Practical 7(A): Time Series

```
#rainfall <- c(799,1174.8,865.1,1334.6,635.4,918.5,685.5,998.6,784.2,985,882.8,1071)

#rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency = 12)

#print(rainfall.timeseries)
```

```
     Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct
2012  799.0 1174.8  865.1 1334.6  635.4  918.5  685.5  998.6  784.2  985.0
      Nov    Dec
2012  882.8 1071.0
```

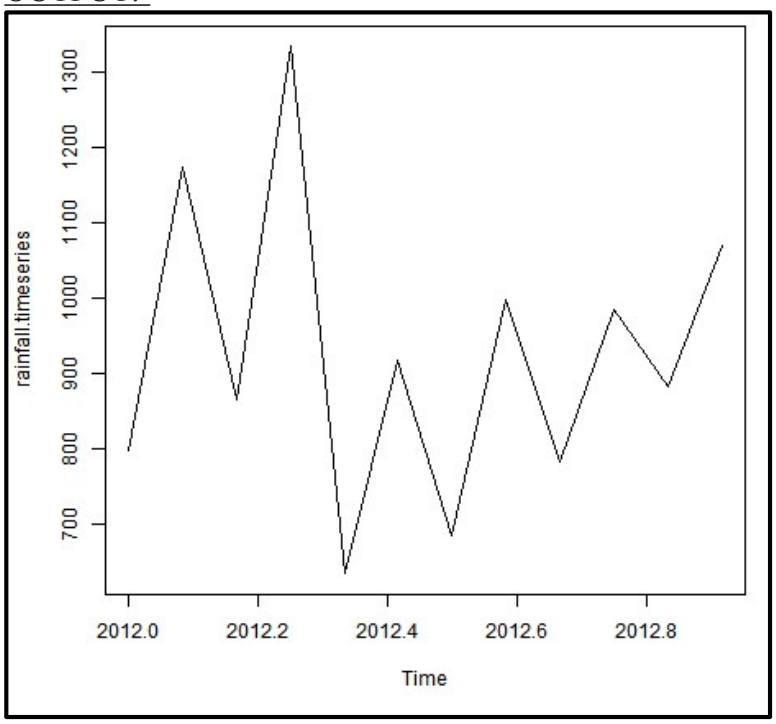
```
#png(file = "rainfall.png")

#plot(rainfall.timeseries)

#dev.off()
```

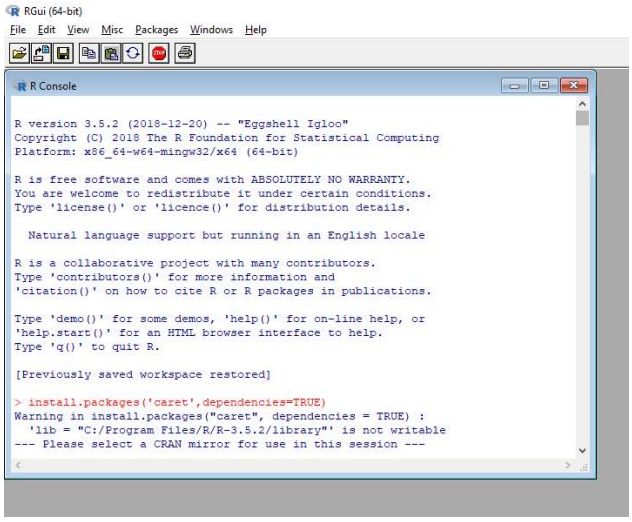
```
null device
          1
```

OUTPUT:-

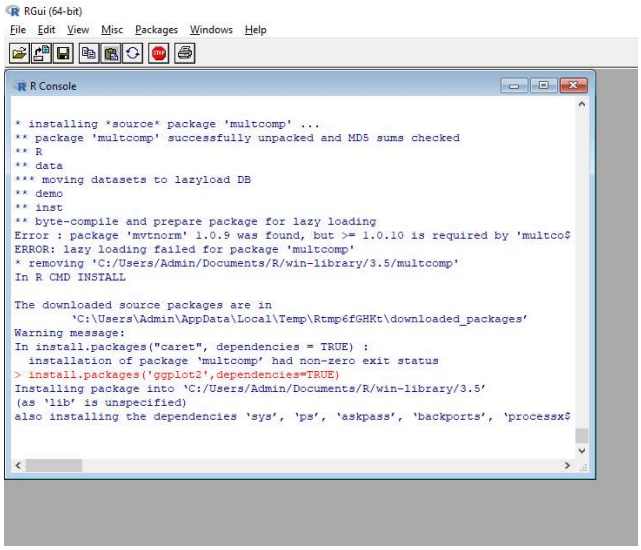


Practical 8: Perform the data clustering using clustering algorithm

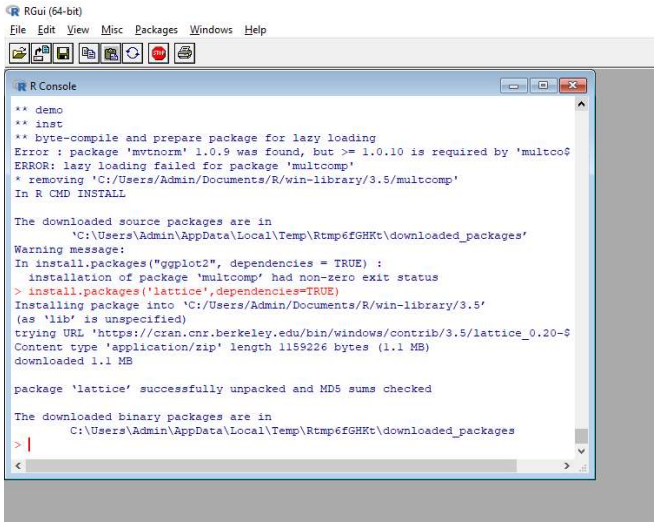
Step 1 : Install Library → install.packages('caret',dependencies=TRUE)



