# Rworksheet_Delgado#5

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Worksheet-5 in R Worksheet for R Programming

1. The table shows the enrollment of BS in Computer Science, SY 2010-2011. a. Plot the data using a bar graph. Write the codes and copy the result.

```
students <- data.frame("Course Year" = c ("1st", "2nd", "3rd", "4th"), " 2019-2020" = c(80, 75, 70, 60)
students
```

```
##   Course.Year X.2019.2020
## 1         1st          80
## 2         2nd          75
## 3         3rd          70
## 4         4th          60
```

```
course <- c(80,75,70,60)
bplot <- barplot(course, ylab = , names.arg = c("1st", "2nd", "3rd","4th"))
```
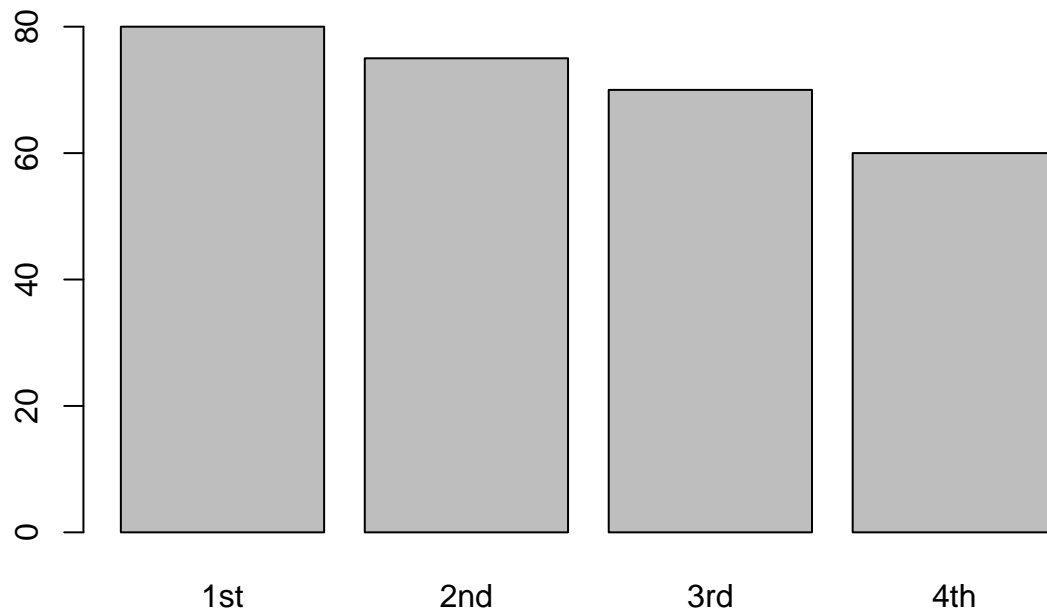

b. Using the same table, label the barchart with Title = " Enrollment of BS Computer Science horizontal axis = "Curriculum Year" and vertical axis = "number of students"

```r
bar2 <- barplot(course, col = rainbow(4),
                main = " Enrollment of BS Computer Science",
                xlab = "Curriculum Year",
                ylab =  "Number of students", names.arg = c("1st", "2nd", "3rd","4th"))
```


