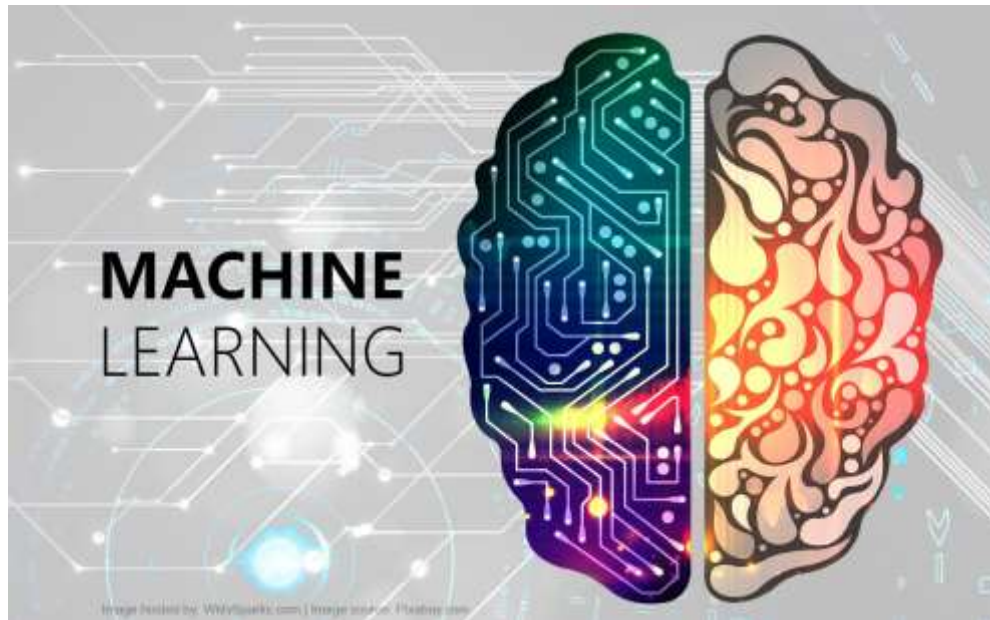


## Department of Artificial Intelligence and Machine Learning



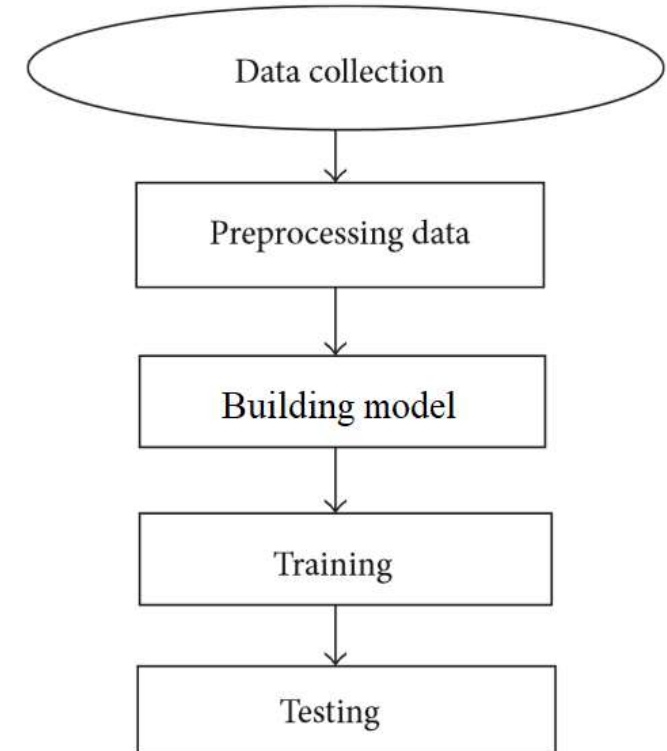
23AMB201 –Machine Learning  
II B.Tech. AIML - B/ III SEMESTER

