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Data Science

(Level-I)

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Session - 10

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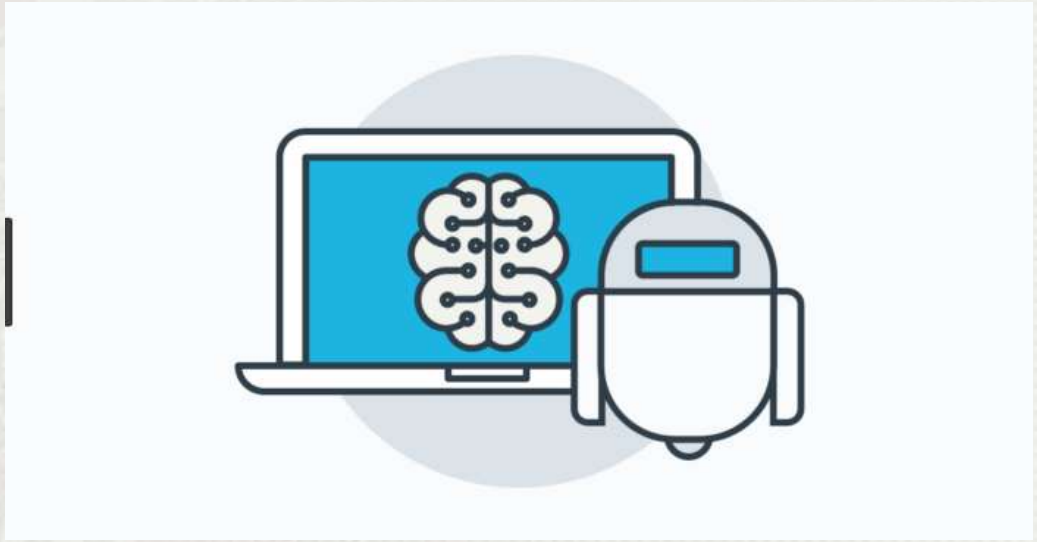
This session deals with

