MACHINE LEARNING

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

1. Which of the following is an application of clustering?
   a. Biological network analysis
   b. Market trend prediction
   c. Topic modeling
   d. All of the above

   ANSWER: d) All of the above

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

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: c) Reinforcement learning and Unsupervised learning

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

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

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

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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

8. Which of the following are true?

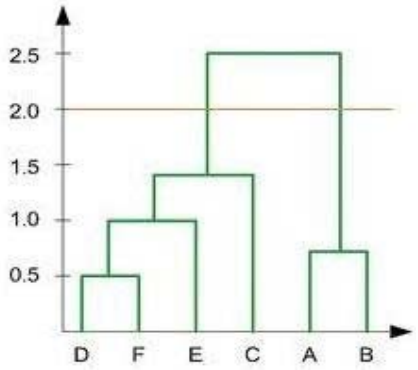
i. Clustering analysis is negatively affected by multicollinearity of features
ii. Clustering analysis is negatively affected by heteroscedasticity

Options:

a. 1 only
b. 2 only
c. 1 and 2
d. None of them

ANSWER: a) 1 only

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

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

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

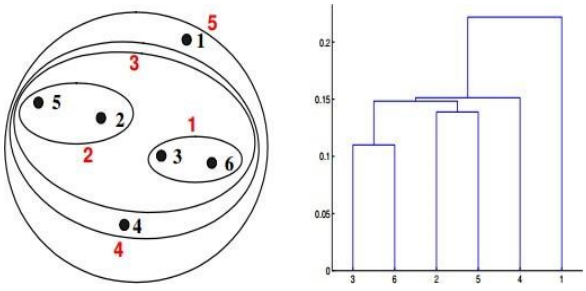
Table : X-Y coordinates of six points.

	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

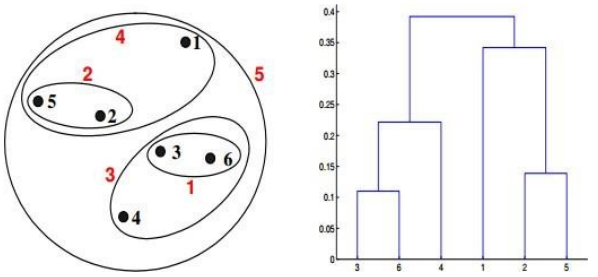
Which of the following clustering representations and dendrogram depicts the use of MIN or Single link proximity function in hierarchical clustering:

a.

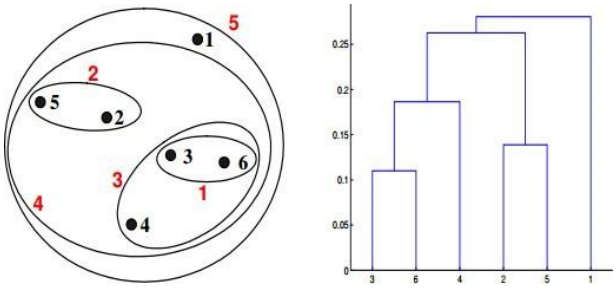


MACHINE LEARNING

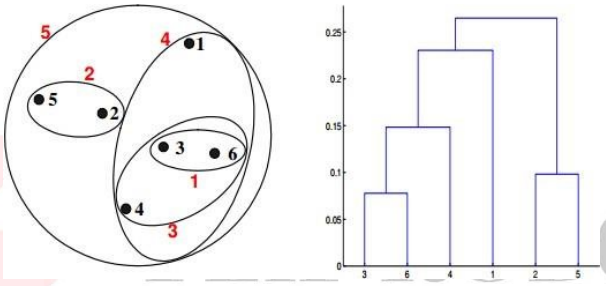
b.



c.



d.



