# Worksheet5

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2022-12-13

1. The table shows the enrollment of BS in Computer Science, SY 2010-2011.

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

```
##   Course.Year X2019.2020
## 1         1st         80
## 2         2nd         75
## 3         3rd         70
## 4         4th         60
```

a. Plot the data using a bar graph. Write the codes and copy the result.

```
stud_data <- c("1st" = 80, "2nd" = 75, "3rd" = 70, "4th" = 60)
barplot(stud_data)
```
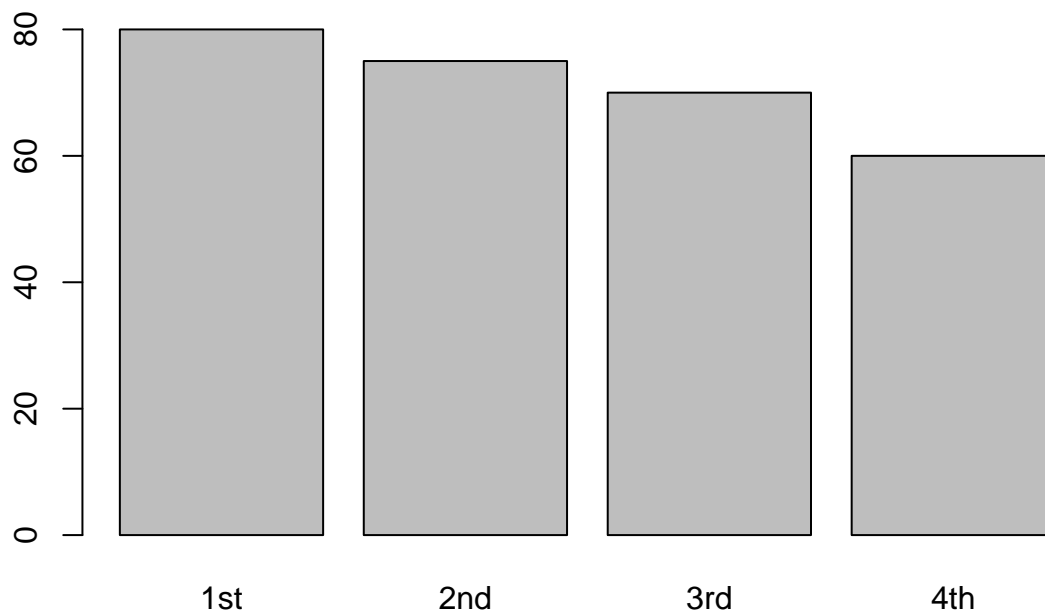
b.Using the same table, label the barchart with Title = " Enrollment of BS Computer Science horizontal axis = "Curriculum Year" and vertical axis = "number of students"

```
stud_data <- c("1st" = 80, "2nd" = 75, "3rd" = 70, "4th" = 60)
barplot(stud_data, main = "Enrollment of BS Computer Science", xlab = "number of students", ylab = "Cou
```

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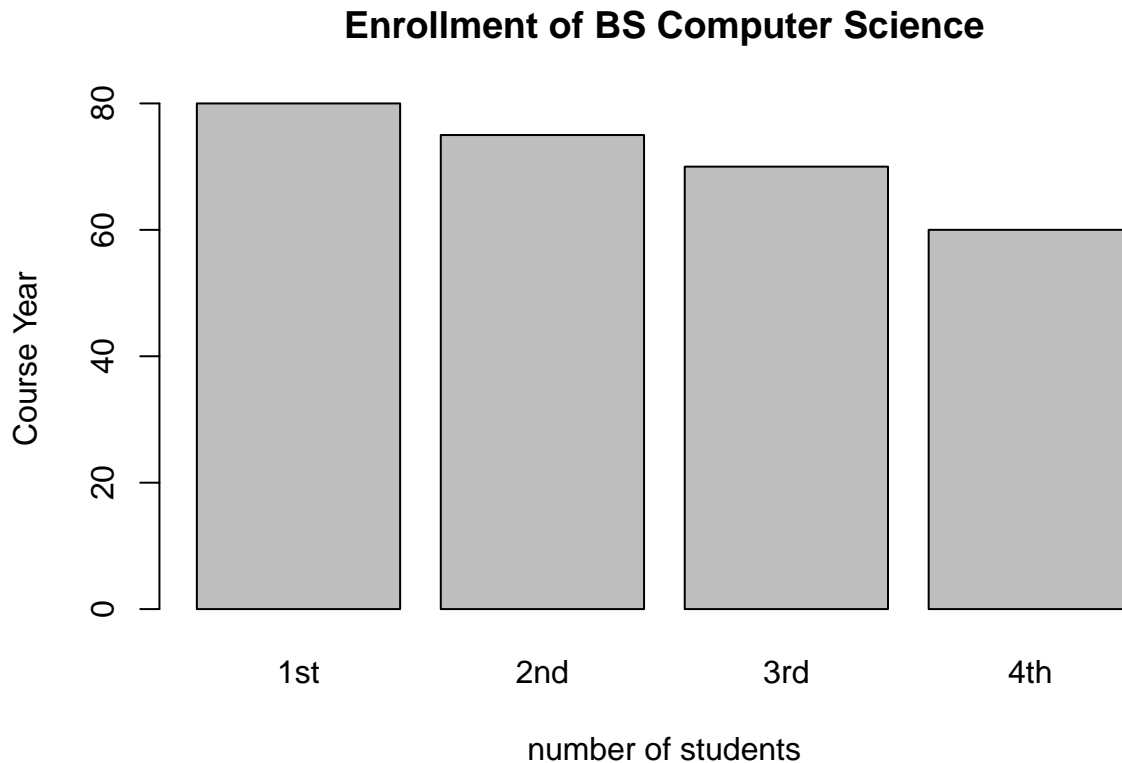
2. The monthly income of De Jesus family was spent on the following: 60% on Food, 10% on electricity, 5% for savings, and 25% for other miscellaneous expenses.

