**Title:** Design and implement given clustering algorithms.

**Objective/Aim:** To implement

1. Hierarchical clustering
2. K-Means
3. K-Medoids
4. DBSCAN

**Introduction:** This assignment is design and implementation of clustering algorithms.

**Theory/Algorithm:**

1. Hierarchical Clustering: Hierarchical clustering, also known as hierarchical cluster analysis, is an algorithm that groups similar objects into groups called clusters. The endpoint is a set of clusters, where each cluster is distinct from each other cluster, and the objects within each cluster are broadly similar to each other.
2. K-means: k-means clustering is a method of vector quantization, originally from signal processing, that aims to partition n observations into k clusters in which each observation belongs to the cluster with the nearest mean, serving as a prototype of the cluster.
3. K-medoids: Both the k-means and k-medoids algorithms are partitional (breaking the dataset up into groups) and attempt to minimize the distance between points labeled to be in a cluster and a point designated as the center of that cluster. In contrast to the k-means algorithm, k-medoids chooses actual data points as centers (medoids or exemplars), and thereby allows for greater interpretability of the cluster centers than in k-means, where the center of a cluster is not necessarily one of the input data points
4. BDSCAN: It is a density-based clustering non-parametric algorithm: given a set of points in some space, it groups together points that are closely packed together (points with many nearby neighbors), marking as outliers points that lie alone in low-density regions (whose nearest neighbors are too far away)

**Documentation/Block Diagrams:**

**Procedure:**

**Actual Experimentation/ simulation/ result/ Observation:**

**Conclusion:**

**References:**