



Introduction to Artificial Intelligence and Machine Learning

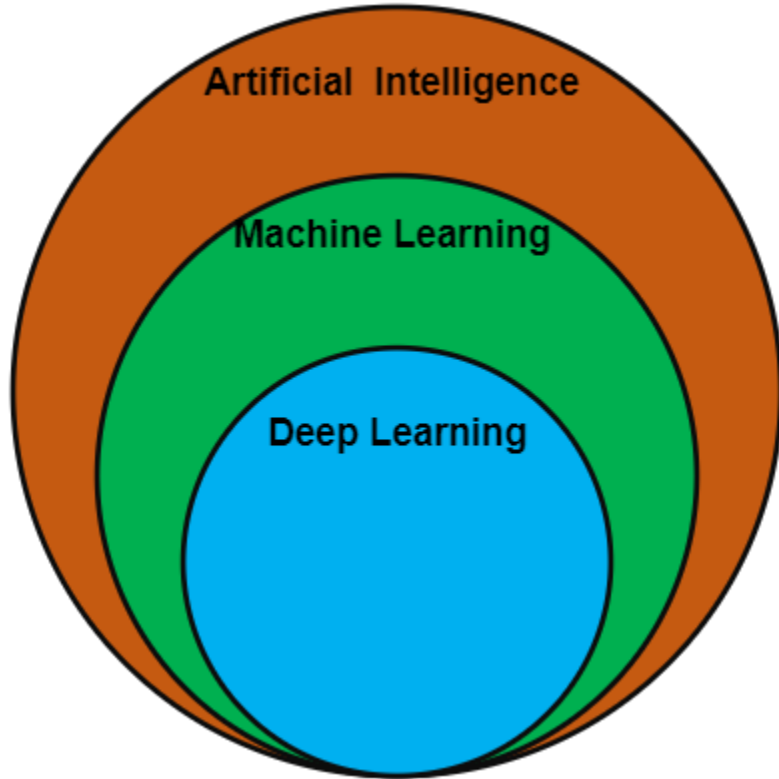
Artificial Intelligence

“Ability to learn, understand and think ” - Oxford Dictionary

Intelligence is also the ability to learn from the environment and change our behaviour based on inputs we receive. The study of how to make computers perform functions which at present humans are good at.

Examples : Voice and Speech Recognition, Face Recognition

Artificial Intelligence



Artificial Intelligence :
Technique which enables machines to mimic the behaviour of human beings.

Machine Learning : Set of algorithms to achieve intelligence

Deep Learning : It is advancement over Machine Learning in which neural network learns from huge amount of data.

Types of AI

- Strong AI
 - Full AI
- General Intelligence
- Narrow AI
 - Weak AI
 - Applied AI

Strong AI

When the machine performs the cognitive functions such as decision making, problem solving where the humans are good at, we call it as Strong AI.

The machine mimics the complete behaviour of human beings

For Ex. Sophia (robot)

Weak AI

Weak AI : Weak AI is generally developed for a specific task.

Many of the existing AI system are the example of Weak AI. It is also referred as narrow AI .

For Ex.

Recommendation Engine (Amazon)

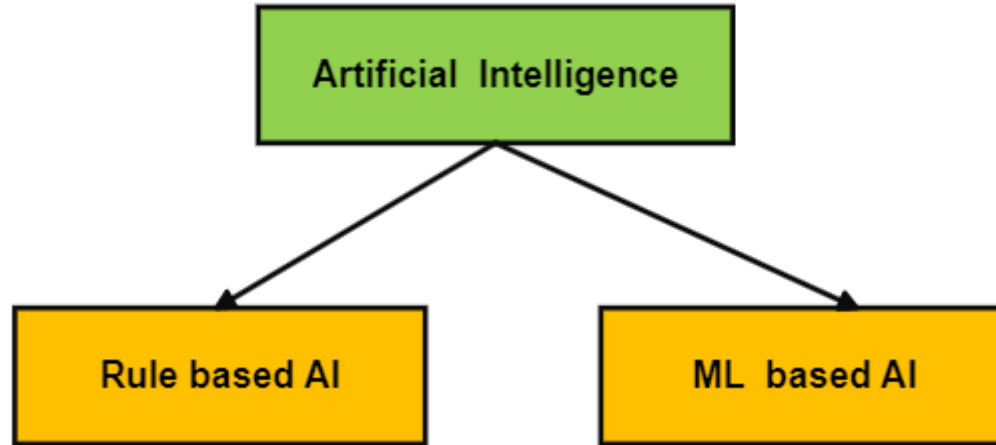
Echo dot and Echo Plus (Amazon)

