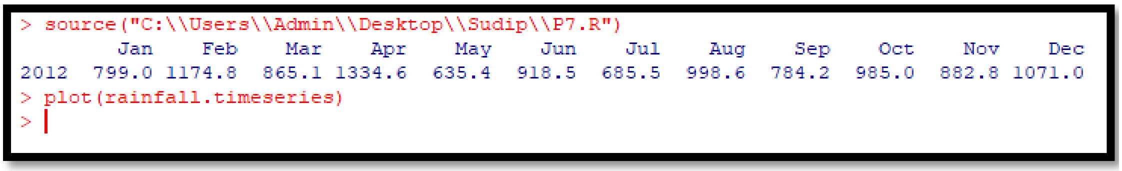
Practical No.7 Perform the data classification using classification algorithm.

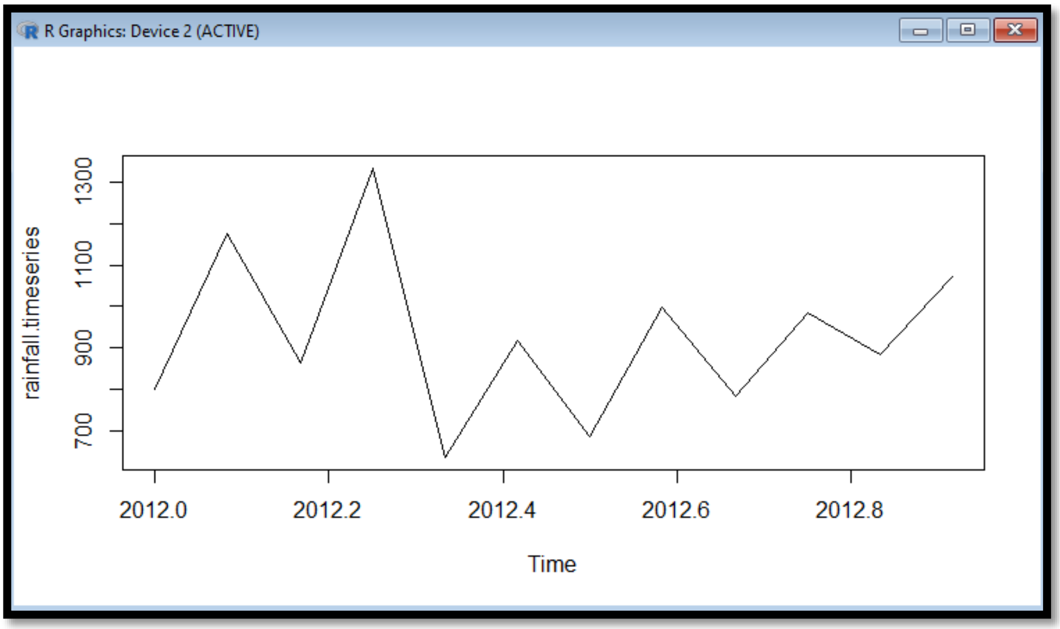
Code:

```
#Consider the annual rainfall details at a place starting from January 2012.
#We create an R time series object for a period of 12 months and plot it.

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

# Convert it to a time series object.
rainfall.timeseries <- ts(rainfall,start = c(2012,1),frequency = 12)

# Print the timeseries data.
print(rainfall.timeseries)

# Give the chart file a name.
png(file = "rainfall.png")

# Plot a graph of the time series.
plot(rainfall.timeseries)

# Save the file.
dev.off()
```

Output:



