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

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

3. Can decision trees be used for performing clustering?
   a) True
   b) False

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

5. What is the minimum no. of variables/ features required to perform clustering?
   a) 0
   b) 1
   c) 2
   d) 3

6. For two runs of K-Mean clustering is it expected to get same clustering results?
   a) Yes
   b) No

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

MACHINE LEARNING

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 witha 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

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

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

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

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

12. Is K sensitive to outliers?
13. Why is K means better?
14. Is K means a deterministic algorithm?

12.Because the mean, as a statistic, is generally sensitive to outliers.

The mean of 2,2,2,3,3,3,4,4,4 is 3

If we add a single 23 to that, the mean becomes 5, which is larger than any of the other values.

Since in k-means, you'll be taking the mean a lot, you wind up with a lot of outlier-sensitive calculations.

That's why we have the k-medians algorithm. It just uses the median rather than the mean and is less sensitive to outliers.

13. K is positive integer number
The grouping is done by minimizing the sum of squares of distances between data and the corresponding cluster centroid.
K-means is most widely used clustering technique in the industry and computes really fast when compared to other techniques

14.The basic k-means clustering is based on a non-deterministic algorithm. i.e running the algorithm multiple times on the same data, could give different results.