2.2 virginica
## 134           6.3           2.8           5.1           1.5 virginica
## 135           6.1           2.6           5.6           1.4 virginica
## 136           7.7           3.0           6.1           2.3 virginica
## 137           6.3           3.4           5.6           2.4 virginica
## 138           6.4           3.1           5.5           1.8 virginica
## 139           6.0           3.0           4.8           1.8 virginica
## 140           6.9           3.1           5.4           2.1 virginica
## 141           6.7           3.1           5.6           2.4 virginica
## 142           6.9           3.1           5.1           2.3 virginica
## 143           5.8           2.7           5.1           1.9 virginica
## 144           6.8           3.2           5.9           2.3 virginica
## 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
```

#4b. Get the mean for every characteristics of each species using colMeans(). Write the codes and its result.

```
setosa <- colMeans(setosaSubset[sapply(setosaSubset,is.numeric)])
setosa
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##        5.006        3.428        1.462        0.246
```

```
versicolor <- colMeans(versicolorSubset[sapply(versicolorSubset,is.numeric)])
versicolor
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##        5.936        2.770        4.260        1.326
```

```
virginica <- colMeans(virginicaSubset[sapply(virginicaSubset,is.numeric)])
virginica
```

```
## Sepal.Length  Sepal.Width Petal.Length  Petal.Width
##        6.588        2.974        5.552        2.026
```

#4c. Combine all species by using rbind().

```
rbindIrisData <- rbind(setosa, versicolor, virginica)
rbindIrisData
```

```
##            Sepal.Length Sepal.Width Petal.Length Petal.Width
## setosa            5.006       3.428        1.462       0.246
## versicolor        5.936       2.770        4.260       1.326
## virginica         6.588       2.974        5.552       2.026
```

#4d. From the data in 4-c: Create the barplot(). Write the codes and its result.

```
barplot(rbindIrisData,
        beside = TRUE,
        main = "Iris Data",
        xlab = "Characteristics",
        ylab = "Mean Scores",
        col = c("blue", "green", "yellow"),

)
```