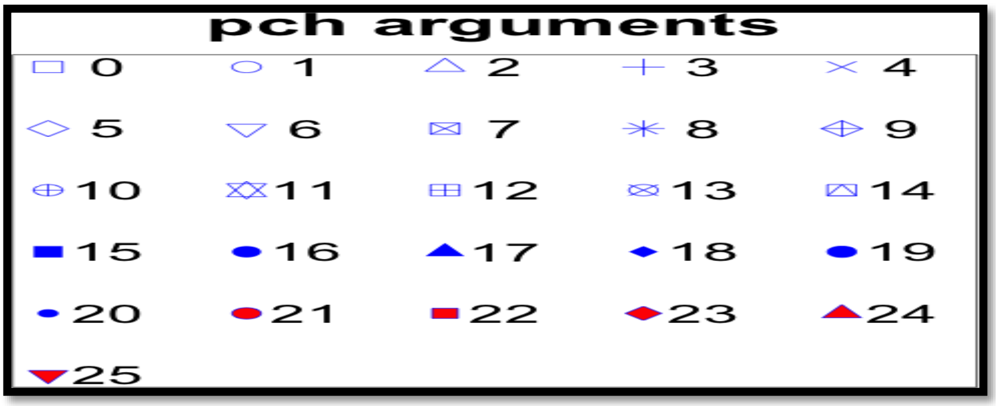
```
> source("C:\\Users\\Admin\\Desktop\\Sudip\\P7.R")
        Jan    Feb    Mar    Apr    May    Jun    Jul    Aug    Sep    Oct    Nov    Dec
2012  799.0 1174.8  865.1 1334.6  635.4  918.5  685.5  998.6  784.2  985.0  882.8 1071.0
> plot(rainfall.timeseries)
> |
```



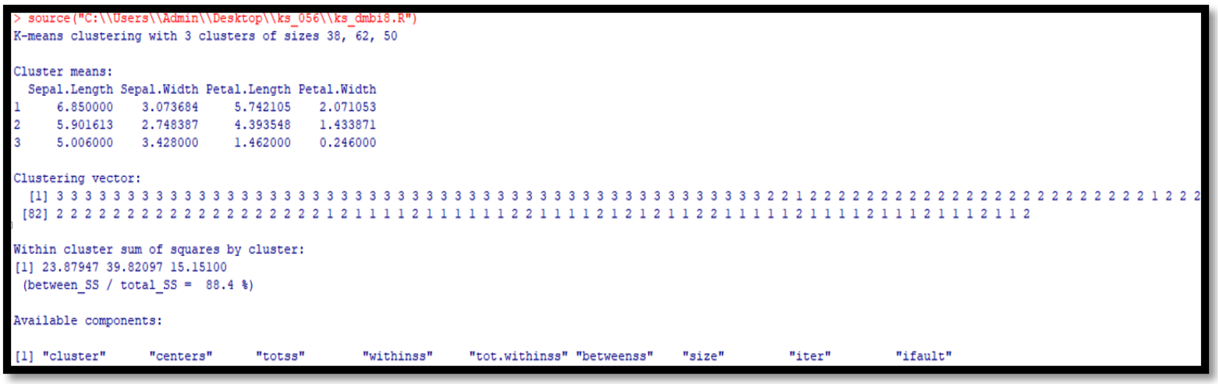
Practical No.8 Perform the Data Clustering using Clustering Algorithm(Clustering : k-means Algorithm)

Code:

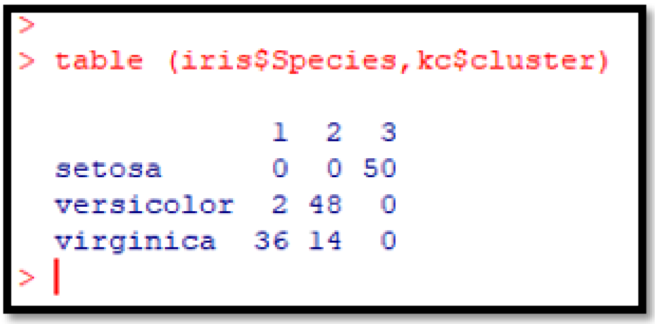
```
newiris <- iris
newiris$Species <- NULL
(kc <- kmeans(newiris,3))
print(kc)

# Compare the Species label with the clustering result.
table (iris$Species,kc$cluster)
plot(newiris[c("Sepal.Length","Sepal.Width")],col=kc$cluster)

points(kc$centers[,c("Sepal.Length","Sepal.Width")],col=1:3,pch=8,cex=2)
```



