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DEC Lab Assignment - 8

* Problem Statement

Consider a suitable dataset & apply different clustering techniques.

* Objectives :

- To build the cluster using different cluster techniques
- To implement the K-means & Hierarchical clustering
- To check the performance of clustering algorithm.

* Conclusion

In conclusion, the clustering is a powerful technique in machine learning that helps uncover hidden patterns & structures within datasets. Demonstrated their implementation using Python programming language & the sci-kit learn library.

* FAQ's

Q1) Differentiate between unsupervised & supervised learning?

Ans In supervised learning, the algorithm is trained on a labeled dataset, where the input data is paired with corresponding output labels. The goal is to learn a mapping from inputs to outputs, & the model makes predictions based on this learned mapping.

In unsupervised learning, the algorithm is given unlabeled data & must find patterns or relationships within the data without explicit guidance. The goal is often to discover the underlying structure or distribution of the data.

Q2) What is the purpose of using cluster analysis in data science?

Ans Cluster analysis in data science is used to group similar data points together on their inherent characteristics. The purpose is to uncover patterns, identify natural groupings, & gain insights into the structure of the data, facilitating tasks like segmentation, anomaly detection & pattern recognition.

Q3) What are the different types of clustering algorithms available?

Ans There are several types of clustering algorithms, including

1) K-Means Clustering
2) Hierarchical clustering.

3) DBSCAN (Density- Based Spatial Clustering of Applications with Noise)
4) Gaussian Mixture Models
5) Agglomerative Clustering
6) Affinity Propagation
7) Mean Shift Clustering
8) Self- Organizing Maps (SOM)