Enrollment of BS Computer Science
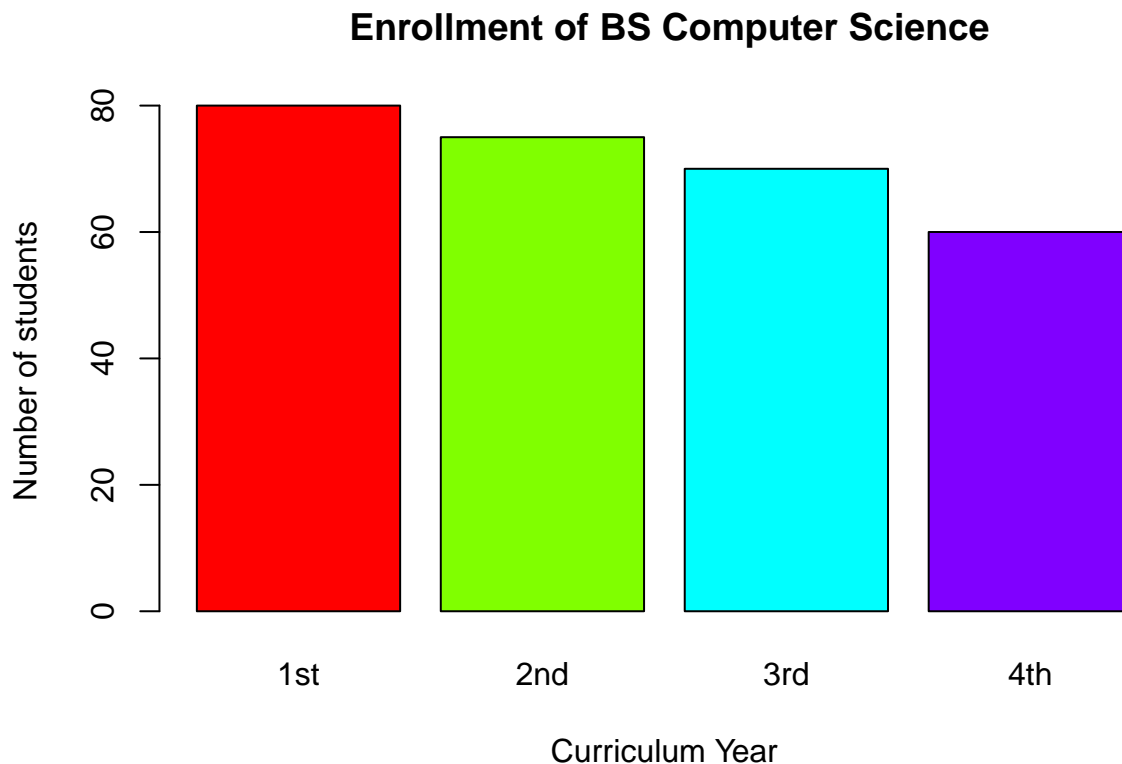
```r
bar2
```

```
##      [,1]
## [1,]  0.7
## [2,]  1.9
## [3,]  3.1
## [4,]  4.3
```

2. 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.

```r
family_spent <- c(60,10,5,25)
```

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

```r
month_exp <- data.frame(
  exp_names = c("Food", "Electricity", "Savings", "Miscellaneous_expenses"),
  spent = c(60, 10, 5, 25)
)
month_exp
```

```
##               exp_names spent
## 1                  Food    60
```

```
## 2            Electricity    10
## 3               Savings     5
## 4 Miscellaneous_expenses    25
```

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

```
pie(family_spent, col = rainbow(4))
```
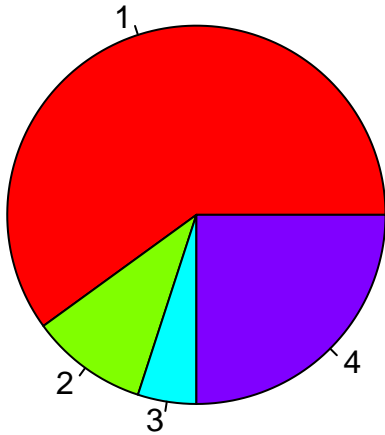


```
family_spent_labels <- round(family_spent/sum(family_spent) * 100, 10)
family_spent_labels <- paste(family_spent_labels, "%", sep = "")
```

```
pie1 <- pie(family_spent, main = "Expenses", col = rainbow(length(family_spent)), labels = family_spent
```

```
legend(1.5, 0.5, c(" Food", "Electricity","Savings","Other expenses"), cex= 0.6, bty = "n", fill = rain
```
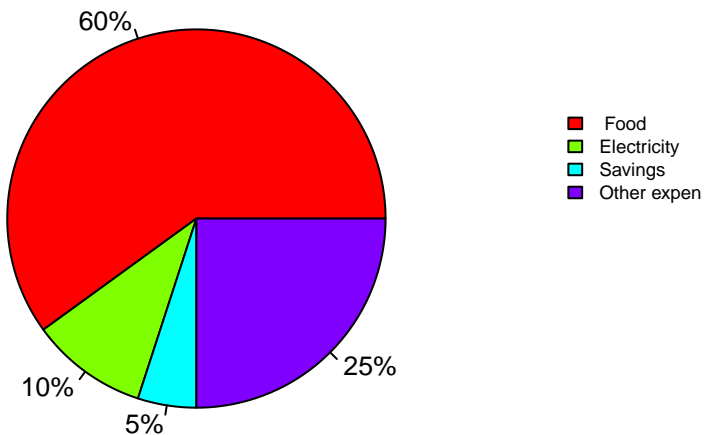