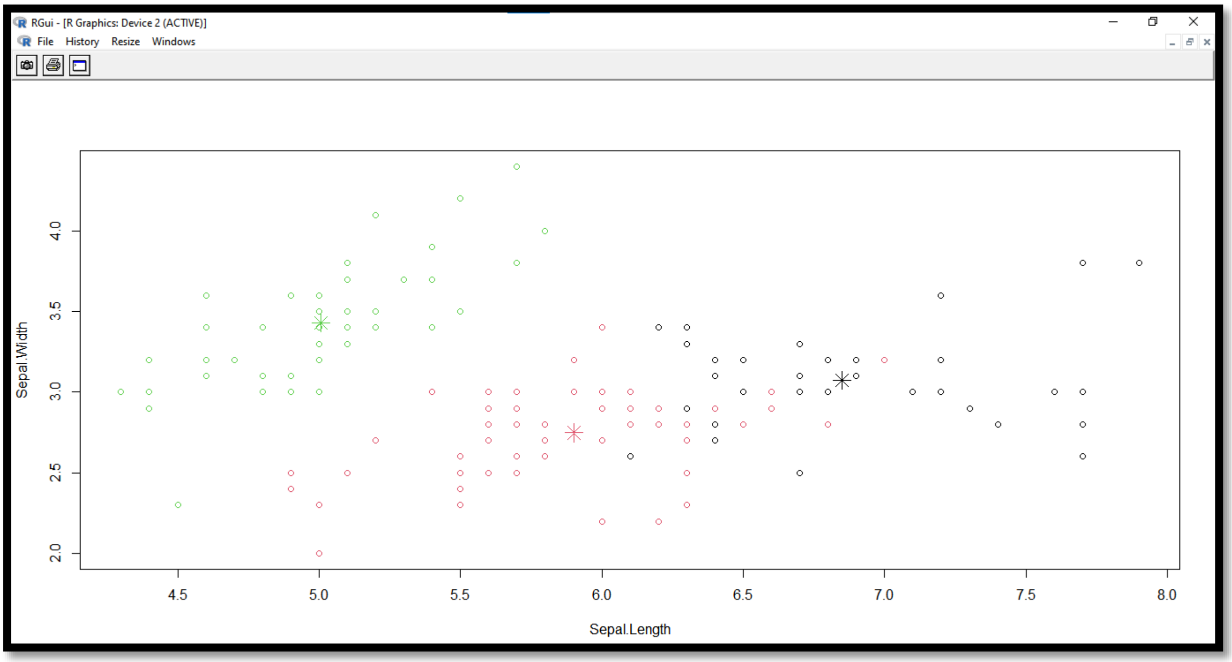
Output:



```
> source("C:\\Users\\Admin\\Desktop\\ks_056\\ks_dmbi8.R")
K-means clustering with 3 clusters of sizes 38, 62, 50

Cluster means:
  Sepal.Length Sepal.Width Petal.Length Petal.Width
1     6.850000    3.073684     5.742105    2.071053
2     5.901613    2.748387     4.393548    1.433871
3     5.006000    3.428000     1.462000    0.246000

Clustering vector:
  [1] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 2 2 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 1 2 2 2
 [82] 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 2 1 1 1 1 2 1 1 1 1 1 1 2 2 1 1 1 1 2 1 2 1 2 1 1 2 2 1 1 1 1 1 2 1 1 1 1 2 1 1 1 2 1 1 1 2 1 1 2

Within cluster sum of squares by cluster:
[1] 23.87947 39.82097 15.15100
 (between_SS / total_SS =  88.4 %)

Available components:

[1] "cluster"      "centers"      "totss"        "withinss"     "tot.withinss" "betweenss"    "size"         "iter"         "ifault"
```



```
>
> table (iris$Species,kc$cluster)

              1  2  3
  setosa      0  0 50
  versicolor  2 48  0
  virginica  36 14  0
> |
```

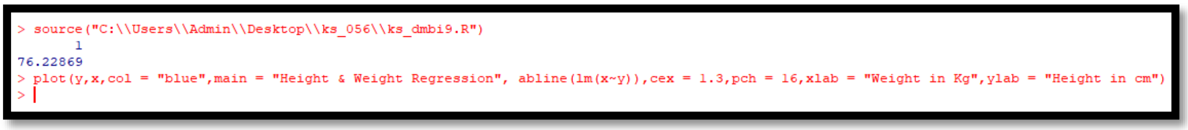

RGui - [R Graphics: Device 2 (ACTIVE)]
File
History
Resize
Windows
Sepal.Width
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0
Sepal.Length

Practical No.9 Perform the Linear regression on the given data warehouse data.