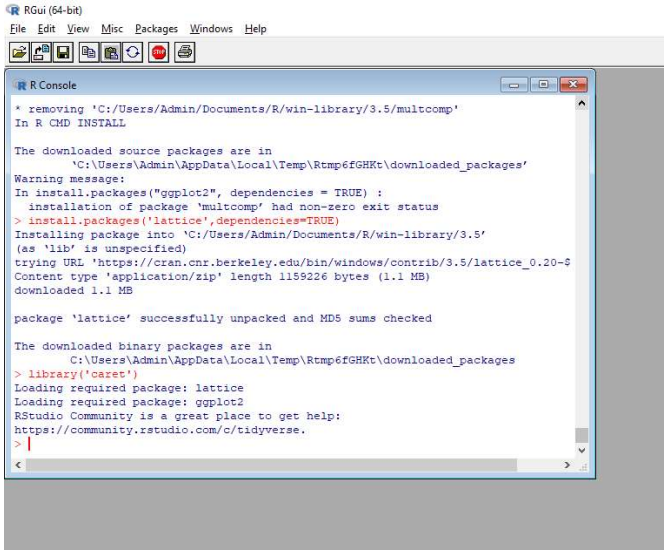
Step 2 : Install Library → install.packages('ggplot2',dependencies=TRUE)



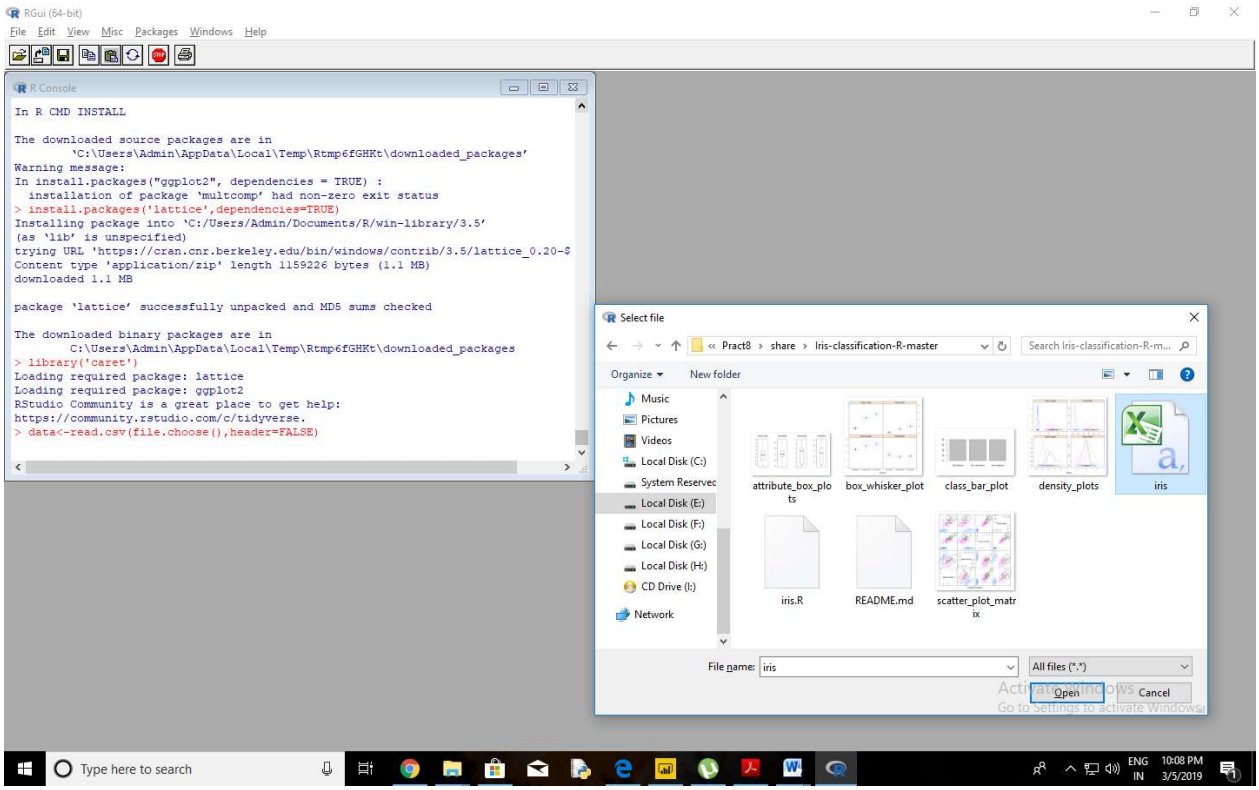
Step 3 : Install Library → install.packages('lattice',dependencies=TRUE)