Search Engines

Chatbots

Digital Voice Assistant (Siri, Alexa)

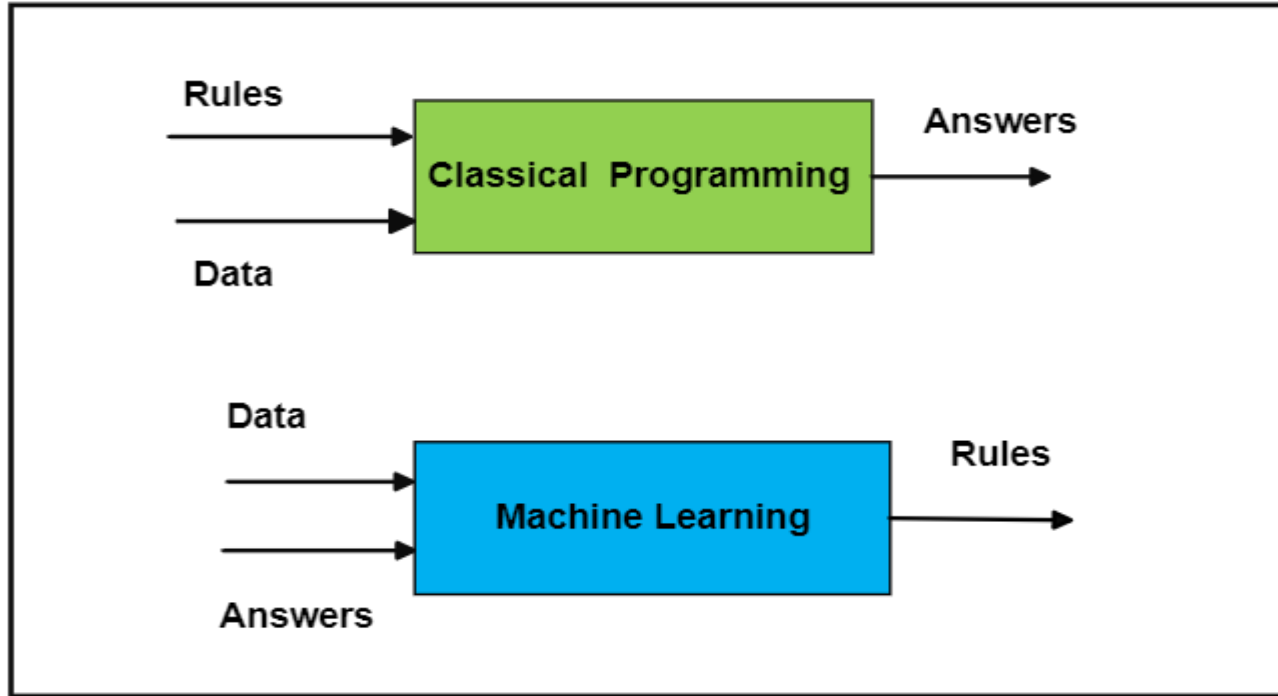
Artificial Intelligence



- Rules are already known
- Rules are generated by humans and given to Machine
- Flawless