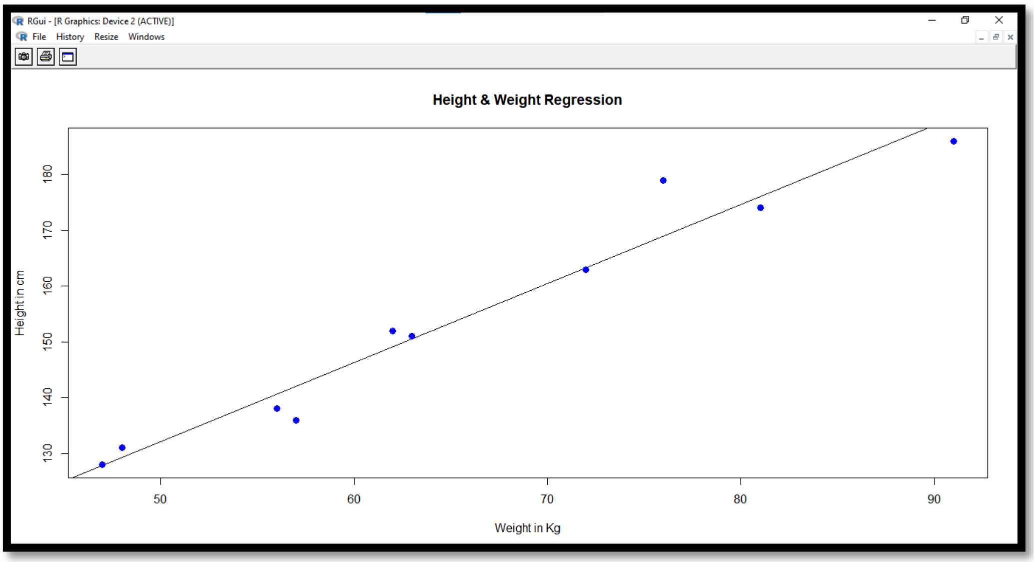
Code:

```
x <- c(151, 174, 138, 186, 128, 136, 179, 163, 152, 131)

y <- c(63, 81, 56, 91, 47, 57, 76, 72, 62, 48)

# Apply the lm() function. relation <- lm(y~x)

# Find weight of a person with height 170. a <- data.frame(x = 170)
result <- predict(relation,a) print(result)

# Give the chart file a name. png(file = "linearregression.png")
# Plot the chart.
plot(y,x,col = "blue",main = "Height & Weight Regression", abline(lm(x~y)),cex = 1.3,pch =
16,xlab = "Weight in Kg",ylab = "Height in cm")

# Save the file.
dev.off()
```

Output:



```
> source("C:\\Users\\Admin\\Desktop\\ks_056\\ks_dmbi9.R")
       1
76.22869
> plot(y,x,col = "blue",main = "Height & Weight Regression", abline(lm(x~y)),cex = 1.3,pch = 16,xlab = "Weight in Kg",ylab = "Height in cm")
> 
```

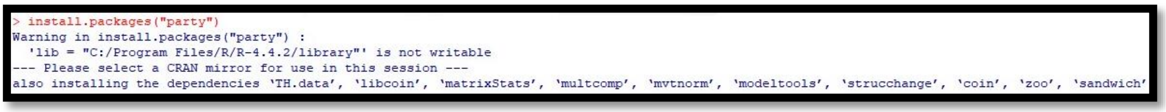


Practical No.9 Perform the Linear regression on the given data warehouse data.

