2 Marks

1. Manifold learning:

→ Its a subset of machine learning based on the assumption that once observed data lies in a low dimensional manifold embedded in a high dimensional space.

→ Manifold learning is an approach to non-linear dimentionality reduction.

2. Metric learning:

→ Its a non-negitive function between 2 points x and y i.e distance between 2 points.

Types: 1. enclanian distance
2. discrete metric
3. Mahalanobis distance metric

properties: 1. non negitivity
2. Triangular inequality
3. symmetry.

3. Batch normalization:

→ It is a technique for training very deep neural networks that normalizes the contributions to a layer for every mini-batch.

→ It is a technique done between the layers of a Neural network instead of in the raw data.

4. Hyper parameter optimization:

→ There are numerous parameters and layers in Deep neural networks. calculating them and training the network with the parameters are difficult.

→ Hence, we need to optimize the hyper parameters

→ the hyper parameters to be optimized are

1. learning rate
2. Number epochs
3. Batch size
4. Activation function
5. Number of hidden layers and units
6. weight initialization
7. Dropout

5. • Yes, in autoencoders the output and input are the same
• First the input passes through the encoder, which produces the code
• then, the decoder produces the output using only this code
• the goal is to generate an output similar to the input

6. Feature reduction techniques

1. Feature selection : • filter
• wrapper
• embedded

2. feature extraction : PCA
LDA
QDA

7. Activation functions:

Soft max: It converts a vector of k real numbers into a probability distribution of k possible outcomes.

Relu: (Rectified linear unit)

In a neural network this activation function is responsible for transforming the summed weighted input from the node into the activation of node.