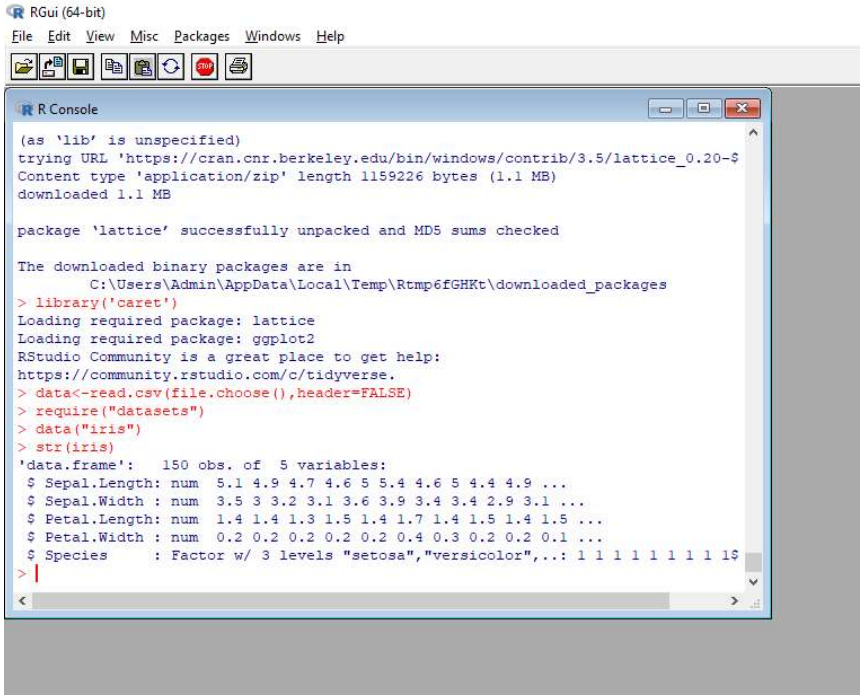
Step 4 : library('caret')



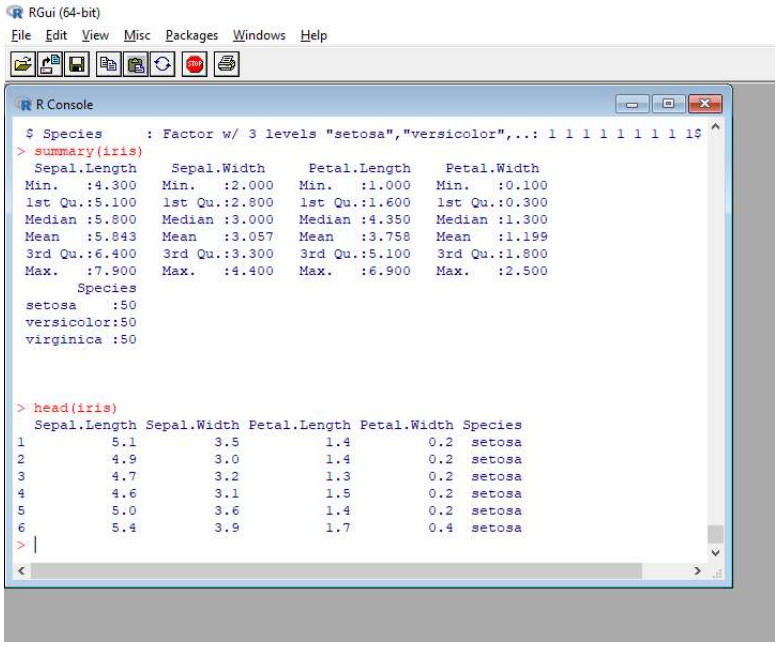
Step 5 : Choose file(.csv) → data<-read.csv(file.choose(),header=FALSE)



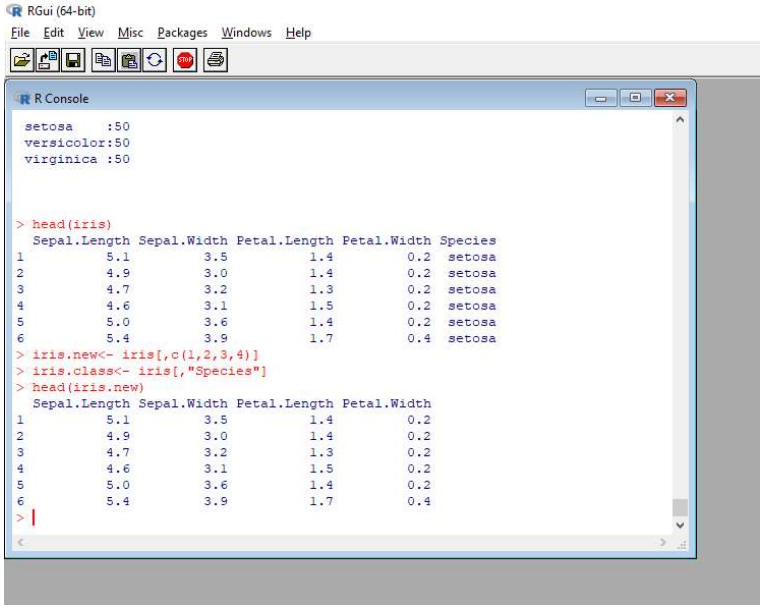
Step 6 : Display data in the file.



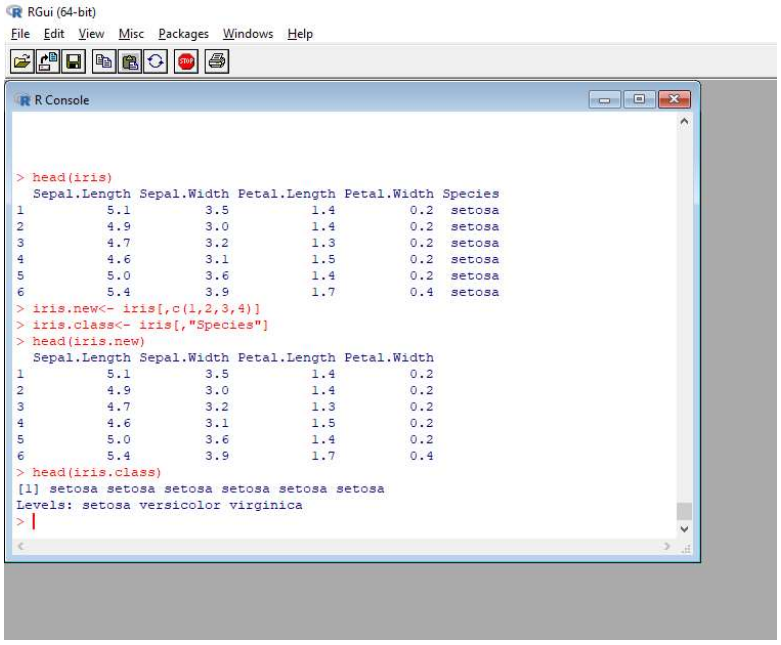
Step 7 : View the summary and table headers of the data.



