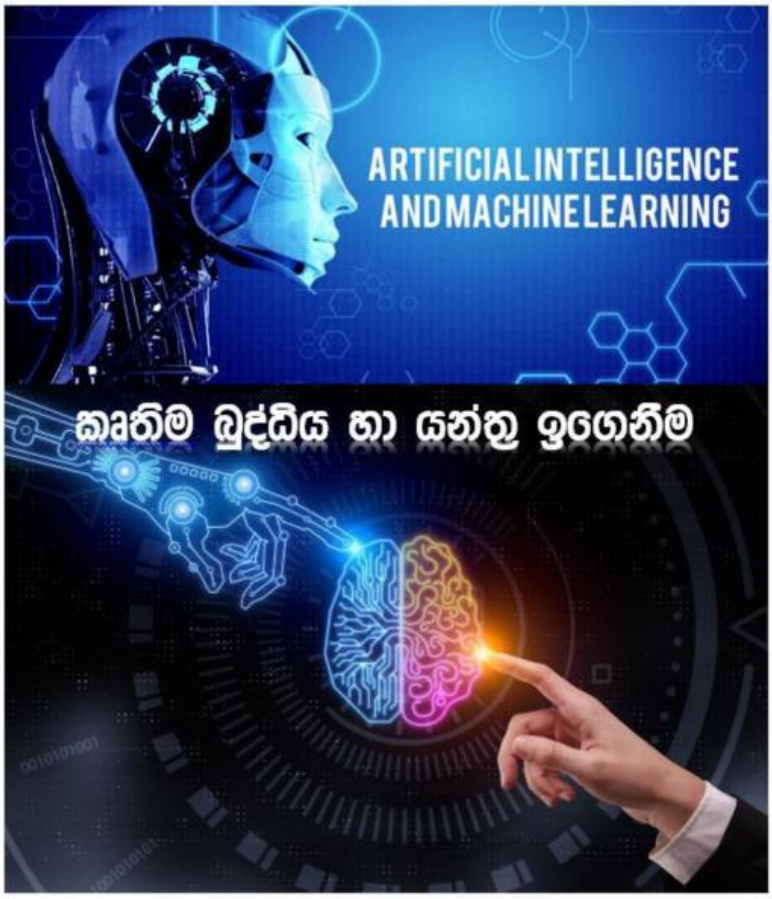
Project 158

DP EDUCATION

Coding School

AI and Machine Learning



- Machine learning is simply teaching a machine from external data and giving that machine the ability to make certain decisions in the future.
- Machine learning has three main parts.
    - Supervised Learning
    - Unsupervised Learning
    - Reinforcement Learning
- Here we consider Supervised Learning.

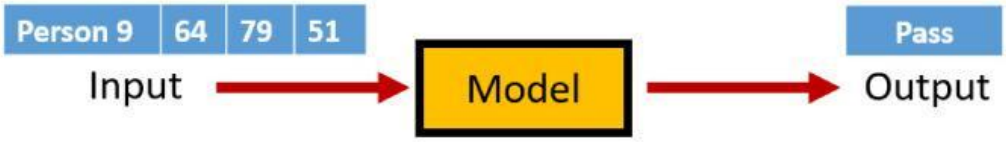
Supervised Learning

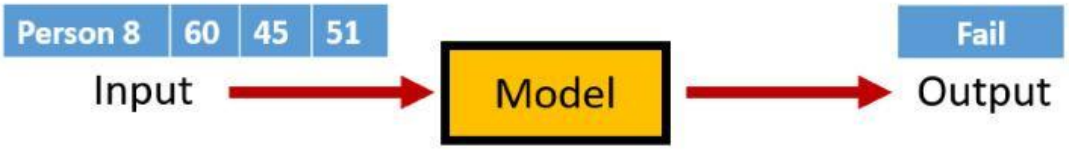
- In supervised learning, the machine is trained from labeled data.
- When you show an image of a cat and mention it as a cat, it is a labeled data
- Let us explain labeled data with the following examples.
- Let's train a machine learning model here to decide whether to pass or fail based on the score of an exam.
- Let us consider the following data set for that.

	Exam 1	Exam 2	Exam 3	Result
Person 1	80	60	65	**Pass**
Person 2	70	54	63	**Pass**
Person 3	61	47	86	**Fail**
Person 4	50	50	83	**Pass**
Person 5	74	31	66	**Fail**
Person 6	58	81	43	**Fail**

- Here, there is a Result column indicating whether the person passed or failed according to the marks obtained in the three exams.

- Here is a labeled data set.
- Here, the data set that we get as input, i.e. the marks obtained in each exam, and according to those marks, there is a result obtained for them. It is the output itself.
- A machine learning modal should be trained from this data first.
- Then the machine can create a pattern according to these data, which marks should pass the exam and which marks should fail the exam.
- The pattern itself is stored by the machine as a machine learning modal.
- After training a machine learning modal in that way, now we can design machine learning modal by giving the scores obtained by people as input and see how the machine predicts whether the person will pass or fail based on those scores.