What is Machine Learning

Types of Machine Learning Techniques

Challenges in Machine Learning

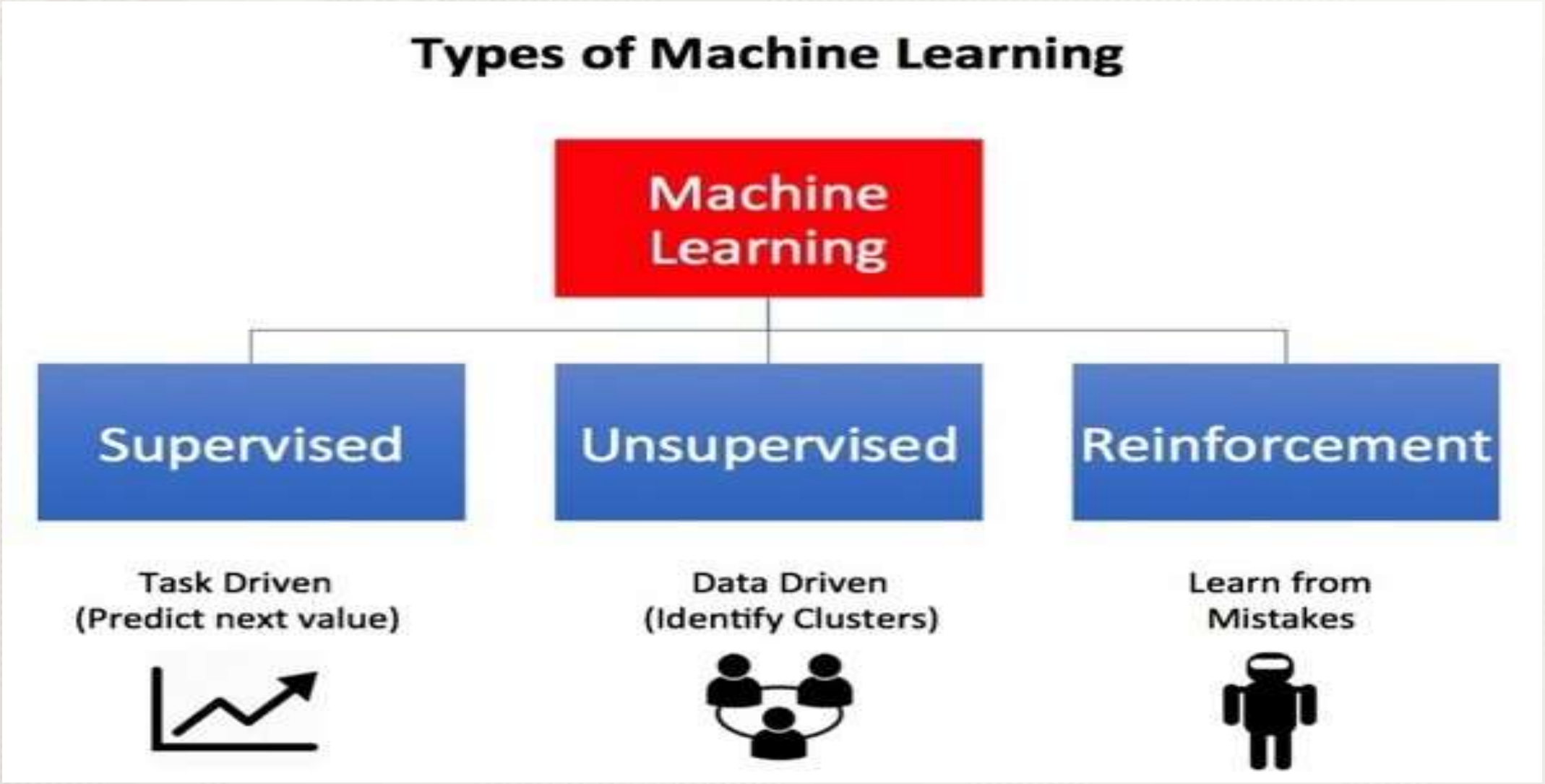
Machine Learning

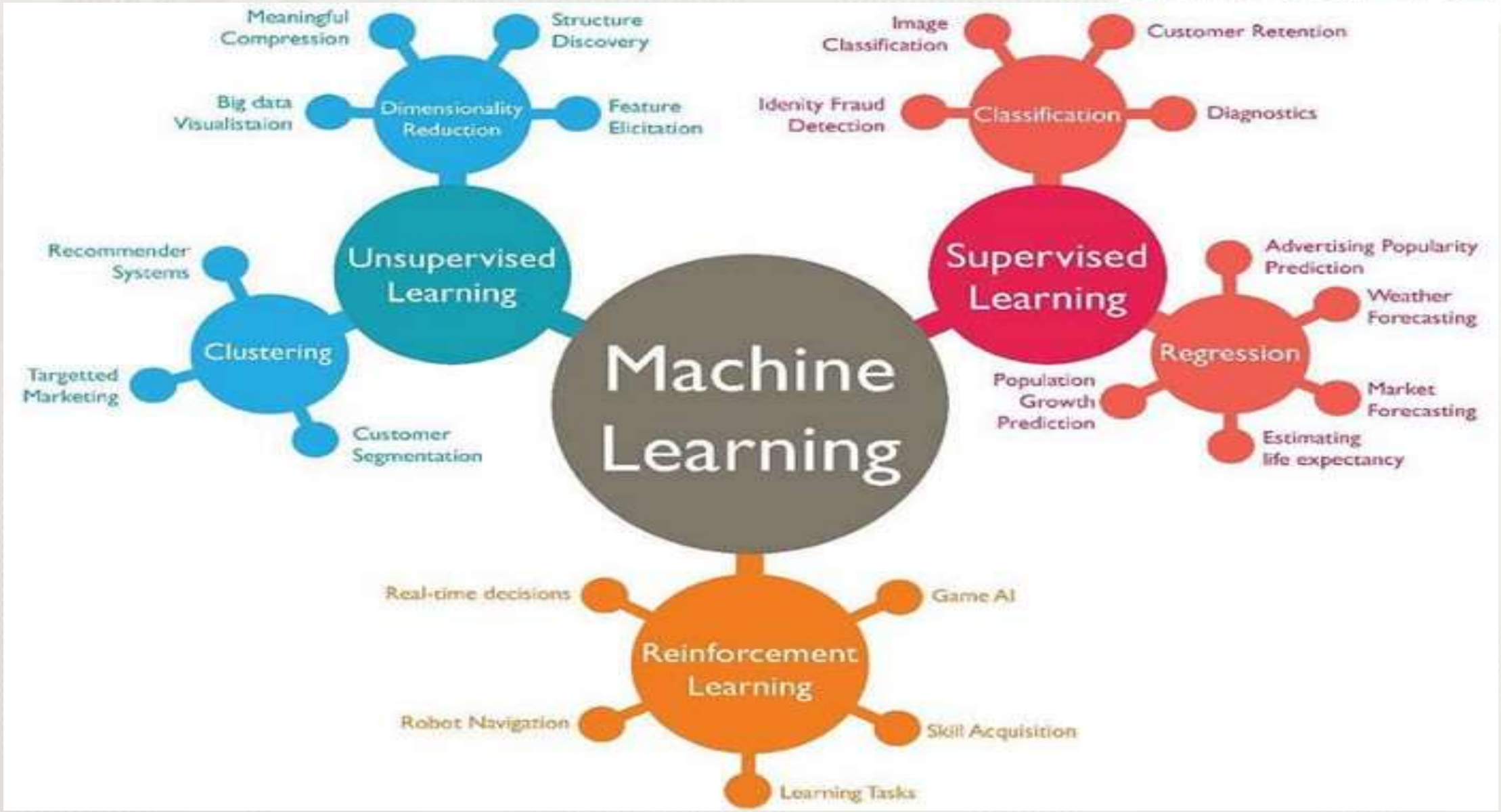


Machine learning (ML) is a category of an algorithm that allows software applications to become more accurate in predicting outcomes without being explicitly programmed.

The basic premise of machine learning is to build algorithms that can receive input data and use statistical analysis to predict an output while updating outputs as new data becomes available.

Types of ML


Types of Machine Learning
Machine Learning
Supervised
Unsupervised
Reinforcement
Task Driven
(Predict next value)
