ASSIGNMENT - 1

1. What does one mean by the term “machine learning”?

Ans: It's a field of artificial intelligence that focuses on creating systems that can learn and improve from experience without being explicitly programmed. Essentially, it's about building algorithms that enable computers to learn patterns and make decisions based on data.

2.Can you think of 4 distinct types of issues where it shines?

Ans: Distinct Issues Where Machine Learning Shines:

* Image Recognition: Identifying objects, faces, or patterns within images.
* Natural Language Processing (NLP): Understanding and processing human language, such as sentiment analysis, language translation, or chatbots.
* Recommendation Systems: Predicting user preferences, like in movie recommendations or product suggestions.
* Predictive Analytics: Forecasting future trends or outcomes based on historical data, applied in finance, healthcare, and many other fields.

3.What is a labeled training set, and how does it work?

Ans: It's a dataset used in supervised learning that consists of input-output pairs. Each input has a corresponding label or output attached to it. For instance, in a dataset for recognizing handwritten digits, the images of digits are inputs, and the labels would be the actual digit they represent. It works by training a model on this set, allowing it to learn the relationship between inputs and outputs.

4.What are the two most important tasks that are supervised?

Ans: Classification and Regression are two fundamental supervised learning tasks.

* Classification: Assigning inputs into categories or classes. For example, email spam detection (classifying emails as spam or not).
* Regression: Predicting continuous values. For instance, predicting house prices based on features like area, location, etc.

5.Can you think of four examples of unsupervised tasks?

Ans: Examples of Unsupervised Tasks:

* Clustering: Grouping similar data points together without predefined categories.
* Dimensionality Reduction: Reducing the number of features while retaining essential information.
* Anomaly Detection: Identifying unusual patterns in data that do not conform to expected behavior.
* Association Rule Learning: Discovering interesting relations between variables in large datasets, like market basket analysis.

6.State the machine learning model that would be best to make a robot walk through various

unfamiliar terrains?

Ans: Reinforcement Learning models, particularly Deep Q-Networks (DQN) or Proximal Policy Optimization (PPO), are often used to train robots to navigate unfamiliar terrains. These models learn through trial and error by receiving feedback on their actions in an environment.

7.Which algorithm will you use to divide your customers into different groups?

Ans: A popular choice for customer segmentation would be the k-means clustering algorithm. It groups customers based on similarities in their behavior or attributes, allowing companies to tailor their strategies for each segment more effectively.