UNIT I : Introduction

Topic :Introduction to Machine Learning

# Recall – Introduction to Machine Learning

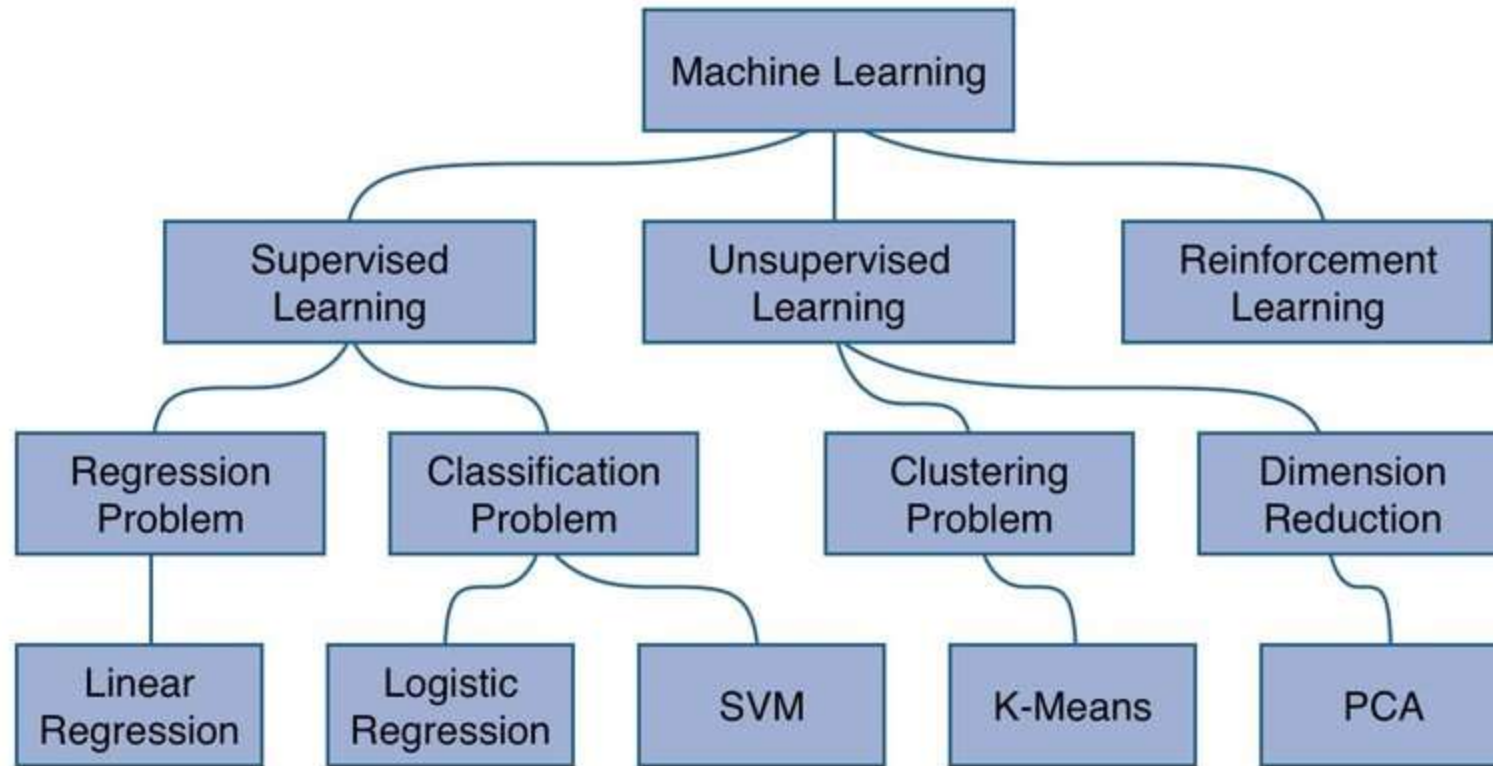
- Machine Learning allows systems to learn from data
- Improves performance with experience
- Data + Algorithm → Model → Prediction