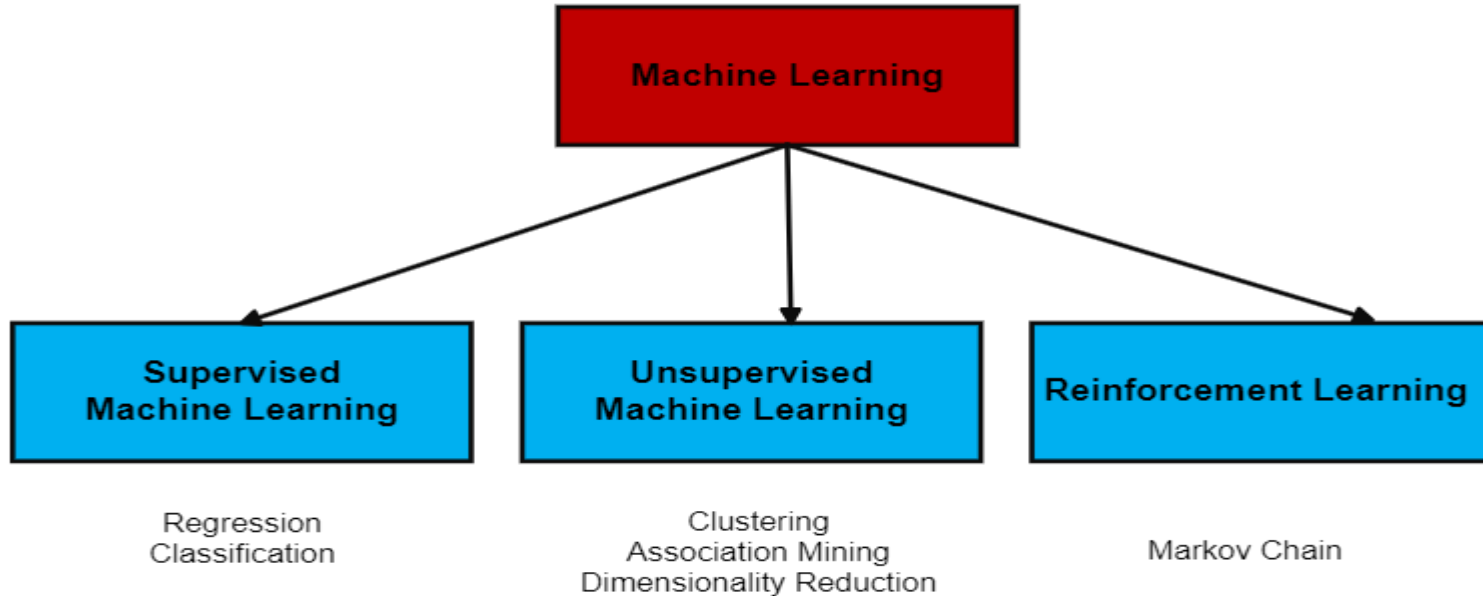
- Rules are not known
- Huge amount of data is given to the machine and it will figure out the rules
- Error Prone

