**Assignment\_24**

1.What is your definition of clustering? What are a few clustering algorithms you might think of?

**Ans: Clustering is a Machine Learning technique that involves the grouping of data points. Given a set of data points, we can use a clustering algorithm to classify each data point into a specific group.**

**Algorithms: K-means , BIRCH , Mean shift**

2. What are some of the most popular clustering algorithm applications?

**Ans: Clustering analysis is broadly used in many applications such as market research, pattern recognition, data analysis, image processing**.

3. When using K-Means, describe two strategies for selecting the appropriate number of clusters.

**Ans: The optimal number of clusters can be defined as follow : Compute clustering algorithm for different values of k. for instance, by varing k from 1 to 10 clusters. For each k, calculate the total within-cluster sum of square.**

4. What is mark propagation and how does it work? Why would you do it, and how would you do it?

**Ans: Back – propagation is the essence of neural net training. It is the practice of fine-tuning the weights of a neural net based on the error rate obtained in the previous epoch.**

**Proper tuning of the weights ensure lower rates, making the model reliable by increasing its grnrralization.**

5. Provide two examples of clustering algorithms that can handle large datasets. And two that look for high-density areas?

**Ans: CLARA (clustering large applications) , k-means**

6. Can you think of a scenario in which constructive learning will be advantageous? How can you go about putting it into action?

**Ans: Prompt students to formulate their own questions(inquiry) allow multiple interpretation and expressions of learning of (multiple intelligences) encourage group work and the use of peers as resources.**

7. How do you tell the difference between anomaly and novelty detection?

**Ans: Anomaly is a process of finding those rare items, data points, events, or observation that make suspicious by being different from the rest data points or observation.**

**Novelty detection is the task of classifying test data that differ in some respect from data that are available during training.**

8. What is a Gaussian mixture, and how does it work? What are some of the things you can do about it?

**Ans: Gaussiam mixture is a function that is comprised of several Gaussians, each identified by k c- {1,….K}, where K is the number of clusters of our dataset. Gaussian k in the mixture is compreised of the following parameter: A mean u that defines its center**

9. When using a Gaussian mixture model, can you name two techniques for determining the correct number of clusters?