# Learning Objectives

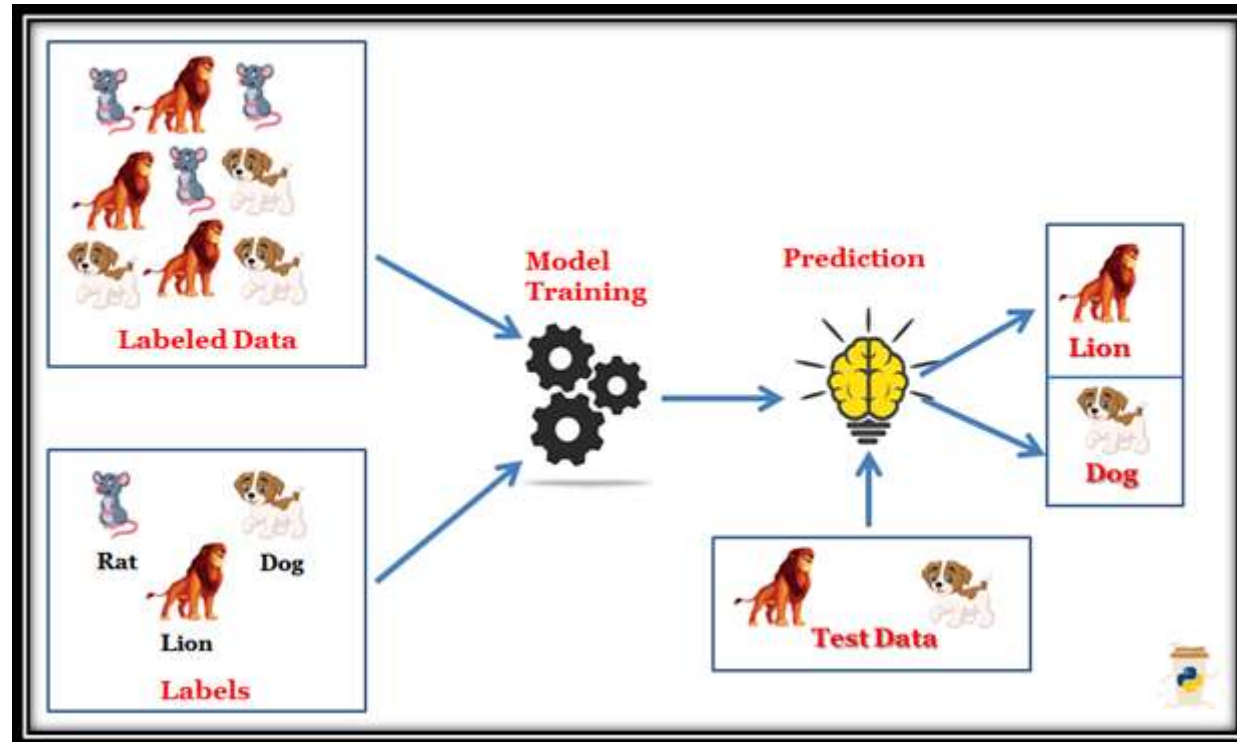
- Understand different types of Machine Learning
- Identify characteristics of each type
- Relate ML types with applications

