SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

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COIMBATORE-641 035, TAMIL NADU

DEPARTMENT OF COMPUTER APPLICATIONS

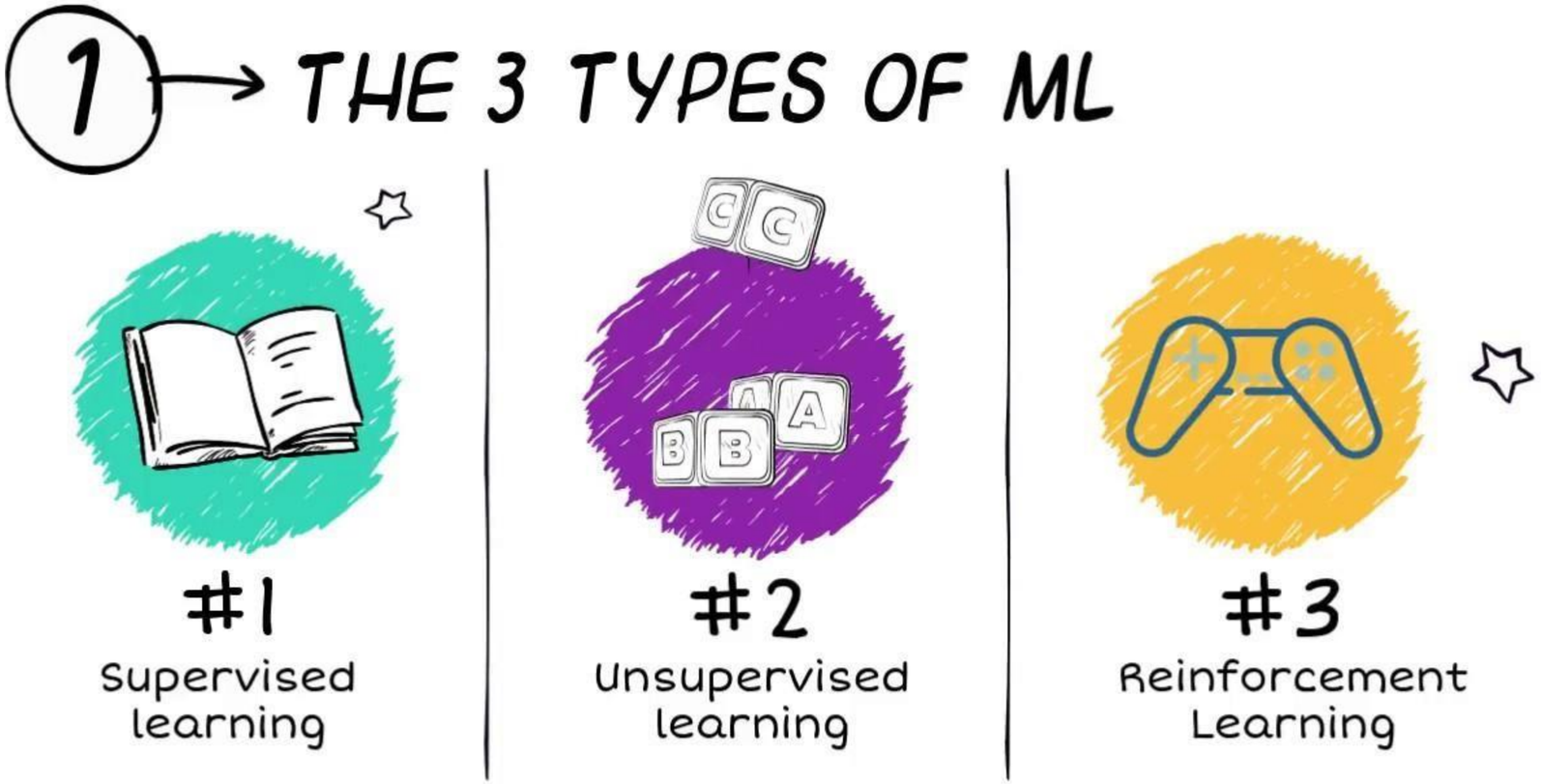
19CAE716 – DATA SCIENCE

UNIT – I: INTRODUCTION TO DATA SCIENCE

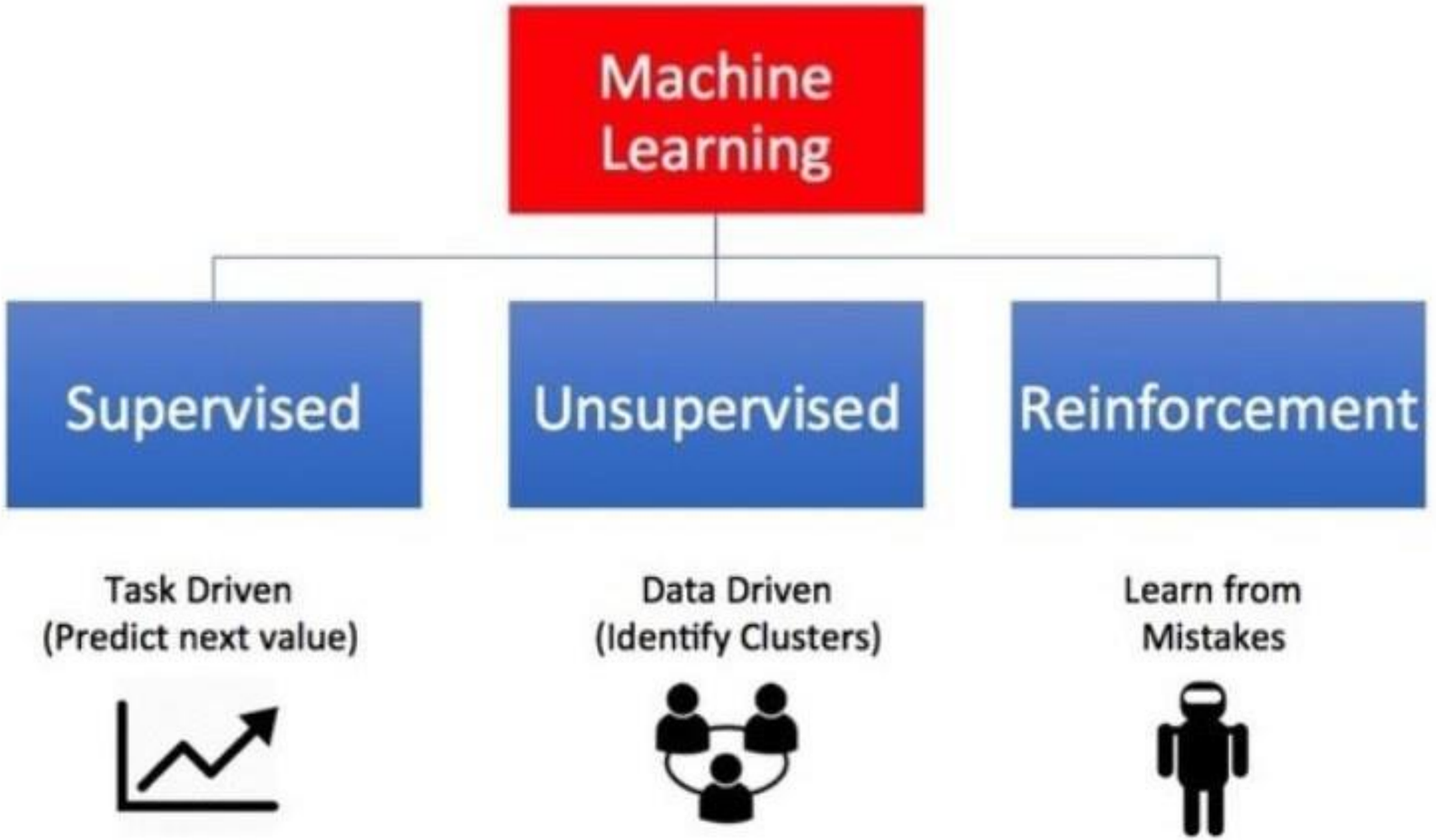
TOPIC: TYPES OF ML

Do you remember this?