3. Open the mtcars dataset.

```
View(mtcars)
```

```
## Warning in View(mtcars): unable to open display
```

```
## Error in .External2(C_dataviewer, x, title): unable to start data viewer
```

a. Create a simple histogram specifically for mpg (miles per gallon) variable. Use $ to select the mpg only.
   Write the codes and its result.

```
mtcarsData <- mtcars$mpg
mtcarsData
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2 10.4
## [16] 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4 15.8 19.7
## [31] 15.0 21.4
```

```
x <- hist(mtcarsData, col = "skyblue")
```

Histogram of mtcarsData
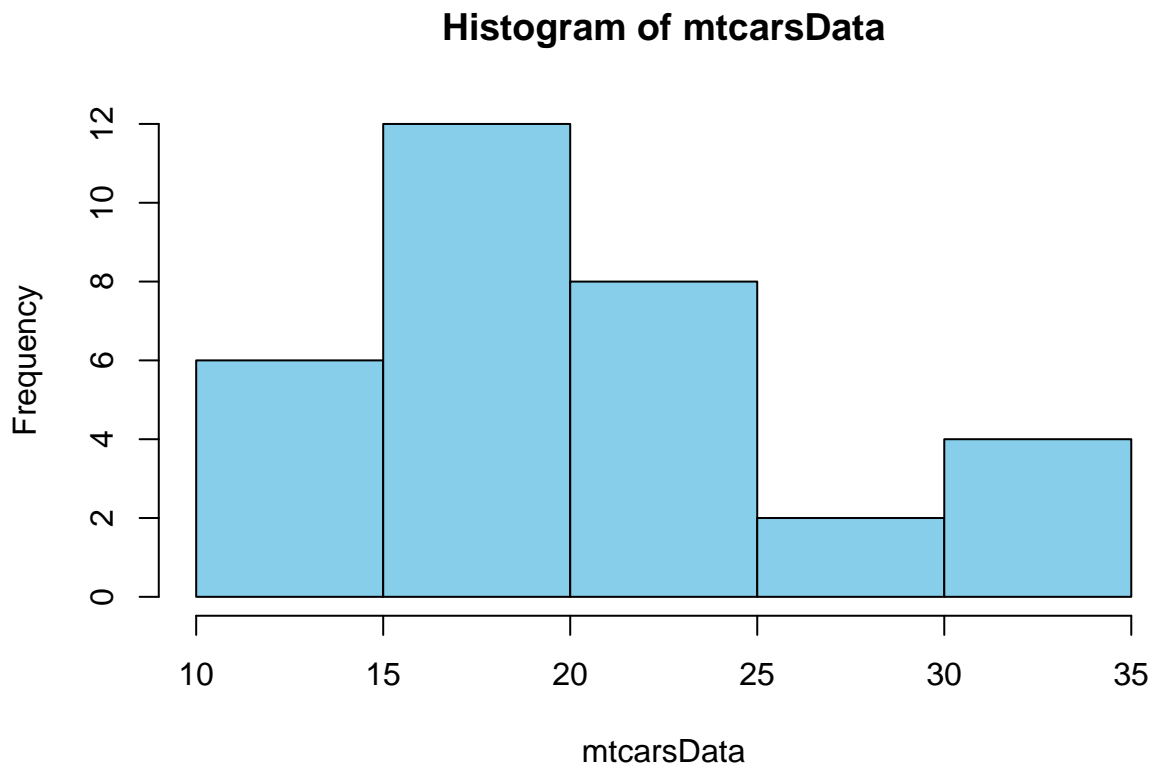

```
x
```

```
## $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] "mtcarsData"
```

```
## 
## $equidist
## [1] TRUE
## 
## attr(,"class")
## [1] "histogram"
```

b. Colored histogram with different number of bins. hist(mtcars$mpg, breaks=12, col="red") Note:
breaks= controls the number of bins

```
hist(mtcarsData, breaks=5, col="red")
```

