Experiment no.:- 8

Aim:- Implementation of anyone Hierarchical clustering Method.

Objectives:- To create a clustering based on the Hierarchical clustering Method.

Theory:-

In data mining and statistics, hierarchical clustering analysis is a method of cluster analysis which seeks to build a hierarchy of clusters i.e. tree type structure based on the hierarchy.

Basically, there are two types of hierarchical cluster analysis strategies –

1. **Agglomerative Clustering:** Also known as bottom-up approach or hierarchical agglomerative clustering (HAC). A structure that is more informative than the unstructured set of clusters returned by flat clustering. This clustering algorithm does not require us to prespecify the number of clusters. Bottom-up algorithms treat each data as a singleton cluster at the outset and then successively agglomerates pairs of clusters until all clusters have been merged into a single cluster that contains all data.
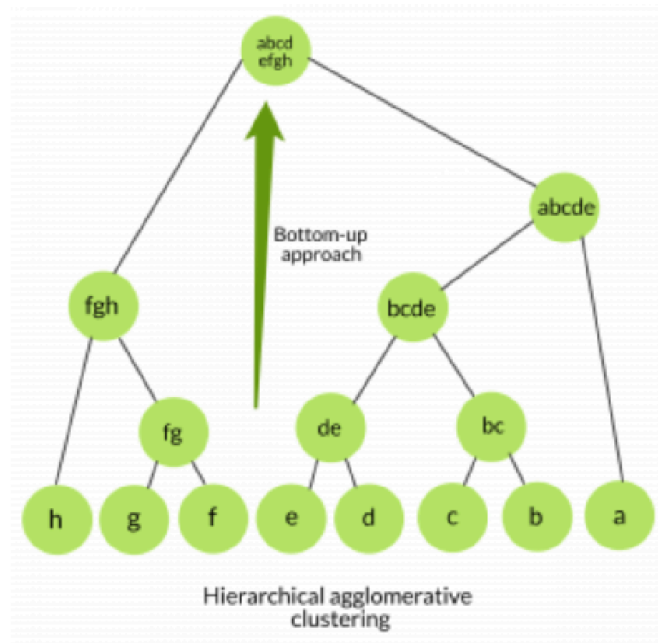
2. **Divisive clustering :** Also known as top-down approach. This algorithm also does not require to prespecify the number of clusters. Top-down clustering requires a method for splitting a cluster that contains the whole data and proceeds by splitting clusters recursively until individual data have been splitted into singleton cluster.

Hierarchical divisive
clustering
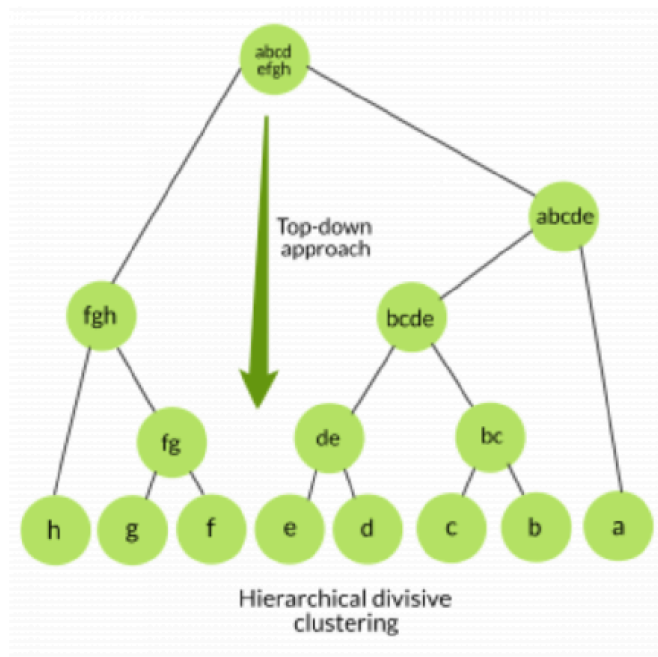
Python Implementation of Hierarchical Clustering Method

(Agglomerative Clustering)

from sklearn.cluster import AgglomerativeClustering
import numpy as np

# randomly chosen dataset
X = np.array([[1, 2], [1, 4], [1, 0],
[4, 2], [4, 4], [4, 0]])

# here we need to mention the number of clusters
# otherwise the result will be a single cluster
# containing all the data
clustering = AgglomerativeClustering(n_clusters = 2).fit(X)

# print the class labels
print(clustering.labels_)

Output:

[1, 1, 1, 0, 0, 0]

RESULT:

The practical outline of implementing the **Agglomerative Clustering** algorithm in python has been successfully completed.