Task: 1 minute Talk



Types of Machine Learning



About

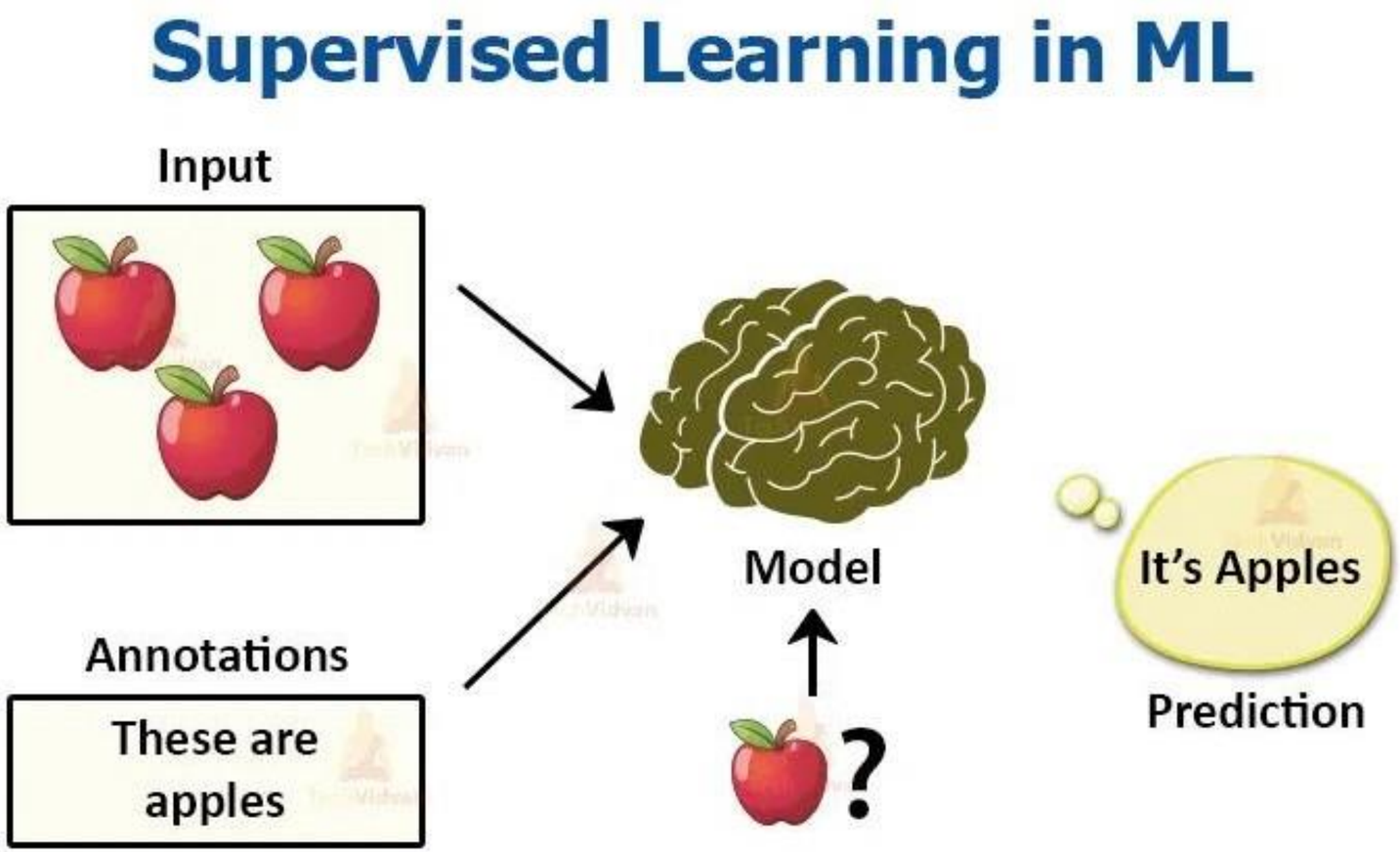
 Supervised (inductive) learning
– Training data includes desired outputs

