1. **What is ML?**

ML stands for Machine Learning. It is a subfield of artificial intelligence (AI) that focuses on creating systems that can learn from and make decisions based on data, without being explicitly programmed for every specific task.

In simple terms:

Machine Learning is about teaching computers to learn from experience (data) and improve over time.

Example:

* A machine learning model can be trained on thousands of pictures of cats and dogs. Once trained, it can identify whether a new image is a cat or a dog — even though it hasn’t seen that specific image before.

Types of Machine Learning:

1. Supervised Learning – The model is trained on labeled data (e.g., spam vs. not spam).
2. Unsupervised Learning – The model finds patterns in data without labels (e.g., customer segmentation).
3. Reinforcement Learning – The model learns by trial and error, receiving rewards or penalties (e.g., game playing agents).
   1. **What is supervised ML algorithm?**

A supervised machine learning algorithm is a type of ML algorithm that learns from labeled training data, where each training example consists of an input and the corresponding correct output. The goal of the algorithm is to learn a mapping from inputs to outputs so that it can predict the output for new, unseen inputs.

Characteristics:

* Requires labeled data (i.e., input-output pairs).
* The learning process is guided by the correct answers (supervision).
* Used for both classification (predicting categories) and regression (predicting continuous values).

Examples of Supervised Learning Algorithms:

* Linear Regression
* Logistic Regression
* Decision Trees
* Random Forest
* Support Vector Machines (SVM)
* k-Nearest Neighbors (k-NN)

Applications:

* Email spam detection
* House price prediction
* Disease diagnosis
* Sentiment analysis
* Credit risk assessment

1. **What is regression and classification?**

In machine learning, regression and classification are two types of supervised learning tasks, depending on the nature of the output (target) variable.

1. Regression:

Definition:  
Regression is used when the output (target) variable is continuous and numerical. The goal is to predict a real-valued number based on input data.

Example Use Cases:

* Predicting house prices based on size and location
* Forecasting stock prices
* Estimating temperature or rainfall

Common Algorithms:

* Linear Regression
* Decision Tree Regression
* Random Forest Regression

2. Classification:

Definition:  
Classification is used when the output (target) variable is categorical. The goal is to assign input data to one or more predefined categories or classes.

Example Use Cases:

* Email spam detection (Spam or Not Spam)
* Disease diagnosis (Positive or Negative)
* Image recognition (Cat, Dog, or Horse)

Common Algorithms:

* Logistic Regression
* Decision Trees
* Support Vector Machines (SVM)
* k-Nearest Neighbors (k-NN)
* Naive Bayes