ANSWER: a

12. Given, six points with the following attributes:

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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

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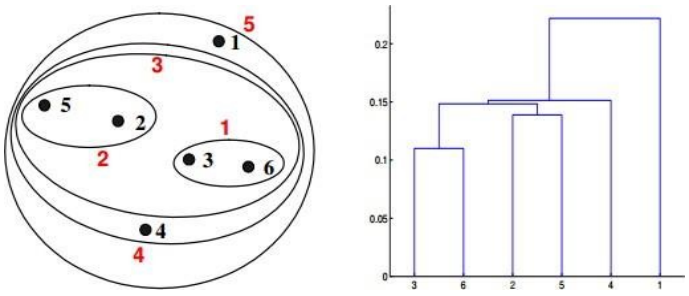
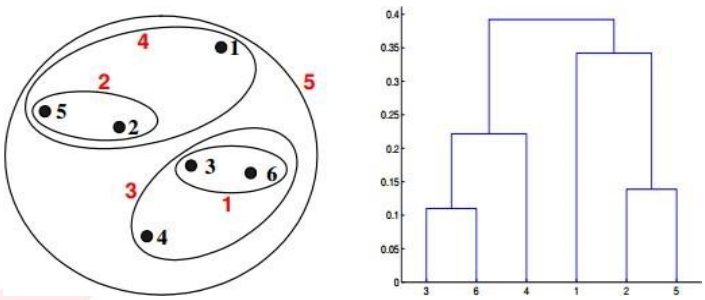
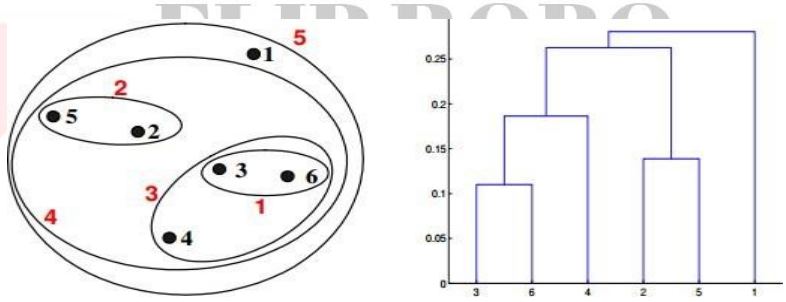
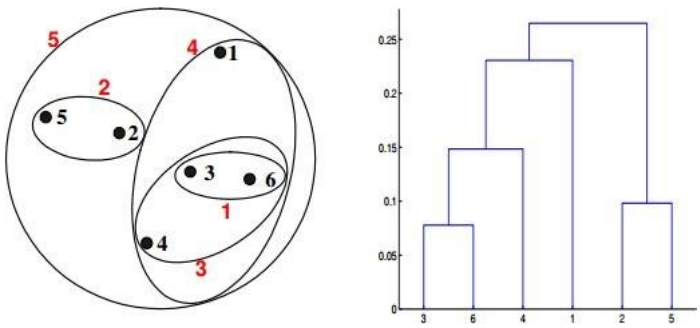
Which of the following clustering representations and dendrogram depicts the use of MAX or Complete link proximity function in hierarchical clustering.

a. 

b. 

c. 

d. 

ANSWER: b

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Q13 to Q14 are subjective answers type questions, Answers them in their own words briefly

13. What is the importance of clustering?

ANSWER: Clustering is the process of grouping data items that are "similar" to each other and data items that are "dissimilar" to each other in other clusters.

Clustering divides records into many clusters of similar records and automatically understands data groupings.

Therefore, the main purpose of clustering is to isolate behaviorally similar groups and group them into different clusters.

It is very difficult for a machine to recognize oranges and apples unless it has to be trained on a large relevant dataset. This training is done using unsupervised machine learning algorithms. B. Clustering.

14. How can I improve my clustering performance?

ANSWER: Oversight of cluster coordination at the national and local levels is necessary to ensure that the cluster:

- Efficient and effective coordination mechanism
- Satisfy the core functionality of the cluster
- Supporting efficient delivery of related services
- Meeting the needs of cluster members and being accountable to those affected
- Monitoring also ensures that the coordination architecture is responsive to changing context and coordination needs.