# Classification of Machine Learning



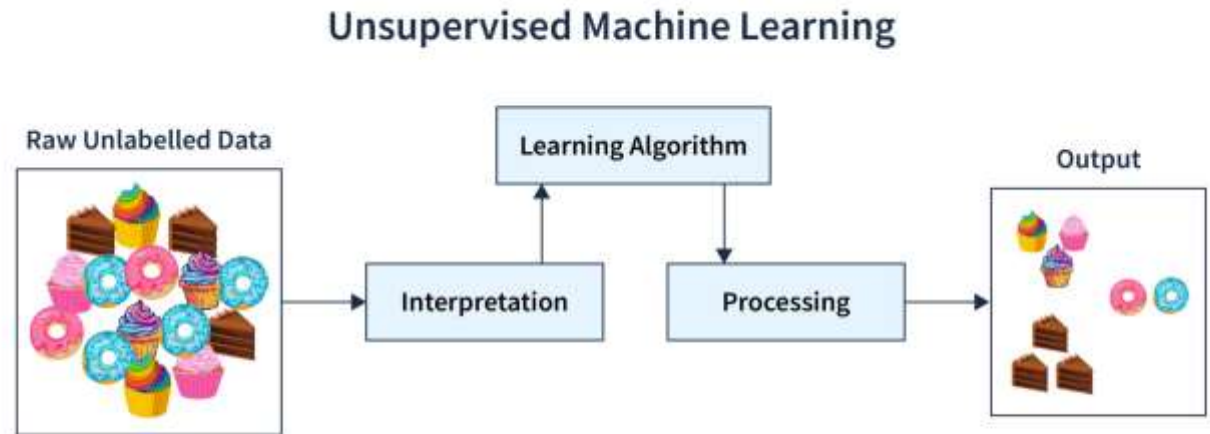
# Supervised Learning

- Uses labeled data
- Classification and Regression tasks



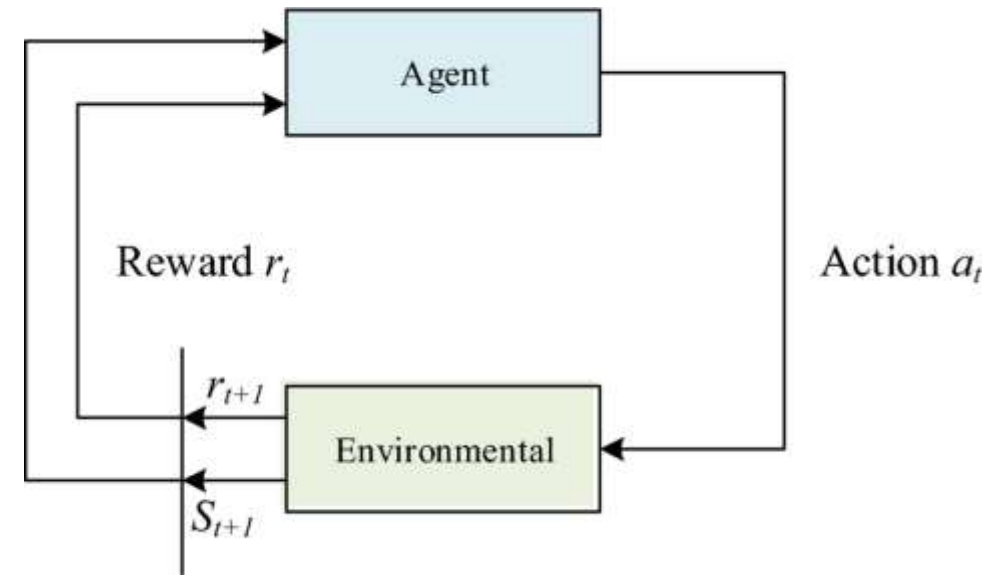
# Unsupervised Learning

- Uses unlabeled data
- Clustering and association



# Reinforcement Learning

- Learns using rewards and penalties
- Agent interacts with environment



# Comparison of ML Types

Differ by	Supervised Learning	Unsupervised Learning	Reinforcement learning
Definition	The machine learns patterns by using labeled data	The machine is trained by Unlabeled data	No training dataset, so bound to learn from its experience
Data	Labeled	Unlabeled	No predefine data
Dataset	Use training dataset	Use just input dataset	Not predefine
Uses of	Prediction	Analysis	Consequence or behavior
Divided into	Classification and regression	Clustering, density estimation and dimensionality reduction	Reward-based
Approach	Maps the labeled input to the known output	Understand patterns and discovered output	Follows the trial and error methods
Models/networks	CNN, RNN, RvNN	DBN, DBM, GAN, VAE	Markov Decision process learning
Helpful in areas	Image Recognition, speech recognition, forecasting	Pre-process the data, pre-train supervised learning algorithms	Warehouses, Inventory management, aircraft control, robot motion control, chess game

# Applications

- Supervised:
  - Spam detection
  - prediction
- Unsupervised:
  - Customer segmentation
- Reinforcement:
  - Robotics,
  - games

