Machine Learning Algorithms

Sayemuzzaman
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**Machine learning algorithms can be categorized into three main types:**

Three types of Machine Learning Algorithms

Supervised Learning:

In supervised learning, the algorithm learns from a labeled dataset, where the input data (features) is paired with the correct output (labels). The goal is to learn a mapping from inputs to outputs, making it suitable for tasks like classification and regression.
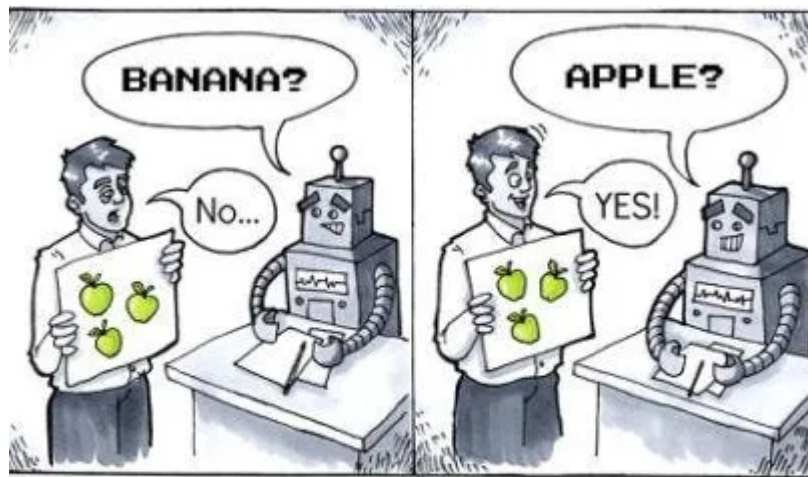
Machine learning from a labeled data.

Supervised Learning Real-Life Example:

Imagine you're teaching your child (Sam) about Fire🔥 and Rain☁. You show him pictures of 🔥 and ☁ and tell him, "This is Fire🔥, and this is Rain☁." Over time, Sam learns that the picture of 🔥 is called Fire, and ☁ is called Rain. This learning process, where Sam learns from labeled examples is called **Supervised Learning**.

Unsupervised Learning:

Unsupervised learning involves working with unlabeled data, where the algorithm tries to find patterns or structures within the data and group them together. Common tasks include clustering and dimensionality reduction.
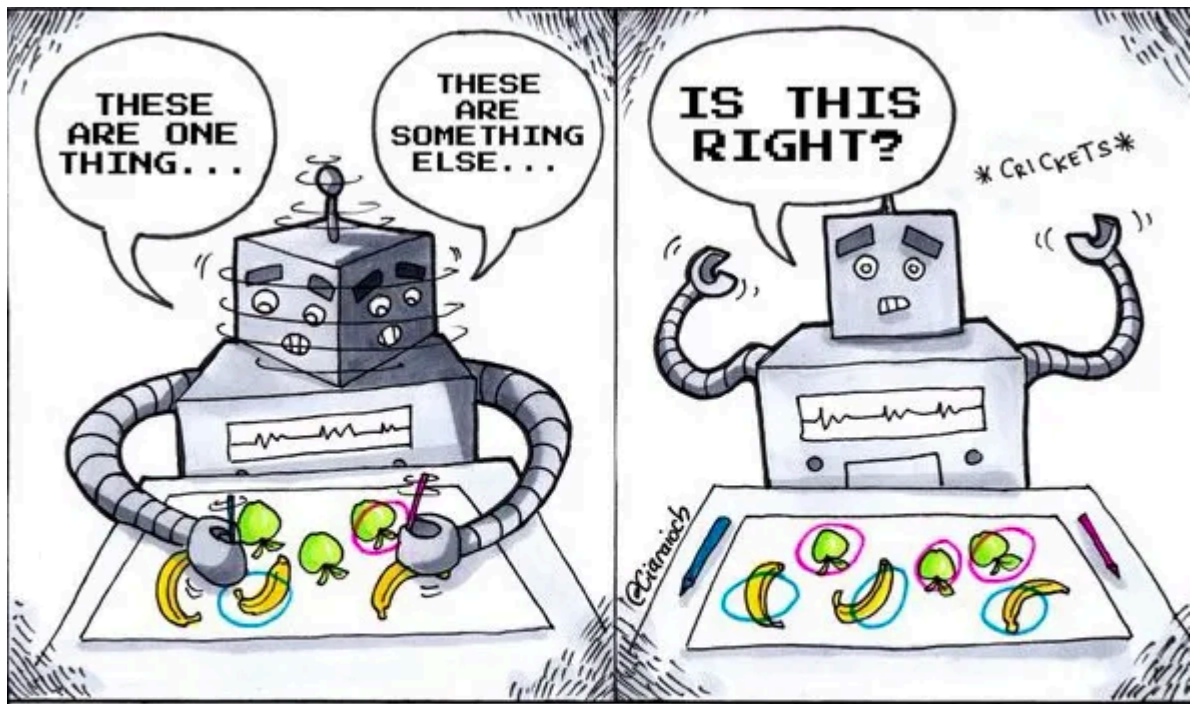
Machine categorized the fruits into two categories based on their shape
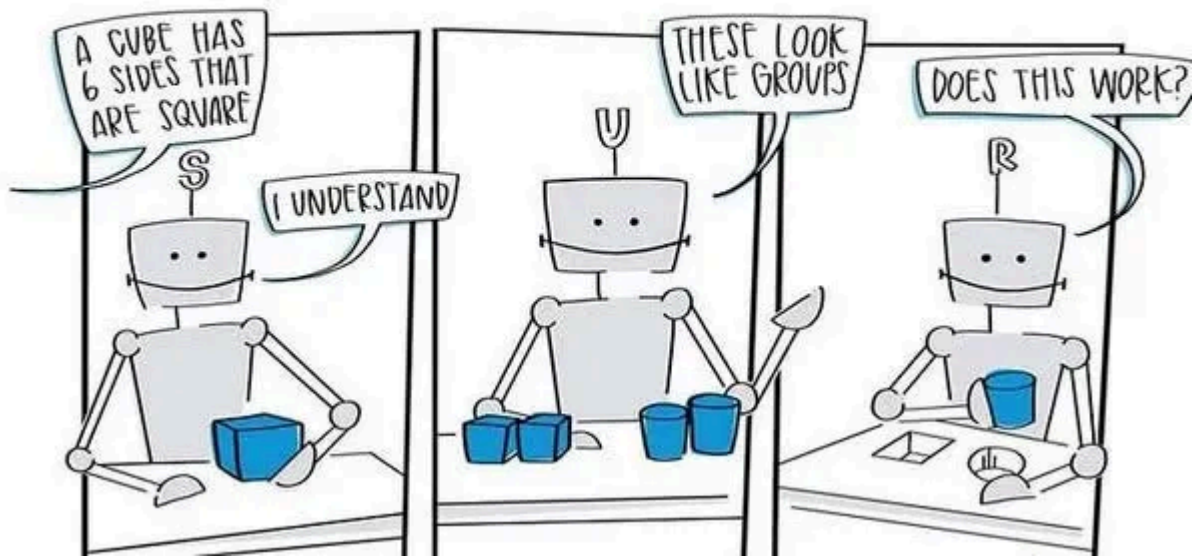
Unsupervised Learning Real-Life Example:

