MACHINE LEARNING

Answers:

1. Which of the following is an application of clustering?
d. All of the above

2. On which data type, we cannot perform cluster analysis?
d. None

3. Netflix's movie recommendation system uses-
c. Reinforcement learning and Unsupervised learning

4. The final output of Hierarchical clustering is-
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?
d. None

6. Which is the following is wrong?
c. k-nearest neighbour is same as k-means

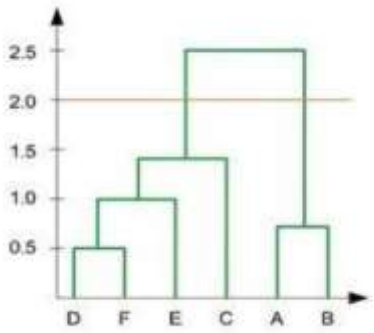
7. Which of the following metrics, do we have for finding dissimilarity between two clusters in hierarchical clustering?
i. Single-link
ii. Complete-link
iii. Average-link

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

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

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

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

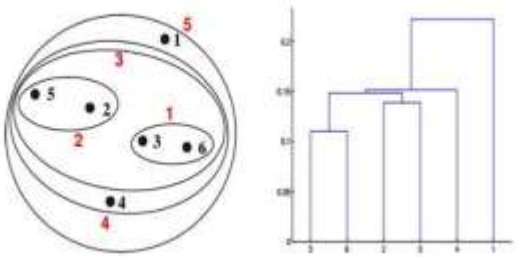
Table : X-Y coordinates of six points.

	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:

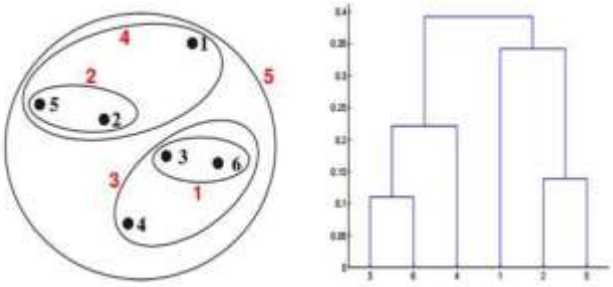
a.



12. Given, six points with the following attributes:

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

b.



13. What is the importance of clustering?

Answer: Clustering is used to identify groups of similar objects in datasets with two or more variable quantities. In practice, this data may be collected from marketing, biomedical, or geospatial databases, among many other places. It is important in data analysis and data mining applications.

14. How can I improve my clustering performance?

Answer: K-means clustering algorithm can be significantly improved by using a better initialization technique and re-starting the algorithm. When the data has overlapping clusters, k-means can improve the results of the initialization technique.
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.