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

```
debit <- c("Food","Electricity","Savings","Miscellaneous_expenses")
money <- c(60, 10, 5, 25)

spend <- data.frame(debit, money)
spend
```

```
##                       debit money
## 1                      Food    60
## 2               Electricity    10
## 3                   Savings     5
## 4 Miscellaneous_expenses      25
```

```
tbl <- table(spend)
tbl
```

```
##                          money
## debit                     5 10 25 60
##    Electricity            0  1  0  0
##    Food                   0  0  0  1
##    Miscellaneous_expenses 0  0  1  0
##    Savings                1  0  0  0
```

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

```r
money = c(60, 10, 5, 25)

data <- round(money/sum(money)*100,1)
data <- paste(data, "%", sep = " ")

piechart <- pie(money, labels = data, cex = 0.8 , col = rainbow(4),main = "De Jesus family Monthly Expen
legend ("topright", c("Food", "Electricity", "Savings", "Miscellaneous_expenses"),
        cex = 0.8 , fill = rainbow(4))
```

De Jesus family Monthly Expense
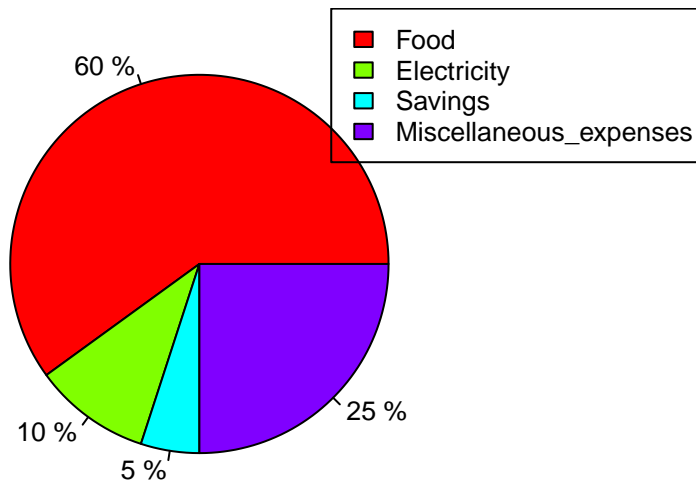
3. Open the mtcars dataset.

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

```r
data(mtcars)

mcars <-(mtcars$mpg)
mcars
```

```
##  [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
```

```
hist(mtcars$mpg)
```