# Advantages and Limitations

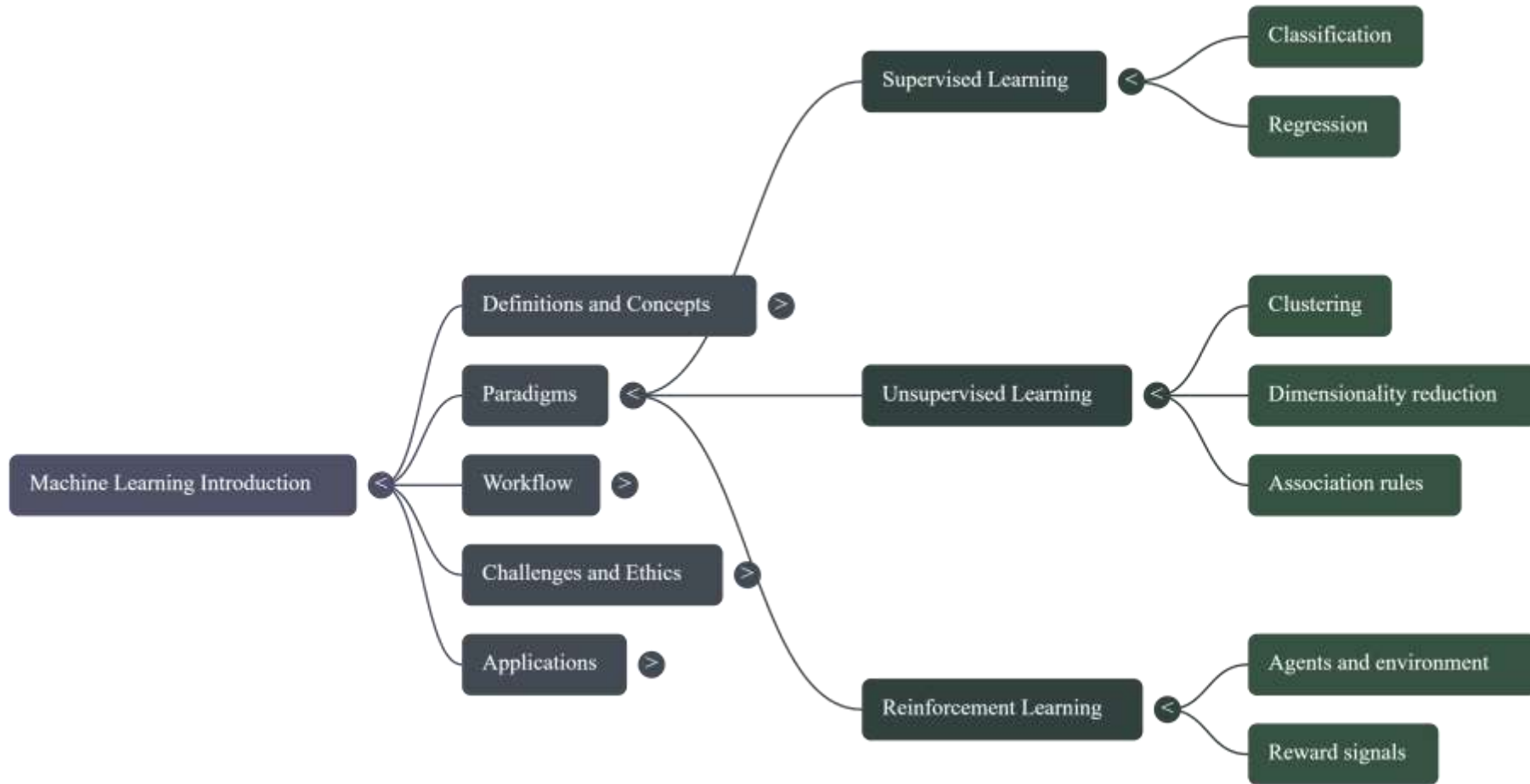
## Advantages:

- Automation
- Accuracy

## Limitations:

- Data dependency
- Computation cost

# Mind Map



# Assessment

1. What are the types of Machine Learning?
2. Differentiate supervised and unsupervised learning.
3. Explain reinforcement learning.

# References

- GeeksforGeeks – Types of Machine Learning
- Scikit-learn Documentation
- NPTEL – Machine Learning