 Unsupervised learning
– Training data does not include desired outputs

 Semi-supervised learning
– Training data includes a few desired outputs

 Reinforcement learning
– Rewards from sequence of action

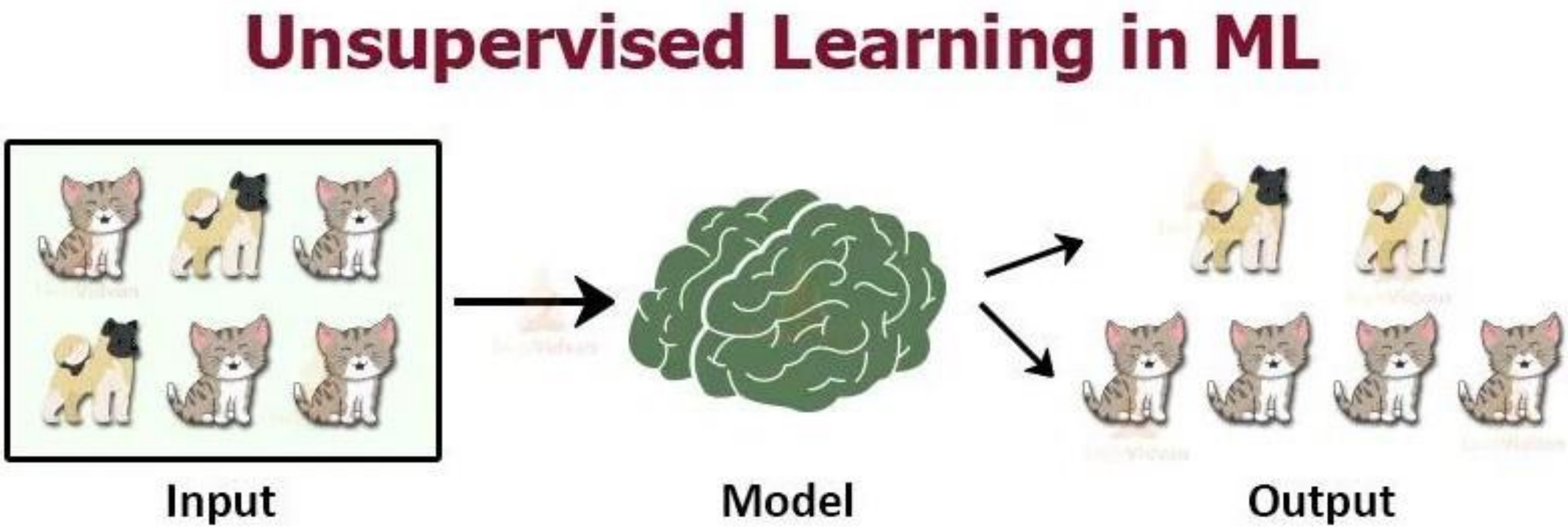
Supervised Learning



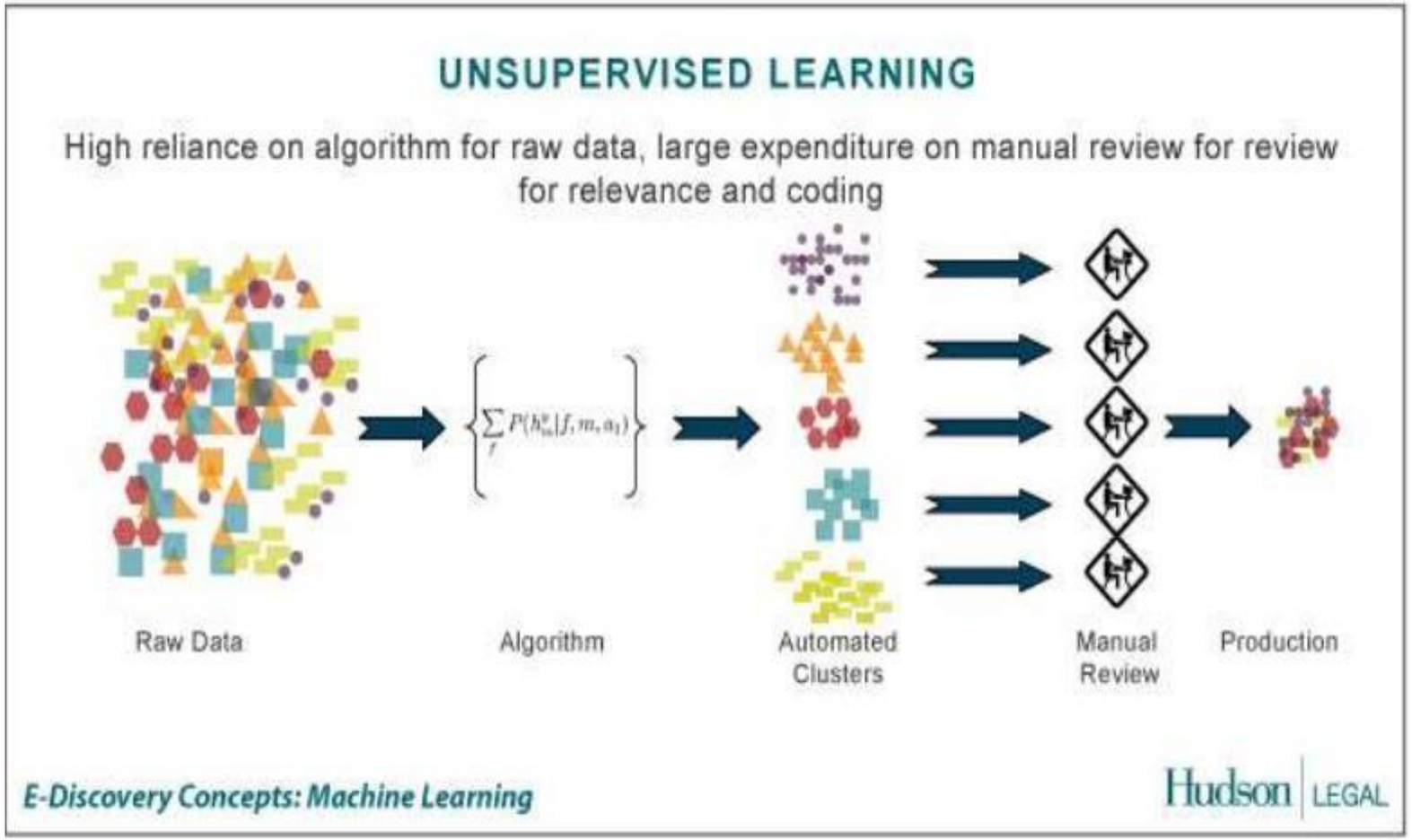
Unsupervised Learning

- Unsupervised learning needs no previous data as input.
- It is the method that allows the model to learn on its own using the data, which you give.
- Here, the data is not labelled, but the algorithm helps the model in forming clusters of similar types of data