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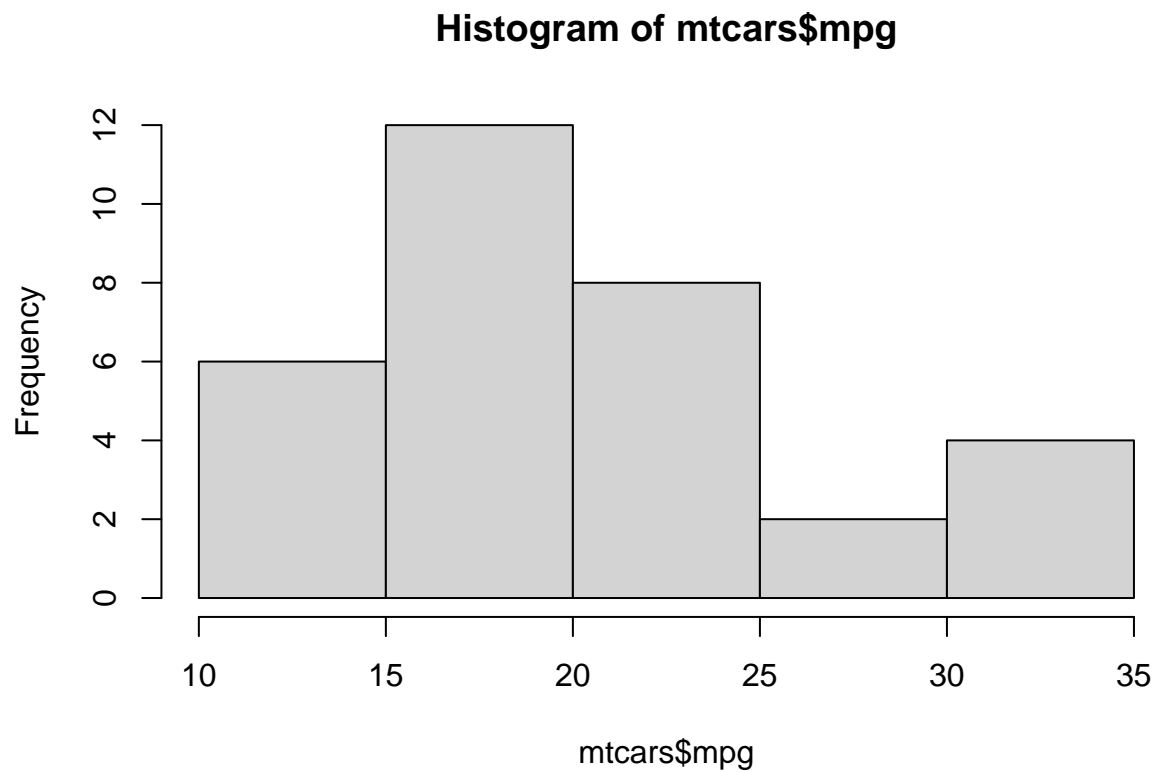
b. Colored histogram with different number of bins. hist(mtcars$mpg, breaks=12, col="red") Note: breaks= controls the number of bins.

```
hist(mtcars$mpg, breaks=12, col="red")
```