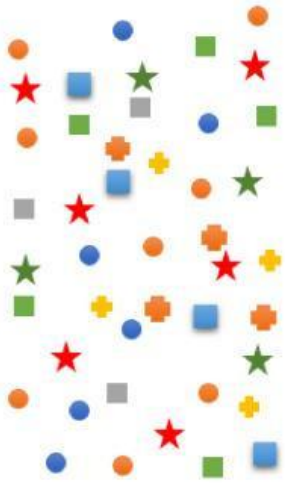
- In some cases, the answer he gives can be wrong.
- In order to increase the accuracy of the result we get, we need to increase the amount of data in the data set used to train the machine learning modal

- Algorithms used in supervised learning are as follows.
    - Linear Regression
    - Logistic Regression
    - Support Vector machine (SVM)
    - K-Nearest Neighbors (KNN)

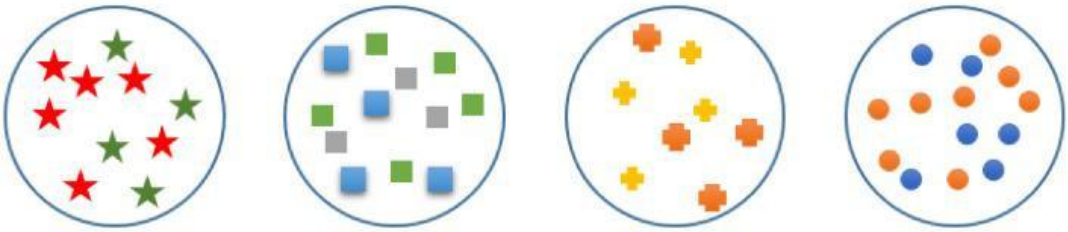
- The important thing to know about supervised learning is that the machine learning modal is trained using labeled data.

Unsupervised Learning

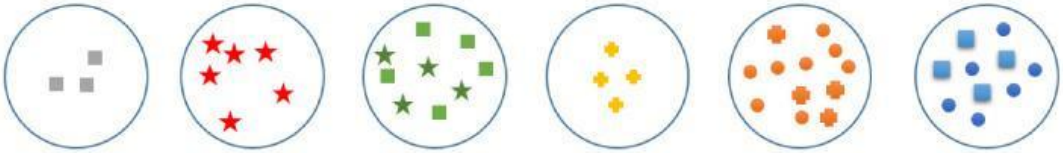
- In unsupervised learning, an unlabeled data set is used for training the machine learning modal.
- Here, although we train the machine learning modal from the data, the output is not presented to the machine.
- Suppose there is a data set as follows.



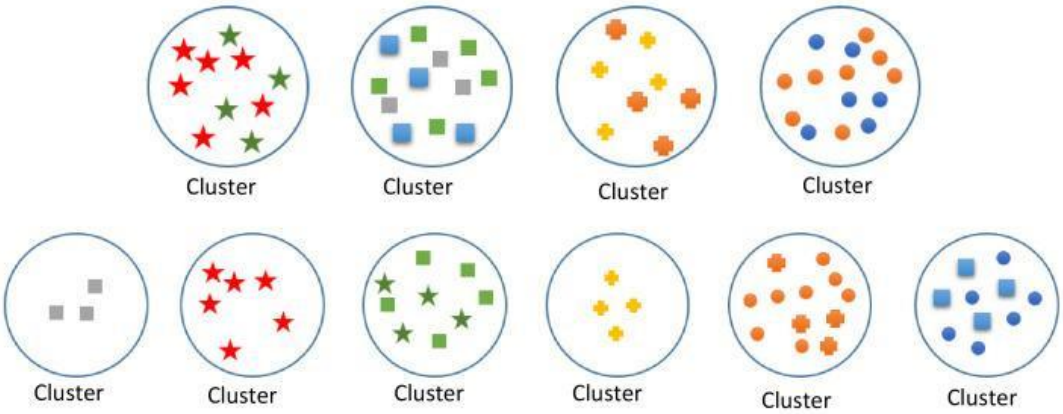
- If we used a data set like the above in supervised learning, then we have to introduce the shapes here. That is, we have to label and identify what is here, what are the circles, what are the stars.
- But in unsupervised learning we do not label this data.
- In unsupervised learning, the machine classifies the data set using the pattern that the machine receives.
- But even if it is classified here, the machine does not know a name for this.
- It is classified according to its shape as follows.



❖ And if the Algorithms can identify the color, the shapes can be separated in the following layers.



❖ In unsupervised learning, separating this data set into individual piles is called clustering.



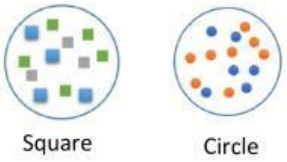
❖ There are several types of clustering that we can use in this way. The Algorithms are as follows.

- K-Means Clustering
- Hierarchical Clustering
- Principal Component Analysis (PCA)
- Singular value Decomposition

Summary

Unsupervised learning

- A labeled data set is used for training the machine learning modal.
- Output



Supervised learning

- An unlabeled data set is used for training the machine learning modal
- Output