Implement clustering techniques – Hierarchical and K-Means

AIM:

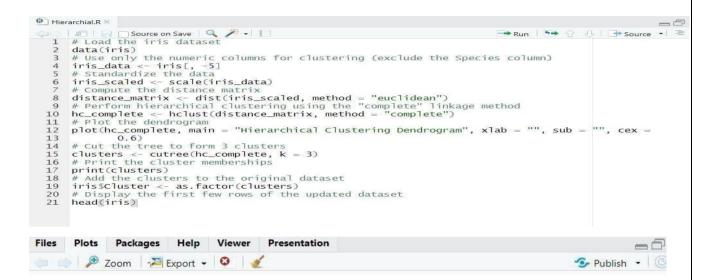
To Implement clustering techniques Hierarchical and K-Means using R programming in R Studio.

a) HIERARCHIAL CLUSTERING

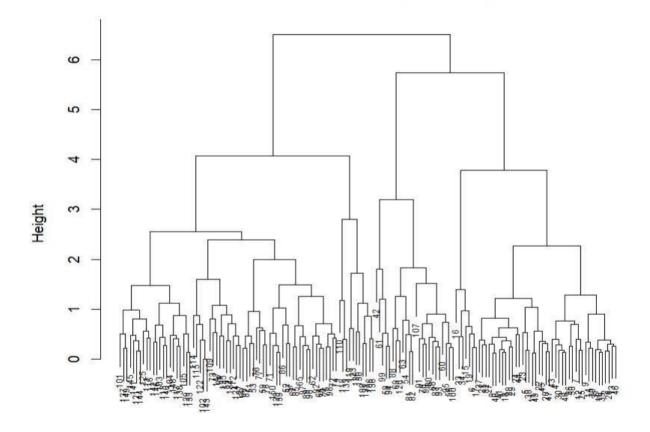
```
# Load the iris dataset data(iris)
# Use only the numeric columns for clustering (exclude the Species column) iris data <-
iris[, -5]
# Standardize the data iris scaled
<- scale(iris data)
# Compute the distance matrix distance matrix <- dist(iris scaled, method
= "euclidean")
# Perform hierarchical clustering using the "complete" linkage method hc complete <-
hclust(distance matrix, method = "complete")
# Plot the dendrogram plot(hc complete, main = "Hierarchical Clustering Dendrogram", xlab
= "", sub = "", cex =
0.6)
# Cut the tree to form 3 clusters clusters
<- cutree(hc complete, k = 3)
# Print the cluster memberships print(clusters)
# Add the clusters to the original dataset iris$Cluster
<- as.factor(clusters)
```

Display the first few rows of the updated dataset head(iris)

OUTPUT:

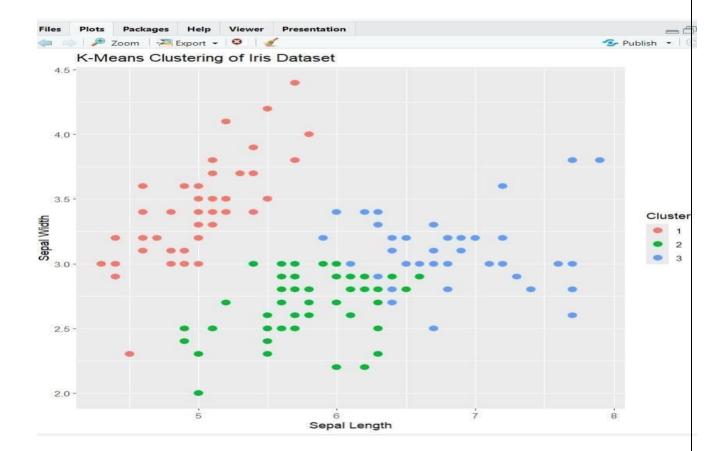


Hierarchical Clustering Dendrogram



b) K-MEANS CLUSTERING

```
# Load the iris dataset data(iris)
# Use only the numeric columns for clustering (exclude the Species column) iris data <-
iris[, -5]
# Standardize the data iris scaled
<- scale(iris data)
# Set the number of clusters set.seed(123)
# For reproducibility k < -3
# Number of clusters
# Perform K-Means clustering
kmeans result <- kmeans(iris scaled, centers = k, nstart = 25)
# Print the K-Means result
print(kmeans result)
# Print the cluster centers
print(kmeans result$centers)
# Add the cluster assignments to the original dataset iris$Cluster <-
as.factor(kmeans_result$cluster)
# Display the first few rows of the updated dataset head(iris)
# Plot the clusters library(ggplot2) ggplot(iris, aes(x = Sepal.Length, y = Sepal.Width, color =
Cluster)) + geom point(size = 3) + labs(title = "K-Means Clustering of Iris Dataset", x = "Sepal
Length", y = "Sepal Width") OUTPUT:
```



RESULT:

Thus, the Implement clustering techniques Hierarchical and K-Means using R programming in R Studio have been successfully executed.