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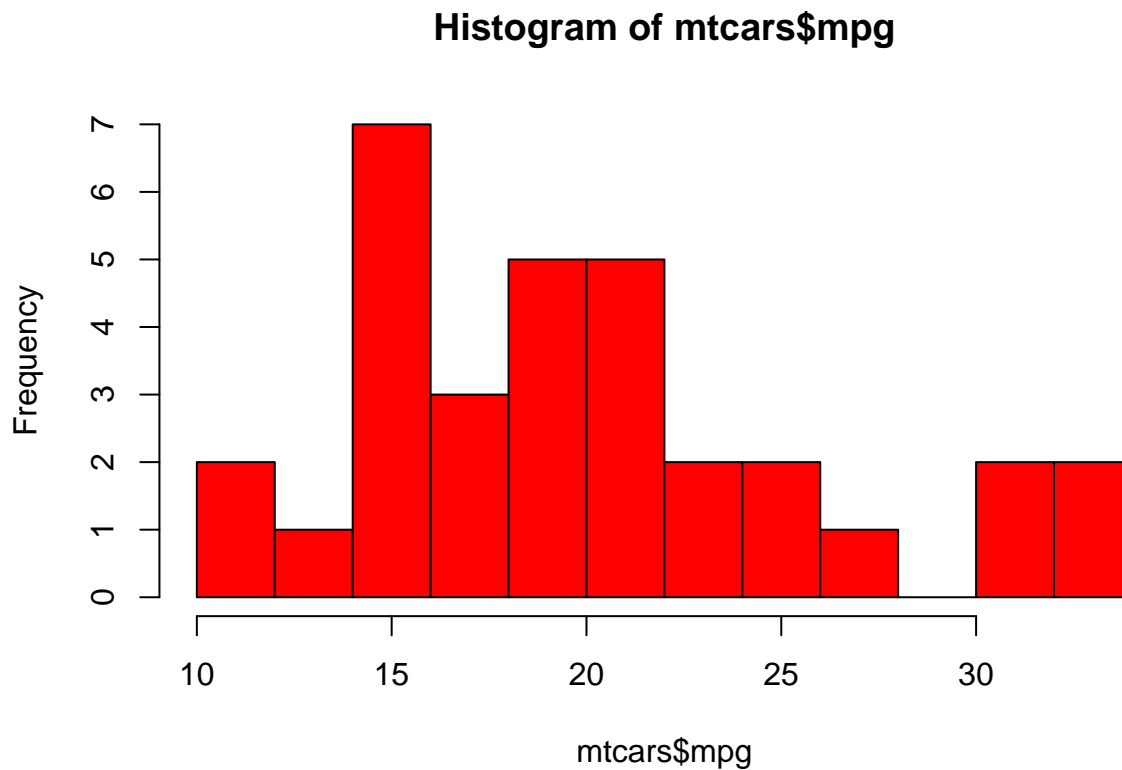
c. Add a Normal Curve x <- mtcars$mpg h <- hist(x, breaks = 10, col = "red", xlab = "Miles Per Gallon", main = "Histogram with Normal Curve") xfit <- seq(min(x), max(x), length = 40) yfit <- dnorm(xfit, mean = mean(x), sd = sd(x)) yfit <- yfit * diff(h$mids[1:2])*length(x) lines(xfit, yfit, col="blue",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

```
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
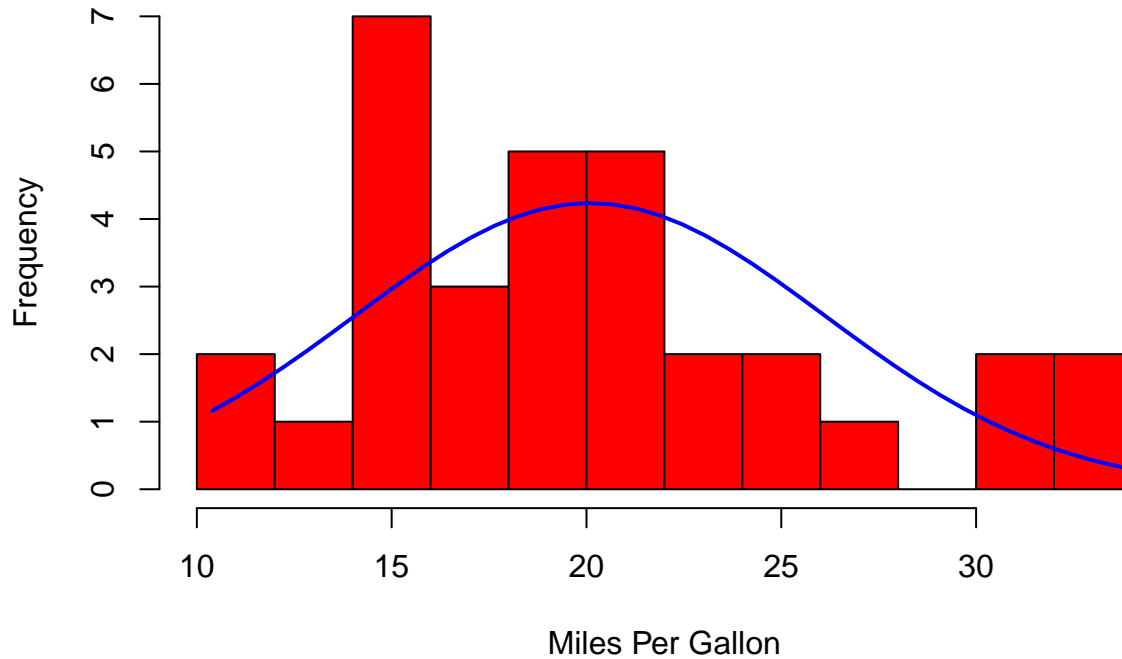
4. Open the iris dataset. Create a subset for each species.

a. Write the codes and its result.

```
data("iris")

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

```
##      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
setosaDF <- data.frame(iris)
setosaDF
```

```
##     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
```

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

```
##     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
virginicaDF <- data.frame(iris)
virginicaDF
```

```
##      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
setosa <- subset(setosaDF, Species == 'setosa')
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
versicolor <- subset(versicolorDF, Species == 'versicolor')
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
```

```
virginica <- subset(virginicaDF, Species == 'virginica')
virginica
```

```
##      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)])

```
setosa1 <- colMeans(setosa[sapply(setosaDF, is.numeric)])
setosa1
```

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

```
virginica1 <- colMeans(virginica[sapply(virginicaDF, is.numeric)])
virginica1
```

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

```
versicolor1 <- colMeans(versicolor[sapply(versicolorDF, is.numeric)])
versicolor1
```

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

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

```
combine <- rbind(setosa1, versicolor1, virginica1)
dfcombine <- data.frame(combine)
dfcombine
```

```
##              Sepal.Length Sepal.Width Petal.Length Petal.Width
## setosa1             5.006       3.428        1.462       0.246
## versicolor1         5.936       2.770        4.260       1.326
## virginica1          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(height = as.matrix(dfcombine), main = "Iris Data",
        ylab = "Mean Scores",
        beside = T, col = rainbow(3))
```

Iris Data