Week 1 Assignment

Q1. What is Machine Learning ?

Ans. Machine learning is a process where a model is trained to understand data, Understand the patterns or relationships within that data, and use those patterns to make predictions or decisions on new or unseen data.

Example :

Let’s say a farmer gives this information:

* Temperature = 30°C
* Rainfall = 200 mm
* Soil Type = Loamy

Suppose the machine learning model has already learned from past data that:

"If the temperature is high, rainfall is good, and soil is loamy, then Rice grows well."

Therefore, the model will recommend Rice to the farmer.

Q2. What is supervised machine learning ?

Ans. Supervised Machine Learning is a type of machine learning algorithm where the model is trained using labeled data, meaning the input data is already mapped to the correct output and the output is known. The model learns this mapping during training so that it can predict the output for new, unseen inputs.

Since the output is known in the training data, the model is called Supervised.

Q3. What is regression and classification ?

Ans. **Classification** :

Classification is a type of supervised machine learning technique where the model is used to predict categorical labels means the output belongs to one of the fixed categories or classes.

Example :

Suppose you give the model this input:

* Temperature: 28°C
* Rainfall: 180 mm
* Soil Type: Sandy

The model has been trained on labeled data where different combinations of weather and soil conditions are mapped to crop types like Wheat, Rice, or Sugarcane.

Since the output is a fixed category (crop name), So this is a classification problem.

The model will classify the input into one of the fixed classes, e.g "Wheat".

**Regression :**

Regression is a type of supervised machine learning technique where the model is used to predict continuous numerical values, meaning the output can be any number within a range rather than fixed categories.

Example :

The input given to the model is:

* Temperature: 30°C
* Rainfall: 200 mm
* Soil Type: Loamy
* Fertilizer Used: 20 kg

The model is trained on past data where these features are mapped to actual crop yields (in kg/hectare).

The model predicts something like: “You will get 3200 kg of yield.”  
  
In summary, classification predicts categories, while regression predicts numerical values.