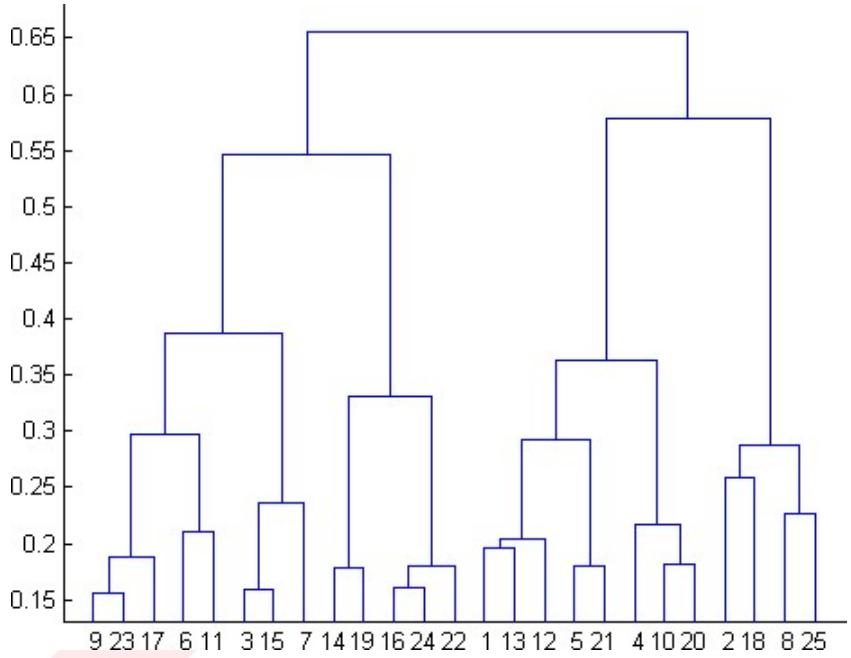
MACHINE LEARNING

Q1 to Q12 have only one correct answer. Choose the correct option to answer your question.

1. What is the most appropriate no. of clusters for the data points represented by the following dendrogram:



a) 2
b) 4
c) 6
d) 8

Ans: d) 8

2. In which of the following cases will K-Means clustering fail to give good results?
   1. Data points with outliers
   2. Data points with different densities
   3. Data points with round shapes
   4. Data points with non-convex shapes

   Options:
   a) 1 and 2
   b) 2 and 3
   c) 2 and 4
   d) 1, 2 and 4

Ans: d) 1, 2 and 4

3. The most important part of____is selecting the variables on which clustering is based.
   a) interpreting and profiling clusters
   b) selecting a clustering procedure
   c) assessing the validity of clustering
   d) formulating the clustering problem

Ans: d) formulating the clustering problem

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4. The most commonly used measure of similarity is the____or its square.
   a) Euclidean distance
   b) city-block distance
   c) Chebyshev's distance
   d) Manhattan distanc

Ans: a) Euclidean distance

5. _____is a clustering procedure where all objects start out in one giant cluster. Clusters are formed bydividing this cluster into smaller and smaller clusters.
   a) Non-hierarchical clustering
   b) Divisive clustering
   c) Agglomerative clustering
   d) K-means clustering

Ans: b) Divisive clustering

6. Which of the following is required by K-means clustering?
   a) Defined distance metric
   b) Number of clusters
   c) Initial guess as to cluster centroids
   d) All answers are correct

Ans: d) All answers are correct

7. The goal of clustering is to-
   a) Divide the data points into groups
   b) Classify the data point into different classes
   c) Predict the output values of input data points
   d) All of the above

Ans: d) All of the above

8. Clustering is a-
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning
   d) None

Ans: b) Unsupervised learning

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9. Which of the following clustering algorithms suffers from the problem of convergence at local optima?
   a) K- Means clustering
   b) Hierarchical clustering
   c) Diverse clustering
   d) All of the above

Ans: a) K- Means clustering

10. Which version of the clustering algorithm is most sensitive to outliers?
   a) K-means clustering algorithm
   b) K-modes clustering algorithm
   c) K-medians clustering algorithm
   d) None

Ans: a) K-means clustering algorithm

11. Which of the following is a bad characteristic of a dataset for clustering analysis-
   a) Data points with outliers
   b) Data points with different densities
   c) Data points with non-convex shapes
   d) All of the above

Ans: d) All of the above

12. For clustering, we do not require-
   a) Labeled data
   b) Unlabeled data
   c) Numerical data
   d) Categorical data

Ans: a) Labeled data

Q13 to Q15 are subjective answers type questions, Answers them in their own words briefly.

13. How is cluster analysis calculated?

Ans: The cluster analysis follows three basic steps:

1) calculate the distances

2) link the clusters

3) choose a solution by selecting the right number of clusters.

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14. How is cluster quality measured?

Ans: Cluster cohesion: Measures the closeness of the objects within the same cluster. A “lower within-cluster” variation indicates good compactness or good clustering. The separation method is implied to measure how well a cluster is separated from other clusters. The quality of a good clustering result is determined by the similarity measures used by the clustering method and its execution. The quality of any type of clustering method is a measure of its ability to find the hidden patterns.

15. What is cluster analysis and its types?

Ans: Cluster analysis is the task of grouping a set of data points in such a way that they can be characterized by their relevancy to one another. These techniques create clusters that allow us to understand how our data is related. The most common applications of cluster analysis in a business setting is to segment customers or activities.

Types of cluster analysis

1. Centroid Clustering
2. Density Clustering
3. Distribution Clustering
4. Connectivity Clustering

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16. W

Ans: a) Labeled data