Introduction to Machine Learning

What is Machine Learning?

It’s a way to teach computers to **learn from data** instead of being programmed with fixed rules.

Why is it important?

•Helps apps recommend movies, songs, or products.

•Powers self-driving cars.

•Assists doctors in finding diseases faster.

Main Types:

- ❑ Supervised Learning
- ❑ Unsupervised Learning
- ❑ Reinforcement Learning

Supervised Learning

Definition:

The model learns from **labeled data** (Inputs + Outputs).

Idea:

Train on known data to predict outcomes for new data.

Examples:

1.Classification: Email filtering (Spam vs. Not Spam).

2.Regression: Predicting house prices based on size & location.

Unsupervised Learning

Definition:

The model learns from **unlabeled data** (only Inputs).

Idea:

Discover hidden patterns or group data into clusters.

Examples:

1.Clustering: Customer segmentation in marketing.

2.Dimensionality Reduction: Simplifying image data in Computer Vision.

Reinforcement Learning

Definition:

The model learns through **trial and error** by interacting with an environment.

Idea:

Agent takes an action → receives **reward or penalty** → improves strategy.

Examples:

- Training robots to walk.
- Game-playing algorithms like **AlphaGo** or Chess AI.

Thank you!