Histogram of mtcarsData
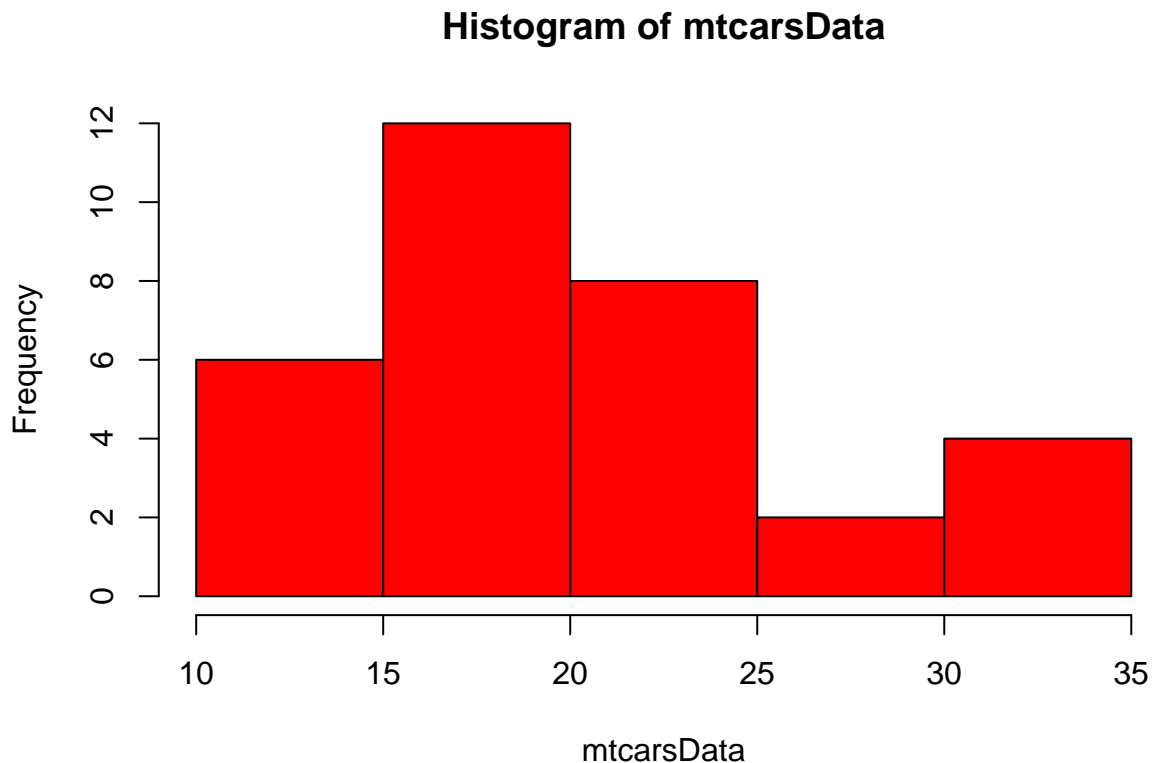
c. Add a Normal Curve x <- mtcarsmpgh < -hist(x, breaks = 10, col = "red", xlab = "MilesPerGallon", main = "HistogramwithNormalCurve")$xfit < -seq(min(x), max(x), length = 40)$yfit < -dnorm(xfit, mean = mean(x), sd = sd(x))$yfit < -yfit * diff(h$mids[1:2])*length(x) lines(xfit, yfit, col="blue", lwd=2)
Copy the result.

```
curveData <- mtcarsData
curveData
```

```
##  [1] 21.0 21.0 22.8 21.4 18.7 18.1 14.3 24.4 22.8 19.2 17.8 16.4 17.3 15.2 10.4
## [16] 10.4 14.7 32.4 30.4 33.9 21.5 15.5 15.2 13.3 19.2 27.3 26.0 30.4 15.8 19.7
## [31] 15.0 21.4
```

```
histData <-hist(curveData, breaks=10, col="red", xlab="Miles Per Gallon",
                main="Histogram with Normal Curve")
xfit<-seq(min(curveData),max(curveData),length=40)
```

```
yfit<-dnorm(xfit,mean=mean(curveData),sd=sd(curveData))
yfit <- yfit*diff(histData$mids[1:2])*length(curveData)
lines(xfit, yfit, col="blue", lwd=2)
```