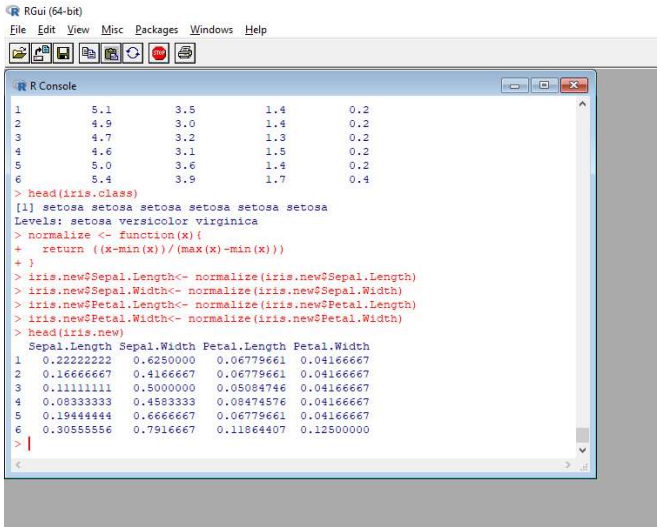
Step 8 : Create a new class having only the data that we want.



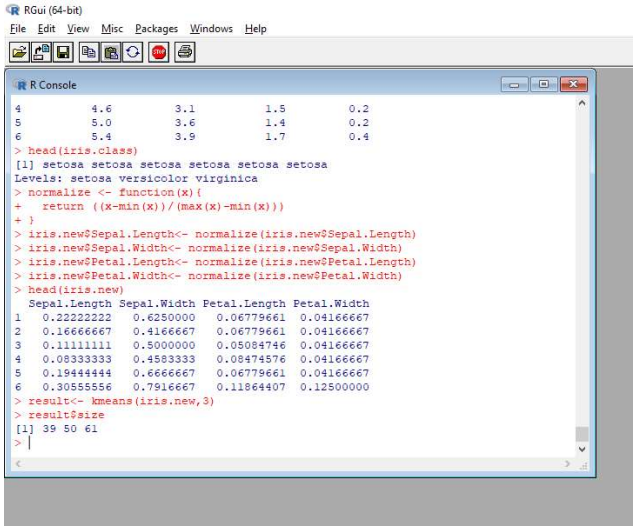
Step 9 : Viewing the headers of our new class



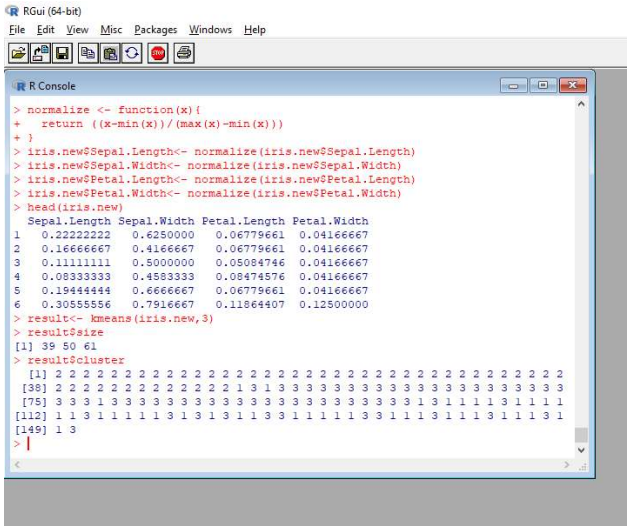
Step 10 : Normalize the data.



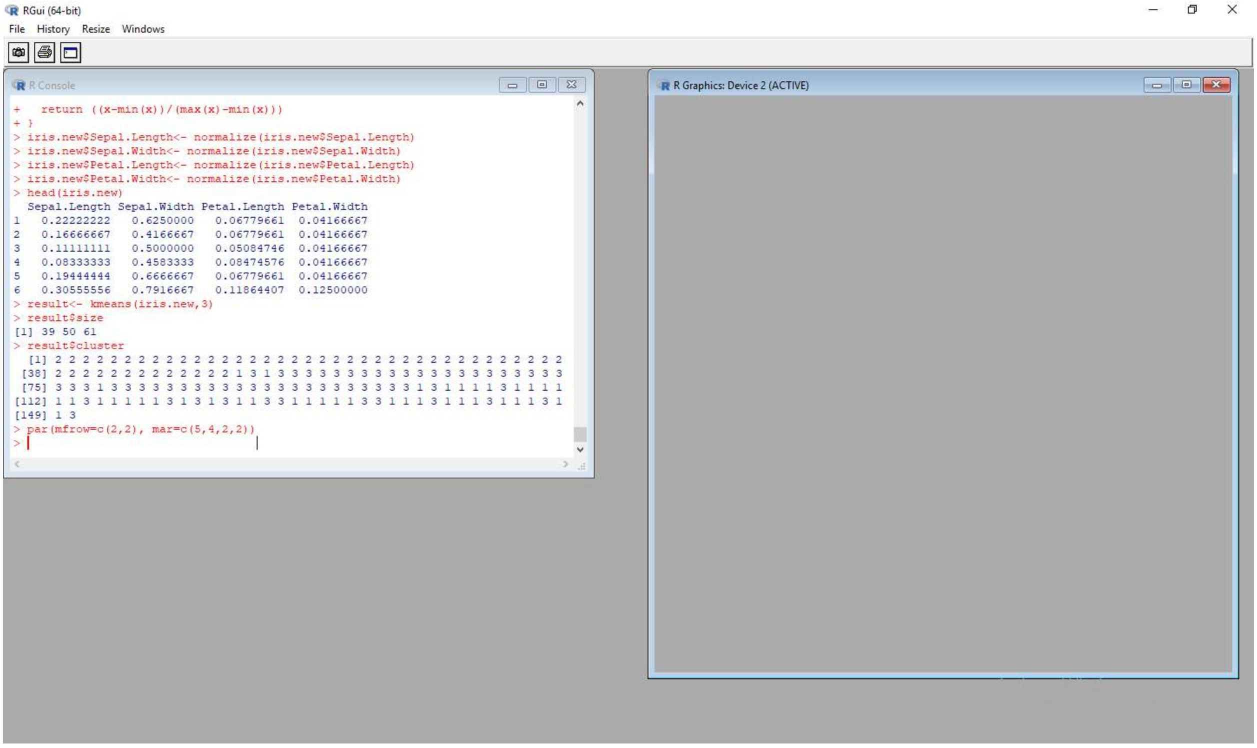
Step 11 : Apply K-Means Clustering with 3 clusters using kmeans function.



