

MACHINE LEARNING

Q1 to Q11 have only one correct answer. Choose the correct option to answer your question.

1. Movie Recommendation systems are an example of:

- i) Classification
- ii) Clustering
- iii) Regression

Options:

- a) 2 Only
- b) 1 and 2
- c) 1 and 3
- d) 2 and 3

Answer- a) 2 Only

2. Sentiment Analysis is an example of:

- i) Regression
- ii) Classification
- iii) Clustering
- iv) Reinforcement

Options:

- a) 1 Only
- b) 1 and 2
- c) 1 and 3
- d) 1, 2 and 4

Answer = d) Regression, Classification and Reinforcement.

3. Can decision trees be used for performing clustering?

- a) True
- b) False

Answer = a) True

4. Which of the following is the most appropriate strategy for data cleaning before performing clustering analysis, given less than desirable number of data points:

- i) Capping and flooring of variables
- ii) Removal of outliers

Options:

- a) 1 only
- b) 2 only
- c) 1 and 2
- d) None of the above

Answer = a) Capping and flooring of variables.

5. What is the minimum no. of variables/ features required to perform clustering?

- a) 0
- b) 1
- c) 2
- d) 3

Answer = b) 1

6. For two runs of K-Mean clustering is it expected to get same clustering results?

- a) Yes
- b) No

Answer = b) No.

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7. Is it possible that Assignment of observations to clusters does not change between successive iterations in K-Means?
- a) Yes
 - b) No
 - c) Can't say
 - d) None of these

Answer = a) Yes

8. Which of the following can act as possible termination conditions in K-Means?
- i) For a fixed number of iterations.
 - ii) Assignment of observations to clusters does not change between iterations. Except for cases with a bad local minimum.
 - iii) Centroids do not change between successive iterations.
 - iv) Terminate when RSS falls below a threshold.

Options:

- a) 1, 3 and 4
- b) 1, 2 and 3
- c) 1, 2 and 4
- d) All of the above

Answer = d) All of the above

9. Which of the following algorithms is most sensitive to outliers?
- a) K-means clustering algorithm
 - b) K-medians clustering algorithm
 - c) K-modes clustering algorithm
 - d) K-medoids clustering algorithm

Answer = a) K-means clustering algorithm

10. How can Clustering (Unsupervised Learning) be used to improve the accuracy of Linear Regression model (Supervised Learning):
- i) Creating different models for different cluster groups.
 - ii) Creating an input feature for cluster ids as an ordinal variable.
 - iii) Creating an input feature for cluster centroids as a continuous variable.
 - iv) Creating an input feature for cluster size as a continuous variable.

Options:

- a) 1 only
- b) 2 only
- c) 3 and 4
- d) All of the above

Answer = d) All of the above

11. What could be the possible reason(s) for producing two different dendrograms using agglomerative clustering algorithms for the same dataset?
- a) Proximity function used
 - b) of data points used
 - c) of variables used
 - d) All of the above

Answer = d) All of the above

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Q12 to Q14 are subjective answers type questions, Answers them in their own words briefly

12. Is K sensitive to outliers?

Answer- K-means clustering algorithm is sensitive to outliers because a means is easily influenced by extreme values.

The k-means algorithm updates the cluster centers by taking the average of all the data points that are closer to each cluster center. When all the points are packed nicely together, the average makes sense. However, when you have outliers, this can affect the average calculation of the whole cluster.

13. Why is K means better?

Answer- K Means clustering is found to work well when the structure of the clusters is hyper spherical (like circle in 2D, sphere in 3D). It gives image classification results that are competitive with much more complex / intimidating deep neural network models. In fact, a lot of k-means applications are now done using support vector machines.

- **It gives good results**
- **It is already implemented in the software**
- **Number of clusters has to be fixed before**
- **Dependent of the initialisation parameters and the chosen distance**

14. Is K means a deterministic algorithm?

Answer- One of the significant drawbacks of K-Means is its non-deterministic nature.
