MACHINE LEARNING INTRODUCTION:

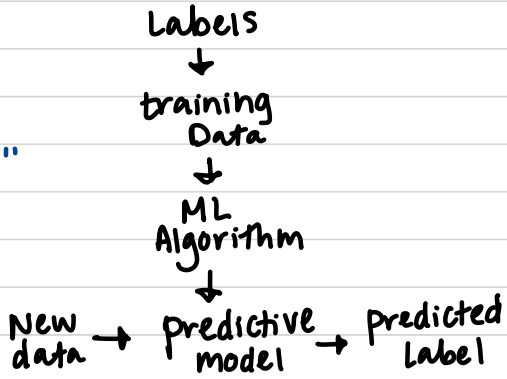
- Machine Learning pertains to the application & science of algorithms that make sense of data. It involves self-learning algorithms that derive knowledge from data to make predictions. ML is a subfield of Artificial Intelligence.

- 3 different types:

Supervised Learning	Unsupervised learning	Reinforcement Learning
> Labeled data	> NO labels / targets	> Decision process
> Direct feedback	> NO feedback	> Reward System
> predict outcome/future	> find structures in data	> learn series of actions

- SUPERVISED LEARNING: main goal is to train a model on labeled data that enables to make predictions about unforseen data.

general structure:



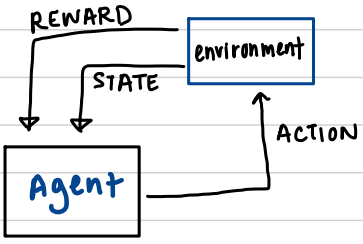
"Label Learning"

Types:

CLASSIFICATION
predict categorical Data

REGRESSION
predict continuous outcomes

- REINFORCEMENT LEARNING: Develop a system (Agent) that improves its performance based on interactions w/ the environment



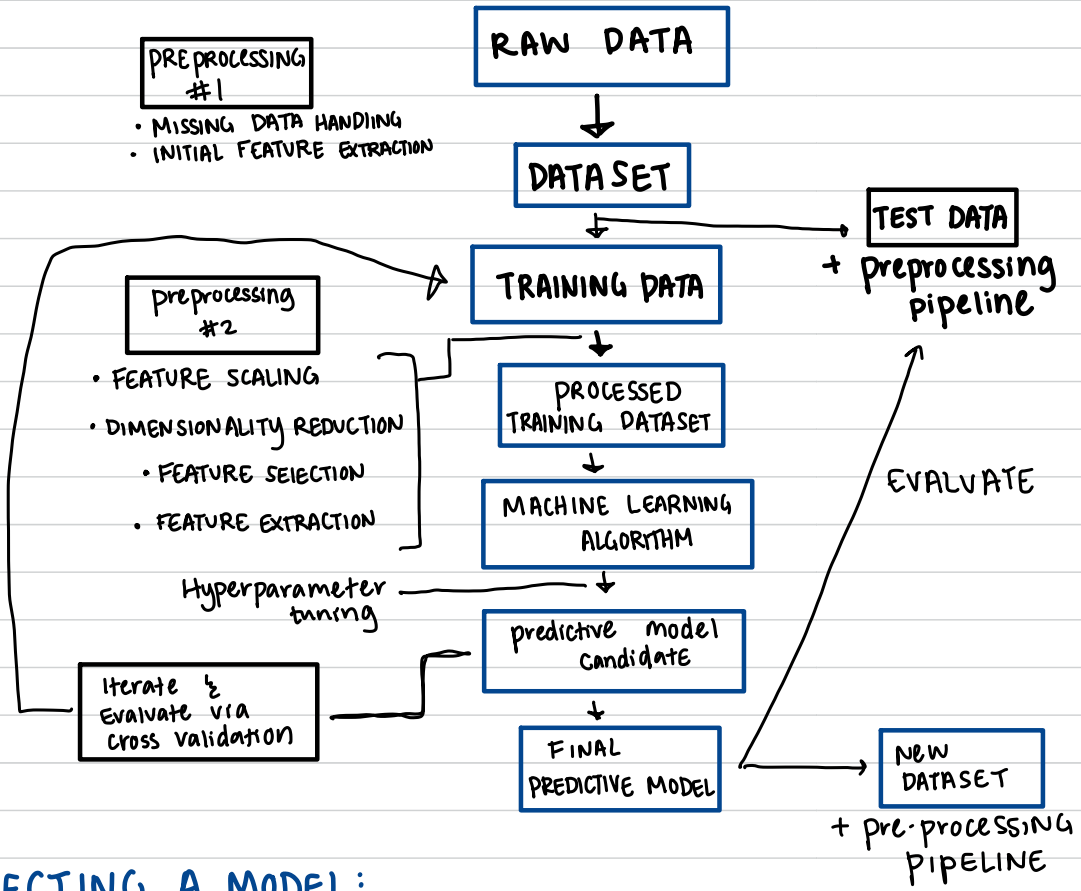
MACHINE LEARNING INTRODUCTION:

- **UNSUPERVISED LEARNING:** exploration of the Data structure to extract meaningful information without the guidance of a known outcome variable or reward function.

  - unsupervised classification: organization of information into meaningful subgroups without having prior knowledge of group membership.

  - DIMENSIONALITY REDUCTION: form of unsupervised learning that identifies & removes noise features. Compression of the data improves computational load while retaining relevant information.

ROADMAP for building machine learning systems:



SELECTING A MODEL:

- NO ONE MODEL IS BEST SUITED TO FIT ALL TASKS!
- It is imparative to test a handful of models to determine which best suits the task at hand.