Artificial Intelligence

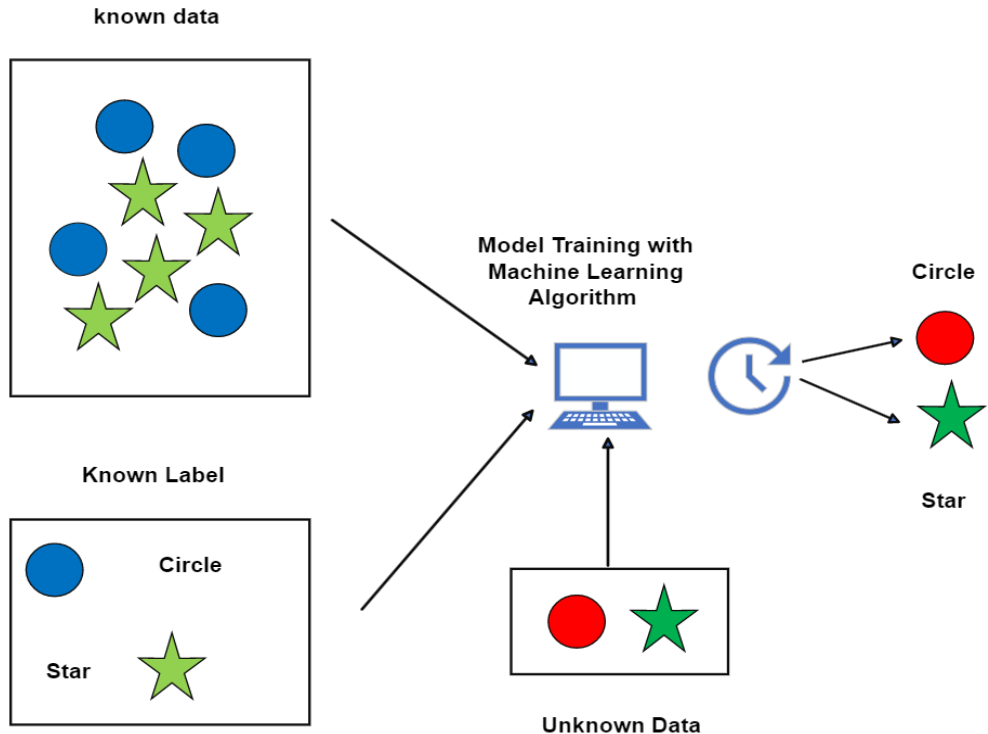


Machine Learning

Machine Learning is science of enabling the machines to learn and behave like human beings by providing historical data without explicitly writing program.



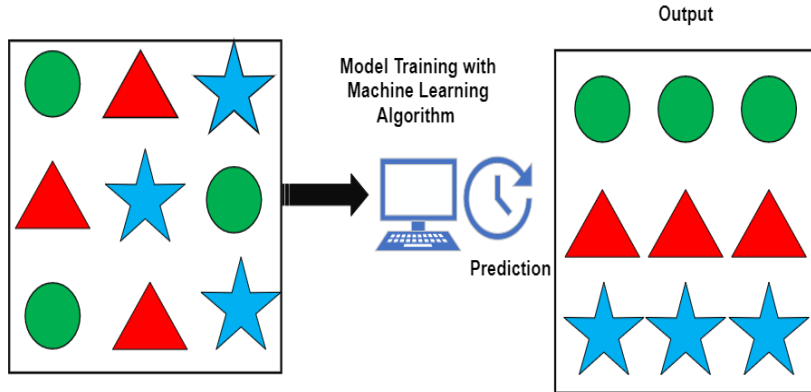
Supervised Machine Learning



In Supervised Machine Learning, machine is able to perform predictions with labelled dataset.

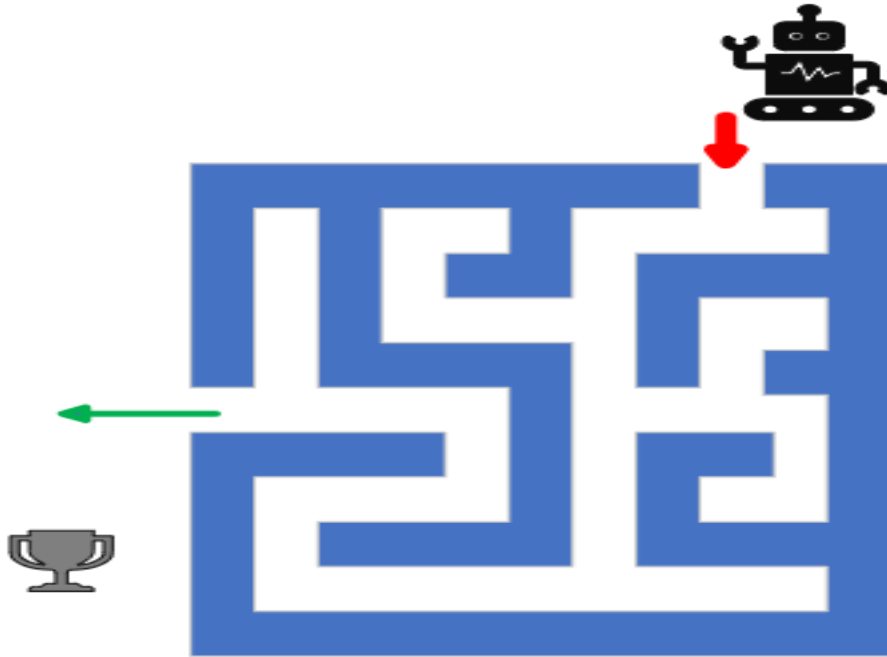
Labelled dataset is the dataset where you know the answer in advance.