Here, you don't tell Sam what Fire🔥 and Rain☁️are. Instead, Sam observes the two items and notices that they look different. He decides to group them into two categories without anyone telling him which is which.

This type of learning, where Sam organizes the data into groups on his own, is **Unsupervised Learning**.

Reinforcement Learning:

In reinforcement learning, an agent learns to make decisions by interacting with an environment. It receives rewards or penalties based on its actions and aims to maximize cumulative rewards over time. This type of learning is often used in robotics, game-playing AI, and autonomous systems.

MACHINE LEARNING

Supervised, Unsupervised then the third one is Reinforcement Learning

Reinforcement Learning Real-Life Example:

Reinforcement Learning(RL) is bit different than the Supervised and Unsupervised Learning. It's works on Punishment and Reward system.

Imagine Sam is playing a game where his goal is to avoid getting wet in the rain🌧️.

The first time Sam goes outside without an umbrella, he gets wet (punishment)😢.

The next time, Sam decides to take an umbrella🌂. He stays dry and gets a (reward) 😊.

Over time, Sam learns that taking the umbrella leads to a reward, while forgetting it leads to a punishment. As Sam keeps playing the game, he gets better at making the right decision, taking the umbrella to avoid getting wet and earning rewards!

This is **Reinforcement Learning,** where the agent (Sam) learns by interacting with the environment and receiving feedback (rewards or punishments) for his actions.

While there are other specialized types of ML algorithms, these three: Supervised Learning, Unsupervised Learning, and Reinforcement Learning are considered the core categories.
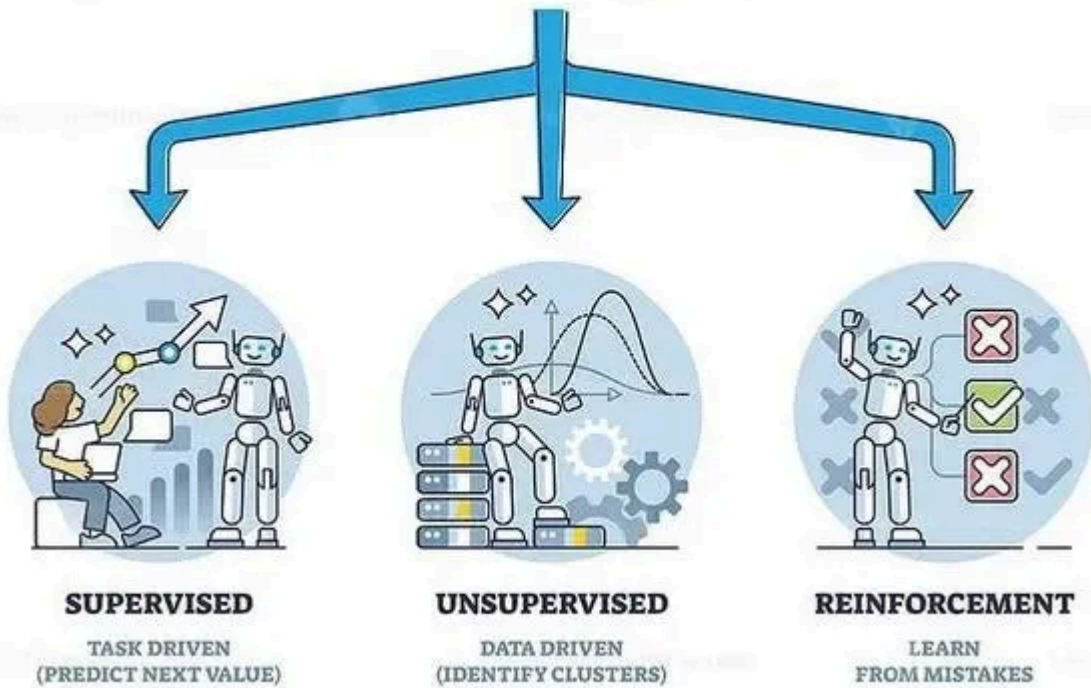
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Supervised Learning

Written by Sayemuzzaman

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