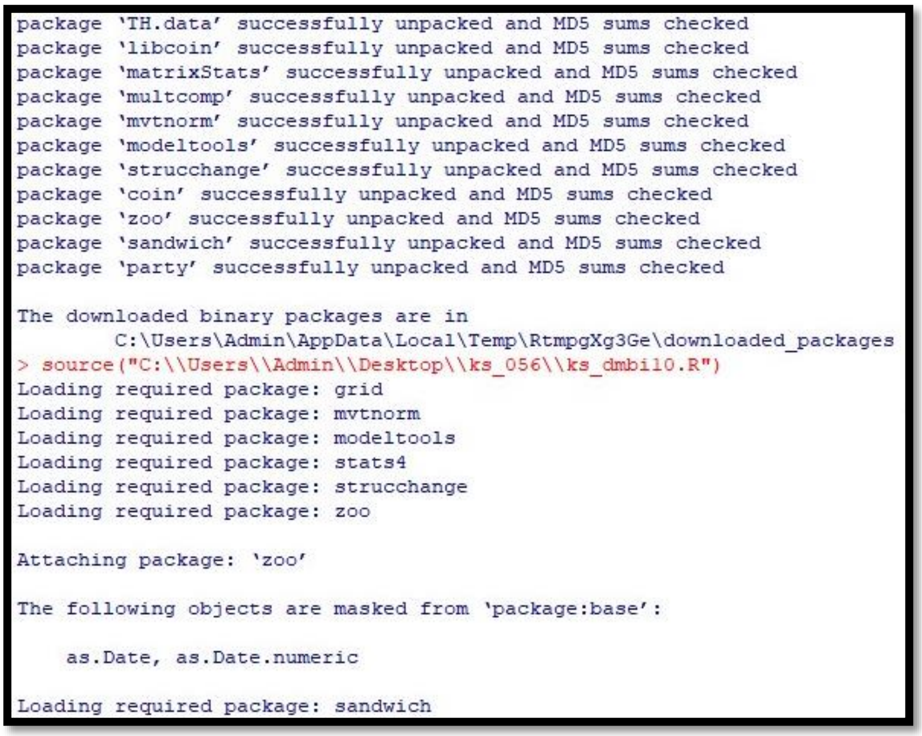
Code:

```
#Load the party package. It will automtically load other dependent packages.
library(party)

#create the input data frame
input.dat <- readingSkills[c(1:105),]

#Give the chart file a name
png(file = "decision_tree.png")

#create the tree
output.tree <- ctree(
nativeSpeaker ~ age + shoeSize + score,
data = input.dat)

#plot the tree
plot(output.tree)

#save the file
dev.off()
```

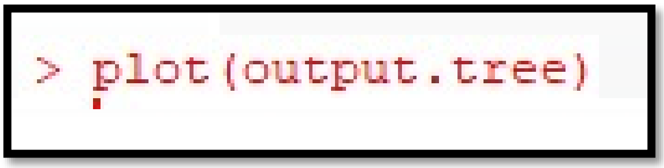
Output:



```
> install.packages("party")
Warning in install.packages("party") :
  'lib = "C:/Program Files/R/R-4.4.2/library"' is not writable
--- Please select a CRAN mirror for use in this session ---
also installing the dependencies ‘TH.data’, ‘libcoin’, ‘matrixStats’, ‘multcomp’, ‘mvtnorm’, ‘modeltools’, ‘strucchange’, ‘coin’, ‘zoo’, ‘sandwich’
```



```
package ‘TH.data’ successfully unpacked and MD5 sums checked
package ‘libcoin’ successfully unpacked and MD5 sums checked
package ‘matrixStats’ successfully unpacked and MD5 sums checked
package ‘multcomp’ successfully unpacked and MD5 sums checked
package ‘mvtnorm’ successfully unpacked and MD5 sums checked
package ‘modeltools’ successfully unpacked and MD5 sums checked
package ‘strucchange’ successfully unpacked and MD5 sums checked
package ‘coin’ successfully unpacked and MD5 sums checked
package ‘zoo’ successfully unpacked and MD5 sums checked
package ‘sandwich’ successfully unpacked and MD5 sums checked
package ‘party’ successfully unpacked and MD5 sums checked

The downloaded binary packages are in
        C:\Users\Admin\AppData\Local\Temp\RtmpgXg3Ge\downloaded_packages
> source("C:\\Users\\Admin\\Desktop\\ks_056\\ks_dmbi10.R")
Loading required package: grid
Loading required package: mvtnorm
Loading required package: modeltools
Loading required package: stats4
Loading required package: strucchange
Loading required package: zoo

Attaching package: ‘zoo’

The following objects are masked from ‘package:base’:

    as.Date, as.Date.numeric

Loading required package: sandwich
```



```
> plot(output.tree)
```