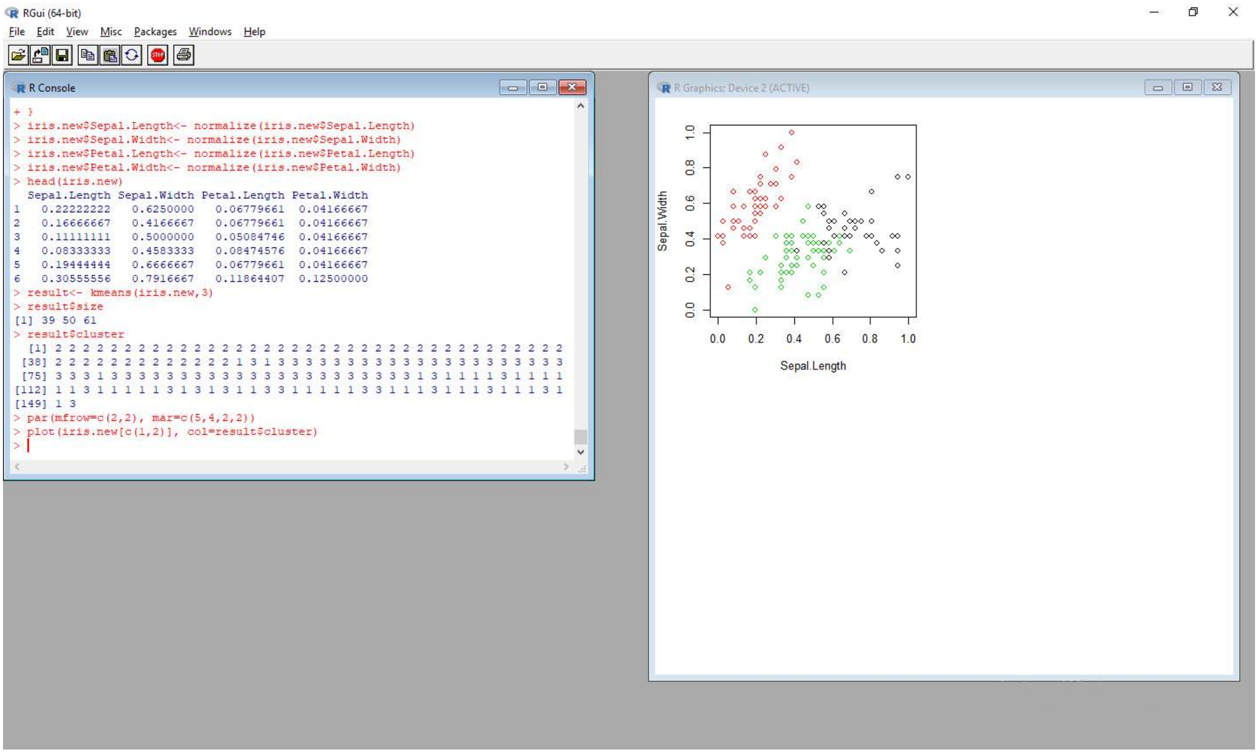
Step 12 : View Results.