Unsupervised Machine Learning



These images of different fruits will be given as input to the model and it will discover the pattern from the data. Machine will categorize the data based on their characteristics.

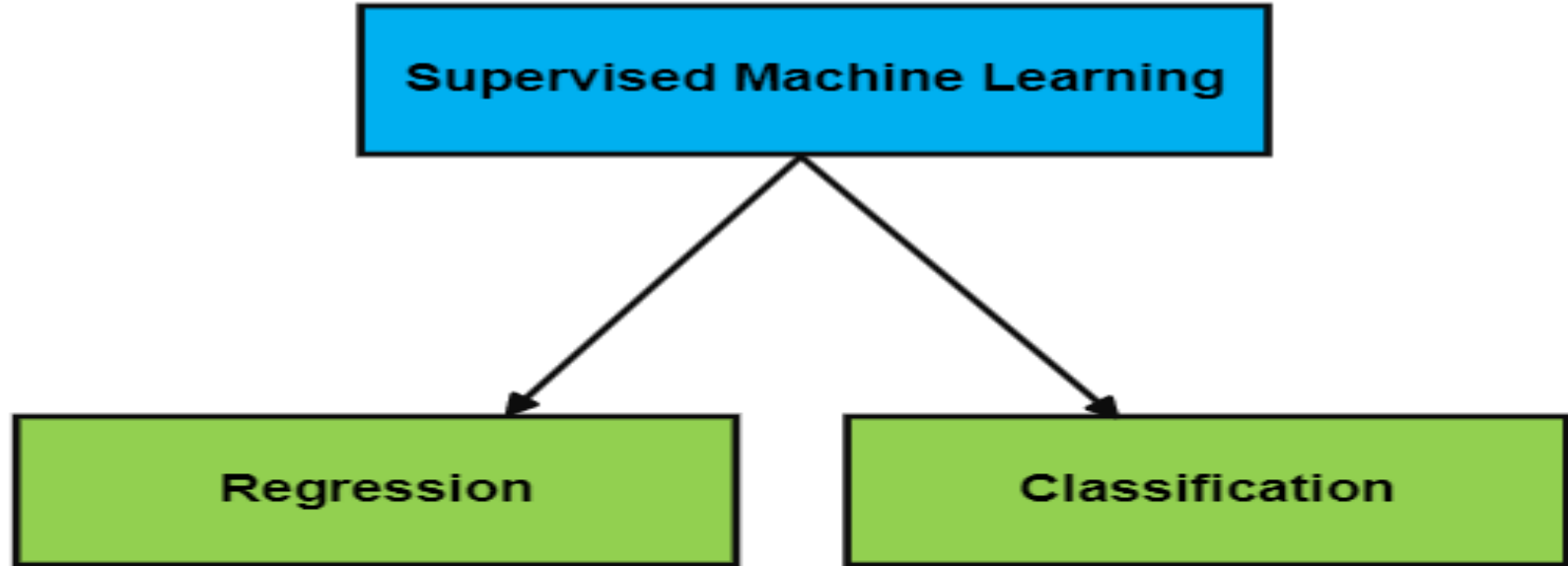
Reinforcement Learning



It is all about investigating optimal behaviour in the environment to achieve maximum reward.

