1.1 What is the key difference between narrow AI and general AI ?

A Narrow AI or Weak AI is designed for specific task with a limited Domain. while general AI or Strong AI aims to Exibit human like Intelligence. Across Various Domains.

1.2 Define Machine learning. Write Various types of Machine learning

A Machine learning enables systems to learn from Data and Improve with out being explicit. Machine learning types Includes supervised, unsupervised Semi Supervised and Reinforced

1.3 What is Scikit-learn?

A Scikit-learn is a Python library for Machine learning that Provide tools for data mining and analysis

1.4 Write the Importance of data augmentation ?

A Data Augmentation Increases the diversity and Quantity of training Data mitigating over fitting Improving model Perfomence.

1.5 What is classification in Machine Learning ?

A classification Predicts Catogerical class labels based on the Past observation Involving training a model on labeled Data to learn Patterns and make Predictions

1.6 What is K-Nearest Neighbors (KNN) used for?

A K-Nearest Neighors predicts by finding the closest data points to a given Point. Its used for classification and Regression, especially when data is non-linear or has no clear distribution

1.8 Write any 4 advantages of using Regression over traditional linear Regression methods?

A
- Robustness to outliers is some what less compared to traditinal linear regression Methods.
- Capability to handle moderatly non-linear relationships.
- Moderate Perfomance with high-dimensional data.
- Flexibility in parameter tuning and kernel selection, albeit with some constrains

1.9 What is the primary objective of unsupervised learning Algorithm?

A The Primary objective of unsupervised learning is to uncover Patterns in data with out explicit labels. while It may misIntrepret data at times. It aids in understanding underlying properties and tasks like clustering.

1.10 What is Q-learing, how does it work in reinforcement learning?

A Q-learning is a reinforcement learning algorithm where agents learn to make decisions by updating Q-values. The explore the environment, balencing between trying new actions and exploiting known ones.

2.1 What are Intelligent Agents in the context of AI, and how do they function

A Intelligent agents in AI Perceive their environment make decision, and take actions to acheive goals. They function by perceiving the environment through sensors, reasoning and deciding on actions, and then executing those actions. Additionally, they can learn and adapt from their interactions with the environment to improve decision-making over time.

2.2 Write a short note on over fitting and under fitting with example ?

A Over fitting : occur when a model capture noise or random fluctuation in the training data, leading to Poor generalization to unseen data

Underfitting : Happens when a model is too simplictic to capture the underlying structure of the data, resulting in Poor Perfomence on both training and unseen data.

Balancing between overfitting and underfitting is crucial for developing model that generazie well and perform optically.

2.5 Define Regression with types?

A Regression is a statistical method used to understand the Predict relationship between Variables

Types of regression Includes:

1) linear Regression
2) Logistic Regression
3) Polynomial Regression.

2.6 Explain The Working of KNN?

A K-Nearest Neighbor (KNN) is a simple algorithm for classification and Regression. During training, It Stores all data Points with labels or outcomes. When Predicting for a new Point, KNN Find the K nearest and use them to determine the Point's label or outcome. The choice of K is Important and depends on the Problem. While KNN is easy to understand, It can be slow for large dataset and Sensitive to the distance metrics Used

3.1 Explain knowledge Representation and its Various approach of knowledge Repre sentation.

A Knowledge representation in AI Involves organizing and Storing Information for computation Purpose

1. Sementic Networks
2. Frames
3. Rule-based System
4. logic-based Representation
5. Neural Networks

3.2 Explain the difference between Labeled Data and Unlabeled Data In Machine learning.

A Labeled Data Unlabeled Data are two types of datasets Commonly used In Machine learning

1. labeled Data
   - labeled Data consist of Input data Points Paired with Corresponding output labels or target Values.
   - Each data Points in labeled data is associated with a known outcome or category, making It Supervised learning Data

2. Unlabeled Data
   - Unlabeled data Consist of Input data Points Without any Corresponding output labels or target Values
   - Each data Point in Unlabeled data lack explicits information about Its Category or Outcome, making it Unsupervised learning data

3.4 Explain how Nonlinear SVM Works and what make It diffrent From regular SVM?

A Linear SVM is a Varient of regular SVM that exclusively works with data sets containing only one Feature. Unlike regular SVM. which Can handle multi-dimensional feature space. This Make linear SVM Particularly efficient For dataset with high dimensional features, as It eliminates the need for complex optimization algorithms. However, this approch sacrifise accuracy in favor of computational

lower performence on datasets with Intricate Patterns or non-linear relationships between features.