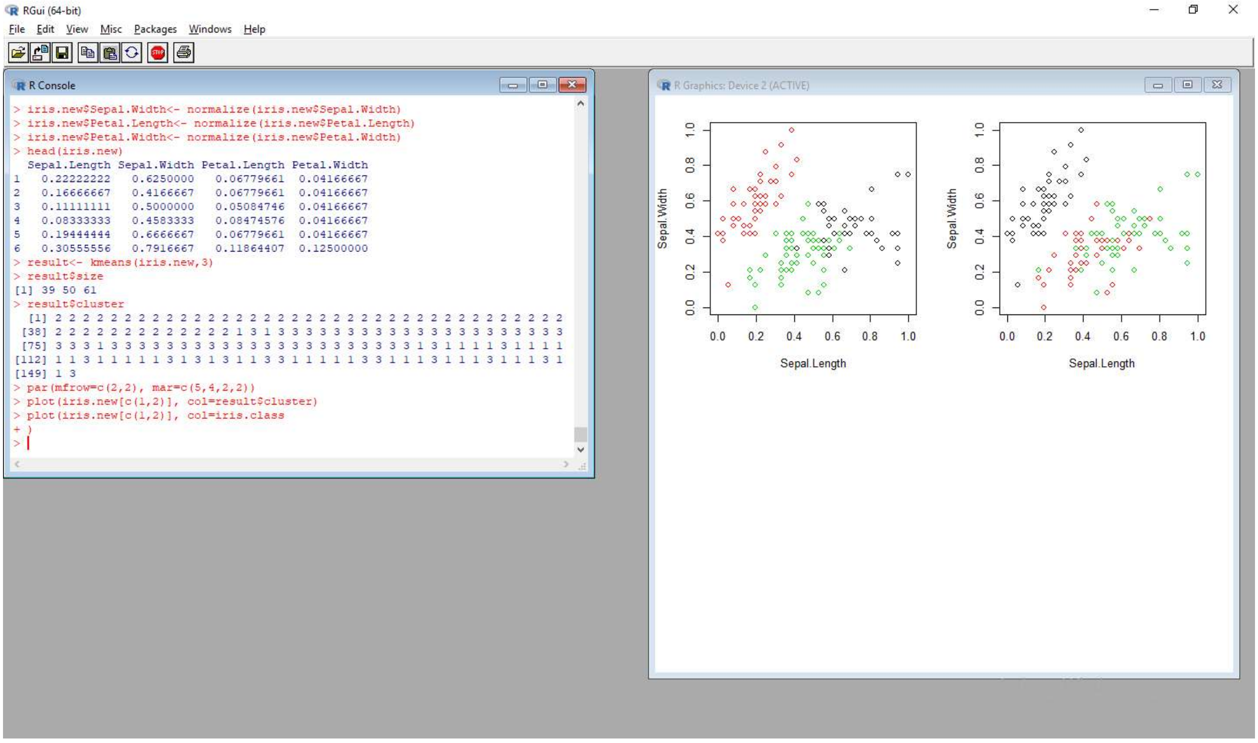


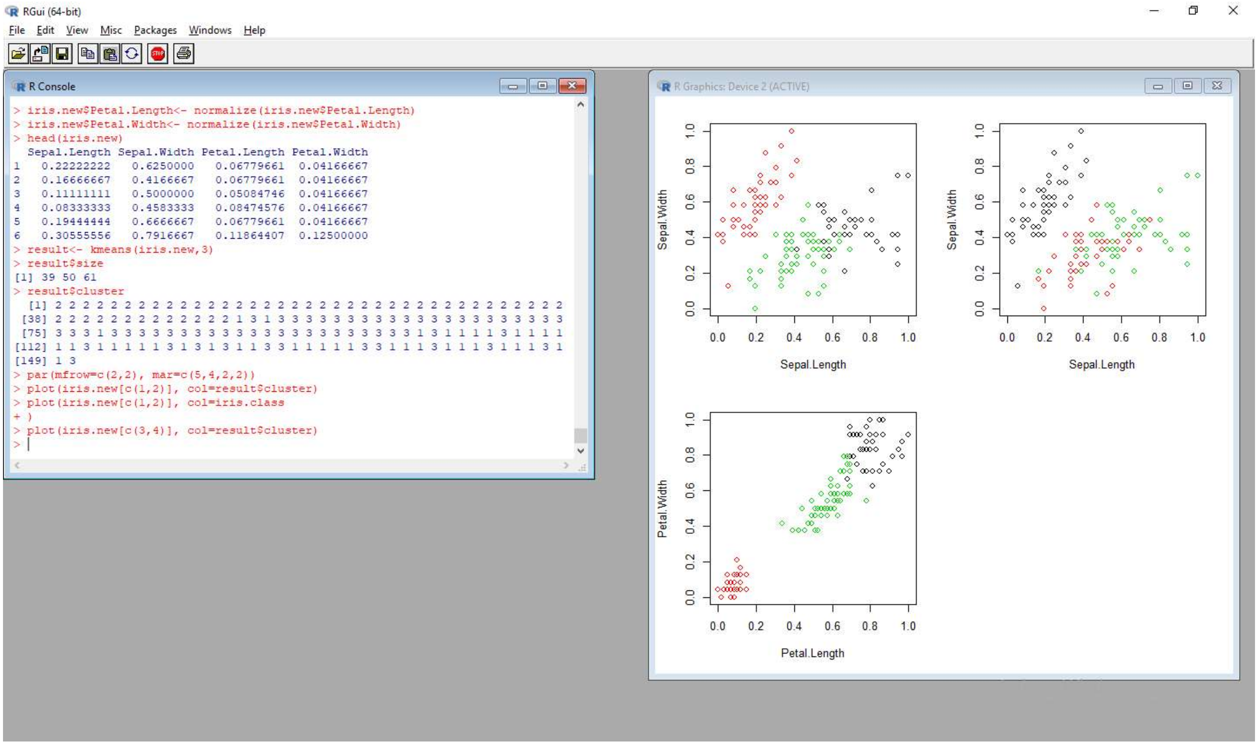
Step 13 : Initialize row and columns area to draw the clusters graphically .