Robot is as an agent and surrounding is an environment. When the robot is moving towards goal, reward is achieved

Types of Supervised Machine Learning



Features :- numerical ,
categorical, ordinal

Label :- numerical
continuous

Features :- numerical ,
categorical, ordinal

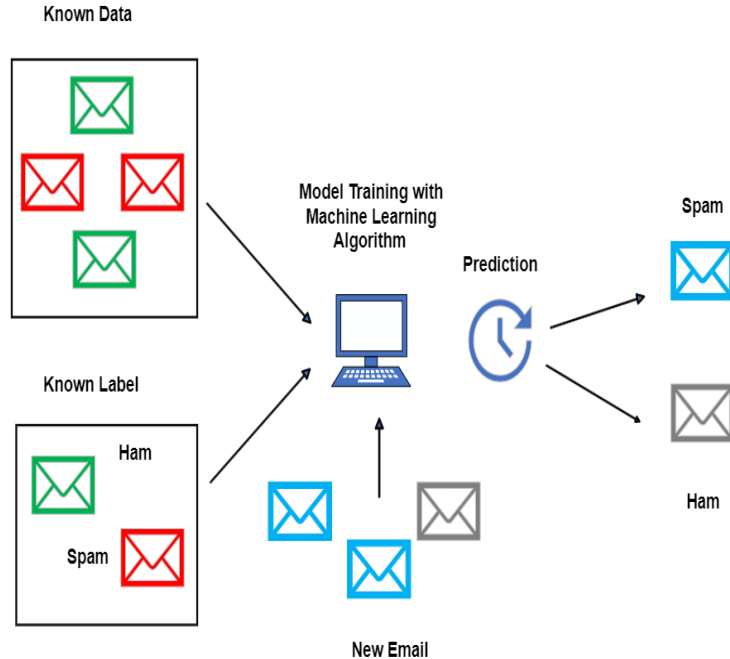
Label :- categorical/
ordinal/ numerical discrete

Classification

Classification is a supervised machine learning technique which categorizes the data into different classes.

It is used when the output/outcome variable is categorical/ordinal/discrete in nature

Classification



To predict the email is spam or not, machine needs to learn what spam email is . This is performed based on spam filters which reviews the content of an email, header of the mail and checking for specific keywords.

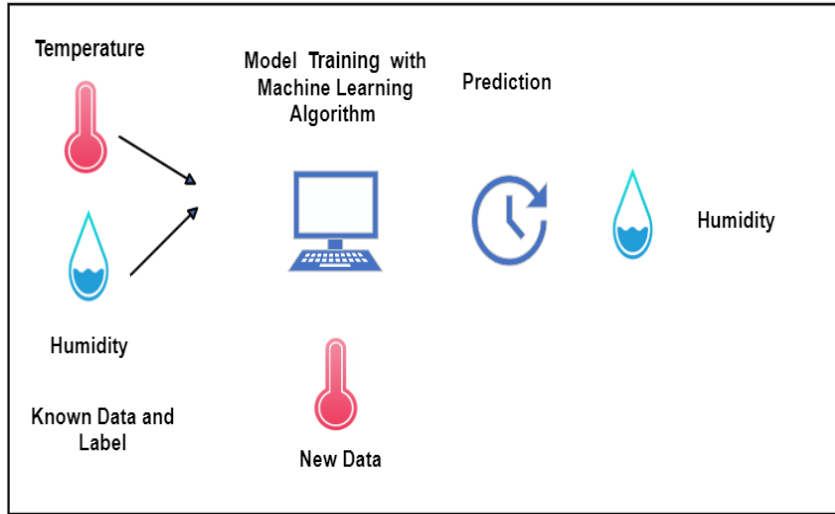
These features are considered to give spam score to an email. Lower score indicates an email is not spam.

Regression

It is supervised machine learning technique used to estimate the relationship between dependent variable and one or more independent variable.

It is used when output/outcome variable is continuous in nature

Regression



Temperature (Independent variable) and humidity (dependent variable) is given as input to the model. The machine is finding out the relationship between two variables.

After training, whenever new data is given to the machine . It easily predicts the humidity.

