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

Ans: **Clustering algorithms are used to create groups based on similarities between data points. Points having similarities are placed within the same cluster. Some of the used algorithms in clustering are K-means, Hierarchial Clustering and DBScan Clustering.**

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

Ans: **creating recommendation system based on certain aspect about customer such as creating clusters based on customer’s language or region.**

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

Ans: **Elbow Method: this is used to select the optimal value of K by finding WCSS value for each K value and see it is changing abruptly to be able to select the K value. Another method is gap statistic method**

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

Ans: **Unfortunately couldn’t find anything related to Mark propagation on the internet.**

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

Ans: **K-means and Hierarichal clustering can be used to handle large datasets and DBScan or Density based clustering can be used for high-density areas.**

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

Ans:

**Constructivism theory states that there is no human-independent reality and knowledge is acquired individually. It argues that learning, knowledge and understanding are constructive process that build on prior knowledge. The ability to acquire new skills by modifying existing ones is the primary advantage of constructivist approaches over non-constructivist approaches. One of the examples is mind map where prior information can be used to build new understanding.**

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

Ans:

**Novelty detection is when you have new data (i.e. OOD) and you want to know whether or not it is in-distribution. You want to know if it looks like the data you trained on. Anomaly detection is when you test your data to see if it is different than what you trained the model.**

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

Ans:

**Gaussian Mixture models are used for representing Normally Distributed subpopulations within an overall population. The advantage of Mixture models is that they do not require which subpopulation a data point belongs to. It allows the model to learn the subpopulations automatically. This constitutes a form of unsupervised learning.**

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

Ans: **BIC and AIC**