

# Introduction to Machine Learning

Machine Learning is a subset of Artificial Intelligence that enables systems to learn patterns from data and make decisions without being explicitly programmed.

There are three main types of Machine Learning: Supervised Learning, Unsupervised Learning, and Reinforcement Learning.

Supervised Learning uses labeled data to train models for tasks like classification and regression.

Unsupervised Learning works with unlabeled data to discover hidden patterns or groupings.

Reinforcement Learning trains agents to make decisions by rewarding desired behaviors.

Training data is used to teach a model, while testing data is used to evaluate its performance.

Common algorithms include Linear Regression, Decision Trees, Support Vector Machines, and Neural Networks.

Model evaluation metrics include Accuracy, Precision, Recall, and F1-Score.

## Key Concepts:

- Data is the foundation of Machine Learning.
- Features are measurable properties of the data.
- A model learns patterns during training.
- Overfitting occurs when a model memorizes instead of generalizing.
- Evaluation ensures the model performs well on unseen data.