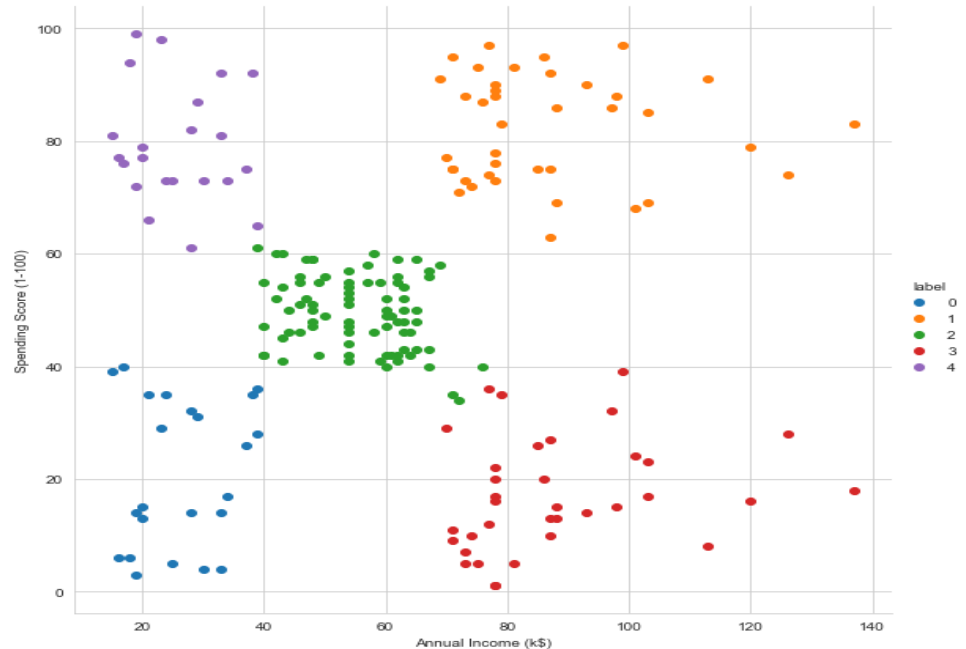
Unsupervised Machine Learning

It is a unsupervised technique where the data is unlabelled. It is used to find the patterns and to discover the relationship between data.

