**WEEK: 1**

1. **WHAT IS MACHINE LEARNING?**

**Ans.** Machine Learning (ML) is a branch of artificial intelligence (AI) that enables computers to learn from data and make decisions or predictions without being explicitly programmed. Instead of following fixed rules, ML algorithms identify patterns in data and improve their performance over time with experience.

For example, in agriculture, ML can help predict the best crop to grow based on soil and climate data.

1. **WHAT IS SUPERVISED MACHINE LEARNING ALGORITHM?**

**Ans.** Supervised Machine Learning is a type of machine learning where the model is trained on a labelled dataset — meaning the input data is paired with the correct output. The algorithm learns the relationship between inputs and outputs so it can predict outcomes for new, unseen data.

For example, in a crop recommendation system, a supervised ML model can be trained on data like soil type, pH, temperature, and crop labels. Once trained, it can predict the best crop for a new set of conditions.

Common supervised algorithms include:

* Linear Regression
* Decision Trees
* Random Forest
* Support Vector Machines (SVM)
* K-Nearest Neighbours (KNN)

1. **WHAT IS REGRESSION AND CLASSIFICATION?**

**Ans.** Regression and Classification are two main types of problems in supervised machine learning:

🔹 Regression:

* Purpose: Predicts a continuous numeric value.
* Example: Predicting crop yield (in kg) based on soil and weather conditions.
* Algorithms Used: Linear Regression, Decision Tree Regression, etc.

🔹 Classification:

* Purpose: Predicts a class or category label.
* Example: Predicting which crop (e.g., rice, wheat, maize) to grow based on soil and climate data.
* Algorithms Used: Logistic Regression, Random Forest, SVM, KNN, etc.