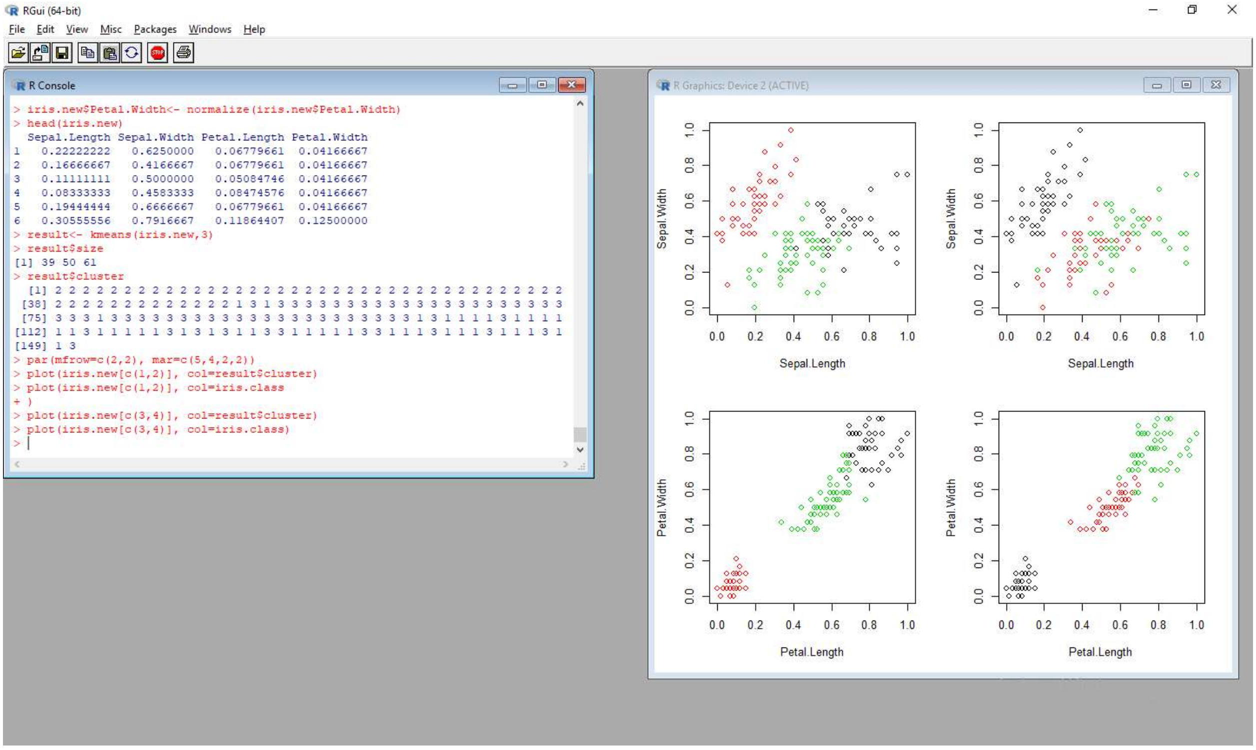


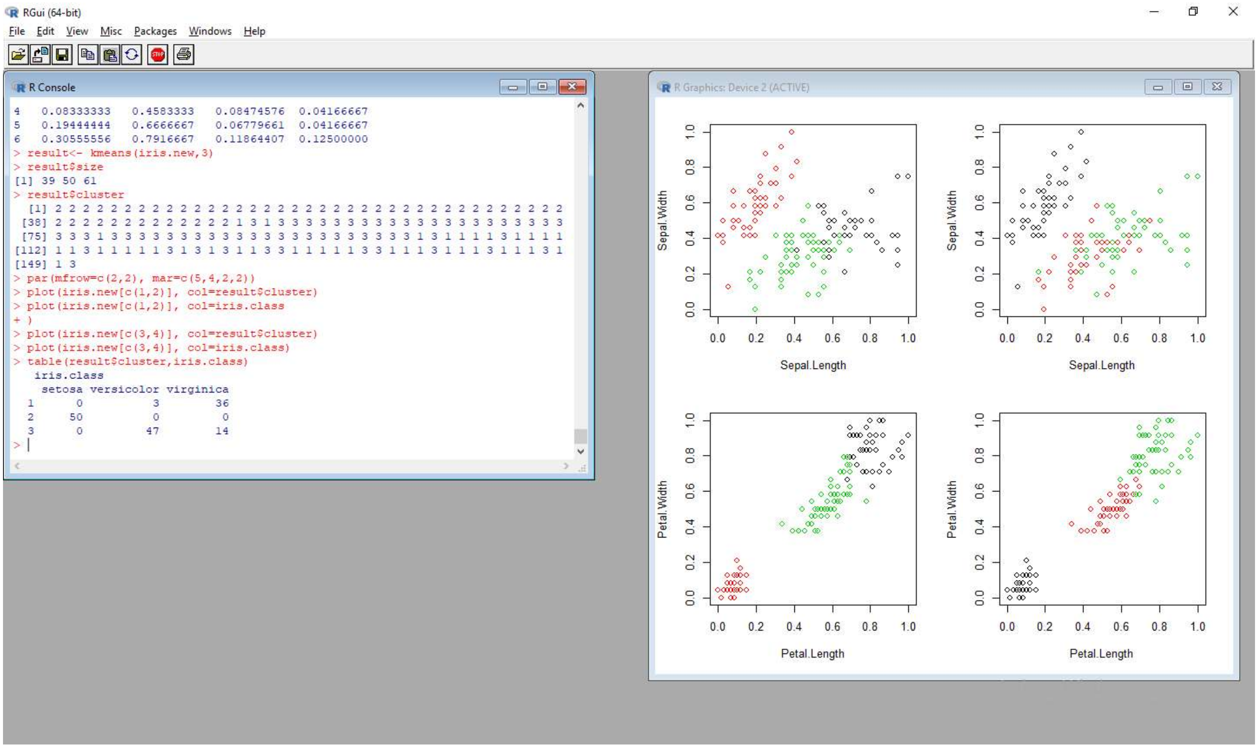
Step 14 : Draw the clusters with respect to sepal length and width and petal length and width.




