MACHINE LEARNING(Worksheet-3)

Question-1-Which of the following is an application of clustering?

a. biological network analysis

b. Market trend prediction

c. Topic modelling

d. All of the above

Answer- d) All of the above

Question-2- On which data type, we cannot perform cluster analysis?

a. Time series data

b. Text data

c. Multimedia data

d. None

Answer- d) None

Question- 3- Netflix's movie recommendation system uses

a. Supervised learning

b. Unsupervised learning

c. Reinforcement learning and Unsupervised learning

d. All of the above

Answer-3 c) Reinforcement learning and Unsupervised learning

Question-4- The final output of Hierarchical clustering is-

a. The number of cluster centroids

b. The tree representing how close the data points are to each other

c. A map defining the similar data points into individual groups

d. All of the above

Answer- b) The tree representing how close the data points are to each other

Question-5- Which of the step is not required for K-means clustering?

a. A distance metric

b. Initial number of clusters

c. Initial guess as to cluster centroids

d. None

Answer- d) None

Question-6- Which is the following is wrong?

a. k-means clustering is a vector quantization method

b. k-means clustering tries to group n observations into k clusters

c. k-nearest neighbour is same as k-means

d. None

Answer- c) k-nearest neighbour is same as k-means

Question-7- Which of the following metrics, do we have for finding dissimilarity between two clusters in hierarchical clustering?

i. Single-link

ii. Complete-link

iii. Average-link Options:

a.1 and 2

b. 1 and 3

c. 2 and 3

d. 1, 2 and 3

Answer- d) 1,2 and 3

Question- 8 Which of the following are true?

i. Clustering analysis is negatively affected by multicollinearity of features

ii. Clustering analysis is negatively affected by heteroscedasticity

Options:

a. 1 only

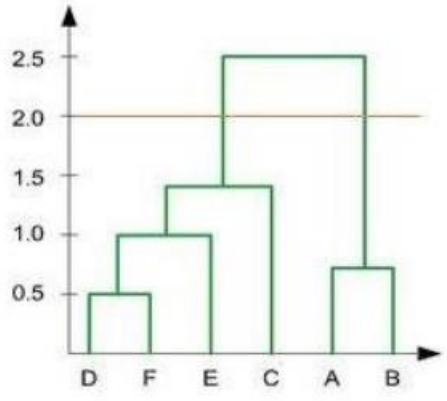
b. 2 only

c. 1 and

2 d. None of them

Answer- a) 1 only

Question- 9 In the figure above, if you draw a horizontal line on y-axis for y=2. What will be the number of clusters formed?



a. 2

b. 4

c. 3

d. 5

Answer- a) 2

Question-10 For which of the following tasks might clustering be a suitable approach?

a. Given sales data from a large number of products in a supermarket, estimate future sales for each of these products.

b. Given a database of information about your users, automatically group them into different market segments.

c. Predicting whether stock price of a company will increase tomorrow.

d. Given historical weather records, predict if tomorrow's weather will be sunny or rainy.

Answer- a) Given sales data from a large number of products in a supermarket, estimate future sales for each of these products.

Question-11 Given, six points with the following attributes:

point	x coordinate	y coordinate
p1	0.4005	0.5306
p2	0.2148	0.3854
p3	0.3457	0.3156
p4	0.2652	0.1875
p5	0.0789	0.4139
p6	0.4548	0.3022

Table : X-Y coordinates of six points.

	p1	p2	p3	p4	p5	p6
p1	0.0000	0.2357	0.2218	0.3688	0.3421	0.2347
p2	0.2357	0.0000	0.1483	0.2042	0.1388	0.2540
p3	0.2218	0.1483	0.0000	0.1513	0.2843	0.1100
p4	0.3688	0.2042	0.1513	0.0000	0.2932	0.2216
p5	0.3421	0.1388	0.2843	0.2932	0.0000	0.3921
p6	0.2347	0.2540	0.1100	0.2216	0.3921	0.0000

Table : Distance Matrix for Six Points

Which of the following clustering representations and dendrogram depicts the use of MIN or Single link proximity function in hierarchical clustering:

Answer- a

Question-12 Given, six points with the following attributes:

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p6	0.2347	0.2540	0.1100	0.2216	0.3921	0.0000

Table : Distance Matrix for Six Points

Which of the following clustering representations and dendrogram depicts the use of MAX or Complete link proximity function in hierarchical clustering.

Answer- b

Question-13 What is the importance of clustering?

Answer- They can cluster different customer types into one group based on different factors, such as purchasing patterns. The factors analysed through clustering can have a big impact on sales and customer satisfaction, making it an invaluable tool to boost revenue, cut costs, or sometimes even both.

Question-14 How can I improve my clustering performance?

Answer- Graph-based clustering performance can easily be improved by applying ICA blind source separation during the graph Laplacian embedding step. Applying unsupervised feature learning to input data using either RICA or SFT, improves clustering performance.