Histogram with Normal Curve
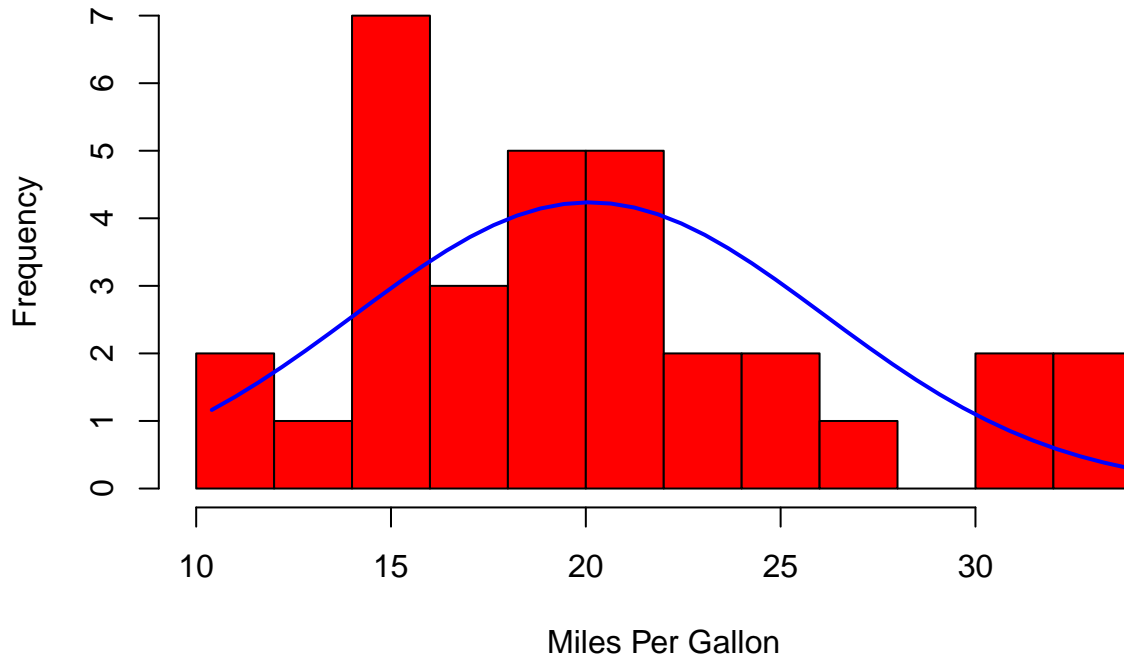

```
histData
```

```
## $breaks
##  [1] 10 12 14 16 18 20 22 24 26 28 30 32 34
##
## $counts
##  [1] 2 1 7 3 5 5 2 2 1 0 2 2
##
## $density
##  [1] 0.031250 0.015625 0.109375 0.046875 0.078125 0.078125 0.031250 0.031250
##  [9] 0.015625 0.000000 0.031250 0.031250
##
## $mids
##  [1] 11 13 15 17 19 21 23 25 27 29 31 33
##
## $xname
## [1] "curveData"
##
## $equidist
## [1] TRUE
##
## attr(,"class")
## [1] "histogram"
```

4. Open the iris dataset. Create a subset for each species. a. Write the codes and its result.

```
View("iris")
```

```
## Warning in View("iris"): unable to open display
```

```
## Error in .External2(C_dataviewer, x, title): unable to start data viewer
```

```
data_iris <- data.frame(iris)
data_iris
```

```
##     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
## 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
## 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
```

```r
data_setosa <- subset(data_iris, Species == 'setosa' )
data_setosa
```

```
##    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
data_versicolor <- subset(data_iris, Species == 'versicolor' )
data_versicolor
```

```
##     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
```

```r
data_virgica <- subset(data_iris, Species == 'virginica' )
data_virgica
```

```
##     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
```

b. Get the mean for every characteristics of each species using colMeans(). Write the codes and its result. Example: setosa <- colMeans(setosa[sapply(setosaDF,is.numeric)])

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

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

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

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

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

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

c. Combine all species by using rbind() The table should be look like this:

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

```
##            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
```

```
combineDF <- data.frame(combinedata)
combineDF
```

```
##            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
```

d From the data in 4-c: Create the barplot(). Write the codes and its result. The barplot should be like this.

```
barplot (as.matrix(combineDF), col = rainbow(3), main = "Iris Data",
         ylab = "Mean Scores",
         beside = T)
```

Iris Data