Unsupervised Learning



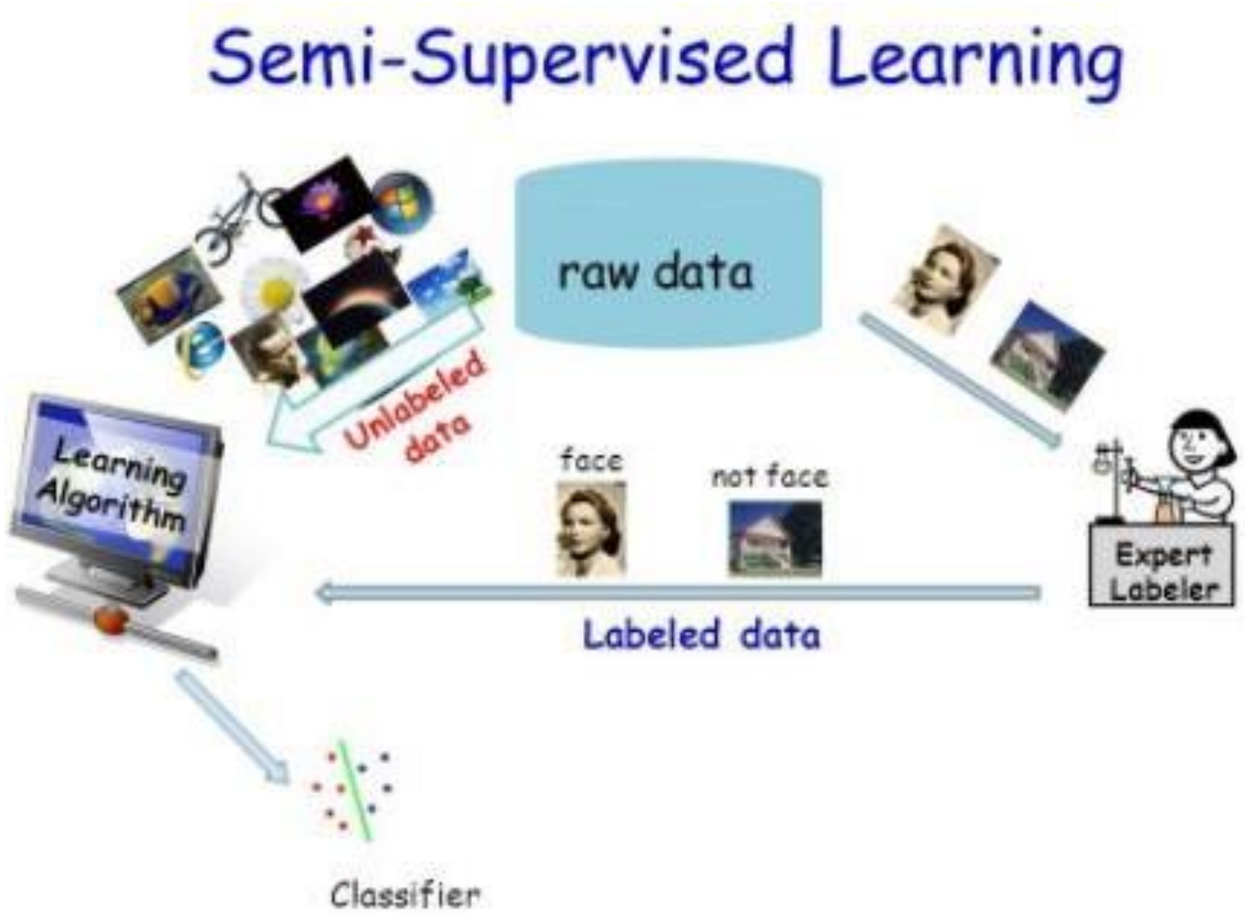
Unsupervised Learning



Semi-supervised Learning Method

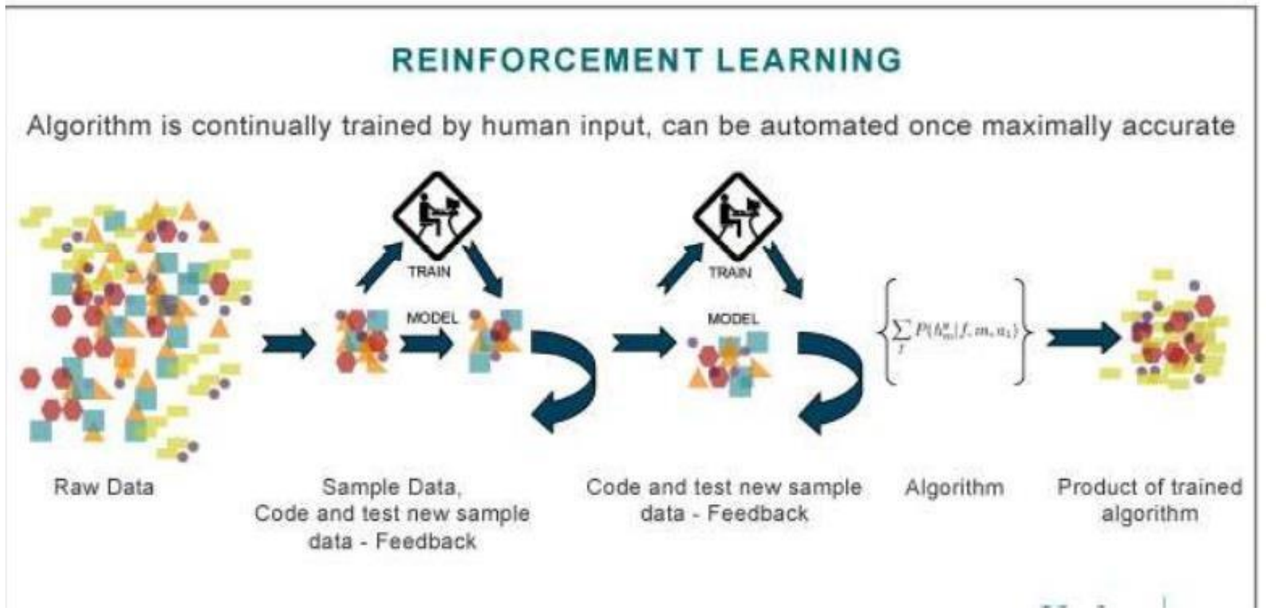
- This is a combination of supervised and unsupervised learning. This method helps to reduce the shortcomings of both the above learning methods.
- In supervised learning, labelling of data is manual work and is very costly as data is huge. In unsupervised learning, the areas of application are very limited. Toreduce these problems, semi-supervised learning is used.
- In this, the model first trains under unsupervised learning. This ensures that most of the unlabeled data divide into clusters.
- For the remaining unlabeled data, the generation of labels takes place and classification carries with ease.
- This technique is very useful in areas like speech recognition and analysis, protein classification, text classification, etc. This is a type of hybrid learning problem.