RGui (64-bit)
File Edit View Misc Packages Windows Help
R Console
> iris.new$Sepal.Width<- normalize(iris.new$Sepal.Width)
> iris.new$Petal.Length<- normalize(iris.new$Petal.Length)
> iris.new$Petal.Width<- normalize(iris.new$Petal.Width)
> head(iris.new)
Sepal.Length Sepal.Width Petal.Length Petal.Width
1 0.22222222 0.6250000 0.06779661 0.04166667
2 0.16666667 0.4166667 0.06779661 0.04166667
3 0.11111111 0.5000000 0.05084746 0.04166667
4 0.08333333 0.4583333 0.08474576 0.04166667
5 0.19444444 0.6666667 0.06779661 0.04166667
6 0.30555556 0.7916667 0.11864407 0.12500000
> result<- kmeans(iris.new,3)
> result$size
[1] 39 50 61
> result$cluster
[1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
[38] 2 2 2 2 2 2 2 2 2 2 2 2 2 1 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
[75] 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 1 1 1 1 3 1 1 1 1
[112] 1 1 3 1 1 1 1 1 3 1 3 1 3 1 1 3 3 1 1 1 1 1 3 3 1 1 1 3 1 1 1 3 1 1 1 3 1
[149] 1 3
> par(mfrow=c(2,2), mar=c(5,4,2,2))
> plot(iris.new[c(1,2)], col=result$cluster)
> plot(iris.new[c(1,2)], col=iris.class
+)
>
R Graphics: Device 2 (ACTIVE)
Sepal.Width
Sepal.Length


RGui (64-bit)
File Edit View Misc Packages Windows Help
R Console
> iris.new$Petal.Length<- normalize(iris.new$Petal.Length)
> iris.new$Petal.Width<- normalize(iris.new$Petal.Width)
> head(iris.new)
Sepal.Length Sepal.Width Petal.Length Petal.Width
1 0.22222222 0.6250000 0.06779661 0.04166667
2 0.16666667 0.4166667 0.06779661 0.04166667
3 0.11111111 0.5000000 0.05084746 0.04166667
4 0.08333333 0.4583333 0.08474576 0.04166667
5 0.19444444 0.6666667 0.06779661 0.04166667
6 0.30555556 0.7916667 0.11864407 0.12500000
> result<- kmeans(iris.new,3)
> result$size
[1] 39 50 61
> result$cluster
[1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
[38] 2 2 2 2 2 2 2 2 2 2 2 2 2 1 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
[75] 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 1 1 1 1 3 1 1 1 1
[112] 1 1 3 1 1 1 1 1 3 1 3 1 3 1 1 3 3 1 1 1 1 1 3 3 1 1 1 3 1 1 1 3 1 1 1 3 1
[149] 1 3
> par(mfrow=c(2,2), mar=c(5,4,2,2))
> plot(iris.new[c(1,2)], col=result$cluster)
> plot(iris.new[c(1,2)], col=iris.class
+)
> plot(iris.new[c(3,4)], col=result$cluster)
>
R Graphics: Device 2 (ACTIVE)
Sepal.Width
Sepal.Length
Petal.Width
Petal.Length


RGui (64-bit)
File Edit View Misc Packages Windows Help
R Console
> iris.new$Petal.Width<- normalize(iris.new$Petal.Width)
> head(iris.new)
Sepal.Length Sepal.Width Petal.Length Petal.Width
1 0.22222222 0.6250000 0.06779661 0.04166667
2 0.16666667 0.4166667 0.06779661 0.04166667
3 0.11111111 0.5000000 0.05084746 0.04166667
4 0.08333333 0.4583333 0.08474576 0.04166667
5 0.19444444 0.6666667 0.06779661 0.04166667
6 0.30555556 0.7916667 0.11864407 0.12500000
> result<- kmeans(iris.new,3)
> result$size
[1] 39 50 61
> result$cluster
[1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
[38] 2 2 2 2 2 2 2 2 2 2 2 2 2 1 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
[75] 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 1 1 1 1 3 1 1 1 1
[112] 1 1 3 1 1 1 1 1 3 1 3 1 3 1 1 3 3 1 1 1 1 1 3 3 1 1 1 3 1 1 1 3 1 1 1 3 1
[149] 1 3
> par(mfrow=c(2,2), mar=c(5,4,2,2))
> plot(iris.new[c(1,2)], col=result$cluster)
> plot(iris.new[c(1,2)], col=iris.class
+)
> plot(iris.new[c(3,4)], col=result$cluster)
> plot(iris.new[c(3,4)], col=iris.class)
R Graphics: Device 2 (ACTIVE)
Sepal.Width
Sepal.Length
Petal.Width
Petal.Length


RGui (64-bit)
File Edit View Misc Packages Windows Help
R Console
4 0.08333333 0.4583333 0.08474576 0.04166667
5 0.19444444 0.6666667 0.06779661 0.04166667
6 0.30555556 0.7916667 0.11864407 0.12500000
> result<- kmeans(iris.new,3)
> result$size
[1] 39 50 61
> result$cluster
[1] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
[38] 2 2 2 2 2 2 2 2 2 2 2 2 2 1 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
[75] 3 3 3 1 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 1 3 1 1 1 1 3 1 1 1 1
[112] 1 1 3 1 1 1 1 1 3 1 3 1 3 1 1 3 3 1 1 1 1 1 3 3 1 1 1 3 1 1 1 3 1 1 1 3 1
[149] 1 3
> par(mfrow=c(2,2), mar=c(5,4,2,2))
> plot(iris.new[c(1,2)], col=result$cluster)
> plot(iris.new[c(1,2)], col=iris.class
+)
> plot(iris.new[c(3,4)], col=result$cluster)
> plot(iris.new[c(3,4)], col=iris.class)
> table(result$cluster,iris.class)
iris.class
setosa versicolor virginica
1 0 3 36
2 50 0 0
3 0 47 14
R Graphics: Device 2 (ACTIVE)
Sepal.Width
Sepal.Length
Petal.Width
Petal.Length