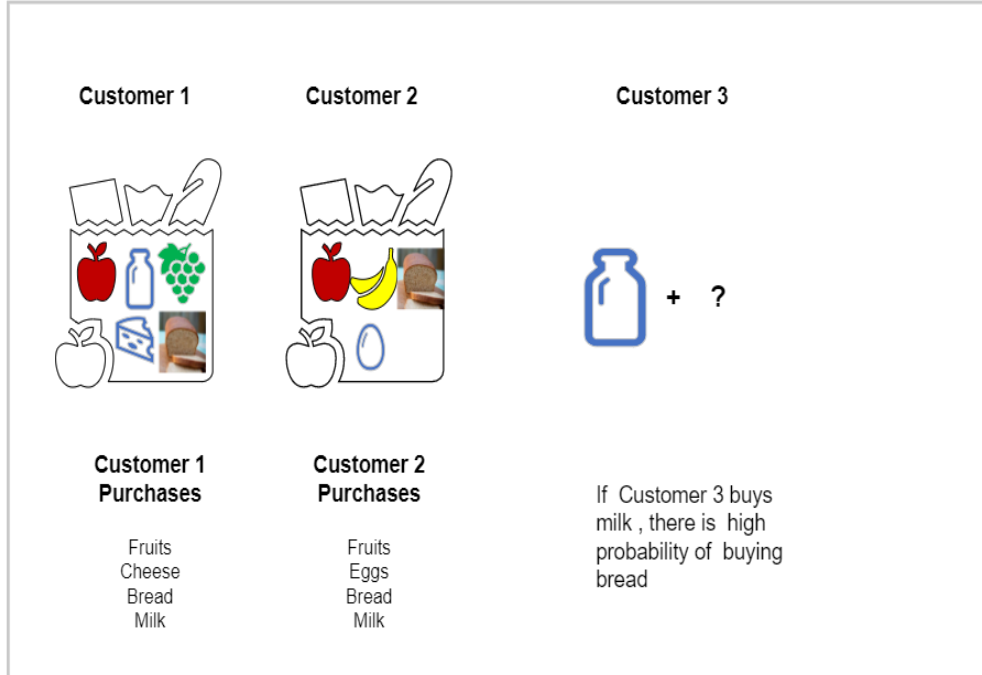
Clustering

CustomerID	Genre	Age	Annual Income (k\$)	Spending Score (1-100)	
0	1	Male	19	15	39
1	2	Male	21	15	81
2	3	Female	20	16	6
3	4	Female	23	16	77
4	5	Female	31	17	40

Clustering : It is grouping of objects with similar characteristics. Customers are grouped based on their characteristics



Association Mining



- It is used to find the relationship between the items.
- It is also used to find frequent Itemset from transaction logs.

Machine Learning Approaches and Application Areas

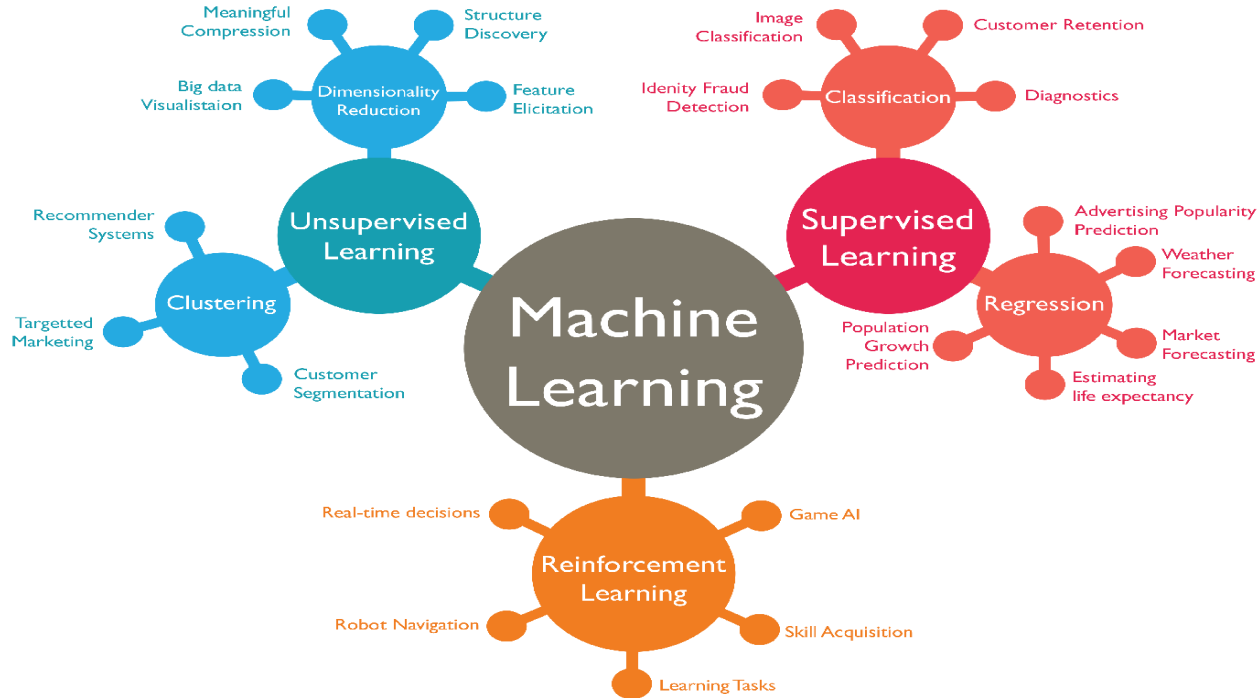


Image Source : <https://wordstream-files-prod.s3.amazonaws.com/s3fs-public/machine-learning.png>



Thank You