Semi-supervised Learning Method

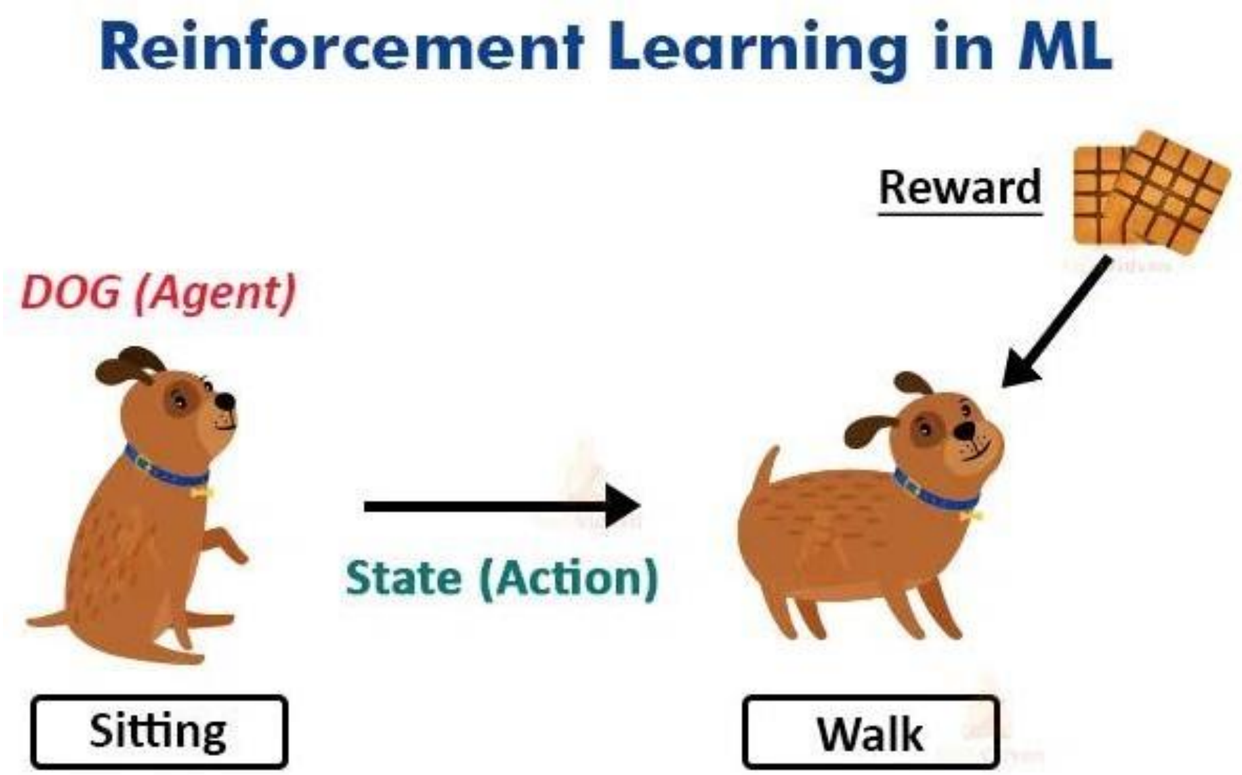


Reinforcement Learning

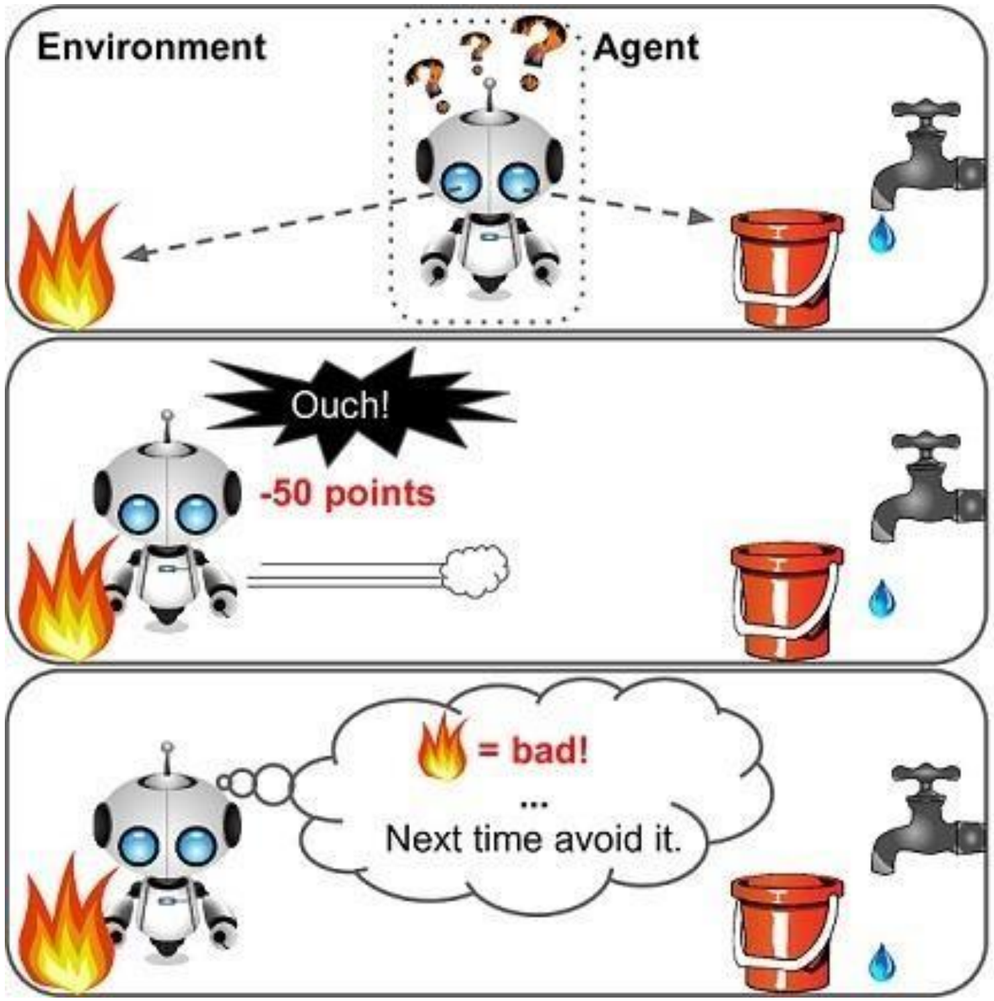
- Reinforcement Learning is enforcing models to learn how to make decisions.
- This type of learning is very awesome to learn and is one of the most researched fields in ML.
- The algorithm of this method helps to make the model learn based on feedback.



Reinforcement Learning



Reinforcement Learning



1. Observe
2. Select action using policy
3. Action!
4. Get reward or penalty
5. Update policy (learning step)
6. Iterate until an optimal policy is found

Assessment

What is Machine learning?

The autonomous acquisition of knowledge through the use of computer programs
The autonomous acquisition of knowledge through the use of manual programs
The selective acquisition of knowledge through the use of computer programs
The selective acquisition of knowledge through the use of manual programs

Different learning methods do not include?

Memorization
Analogy
Introduction
Deduction

Which of the following is a widely used and effective machine learning algorithm based on the idea of bagging?

Decision Tree
Random Forest
Regression
Classification

REFERENCES

1. Tom M. Mitchell, “Machine Learning”, McGraw-Hill Education (India) Private Limited, 2013.
2. Trevor Hastie, Robert Tibshirani, Jerome Friedman, “The Elements of Statistical Learning: Data Mining, Inference, and Prediction”, Springer; Second Edition, 2009.

THANK YOU