Data Driven
(Identify Clusters)
Learn from
Mistakes

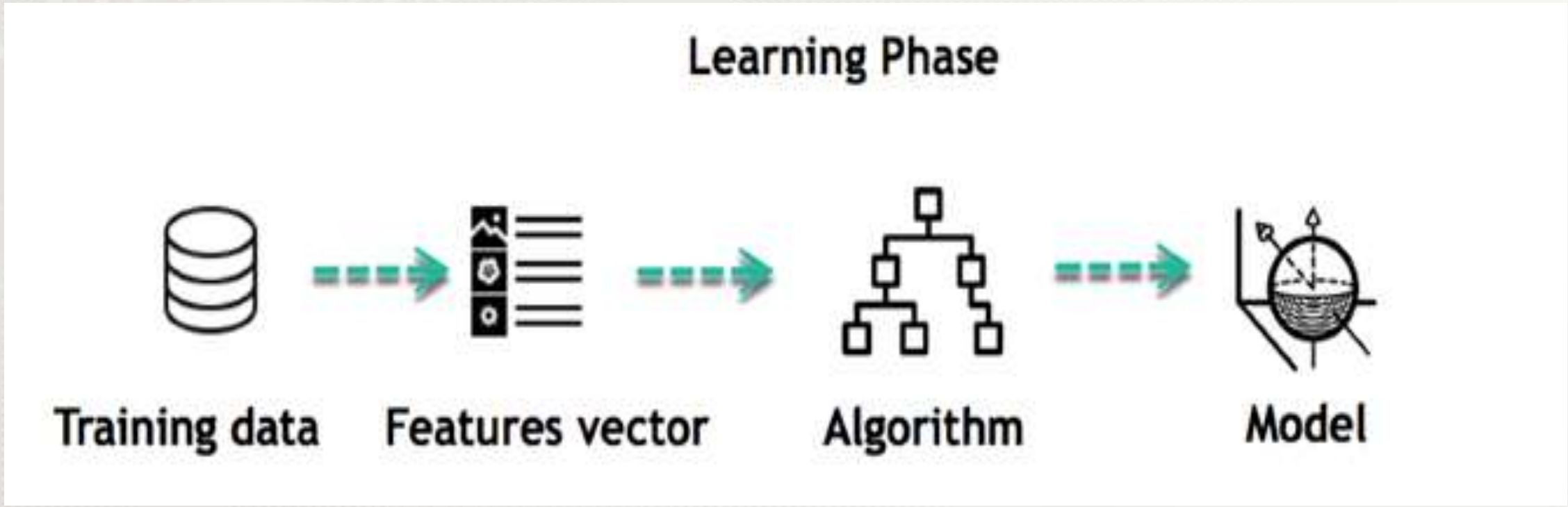

Machine Learning
Unsupervised Learning
Dimensionality Reduction
Meaningful Compression
Structure Discovery
Big data Visualistaion
Feature Elicitation
Clustering
Recommender Systems
Targetted Marketing
Customer Segmentation
Supervised Learning
Classification
Image Classification
Customer Retention
Idenity Fraud Detection
Diagnostics
Regression
Advertising Popularity Prediction
Weather Forecasting
Population Growth Prediction
Market Forecasting
Estimating life expectancy
Reinforcement Learning
Real-time decisions
Game AI
Robot Navigation
Skill Acquisition
Learning Tasks

Supervised Learning

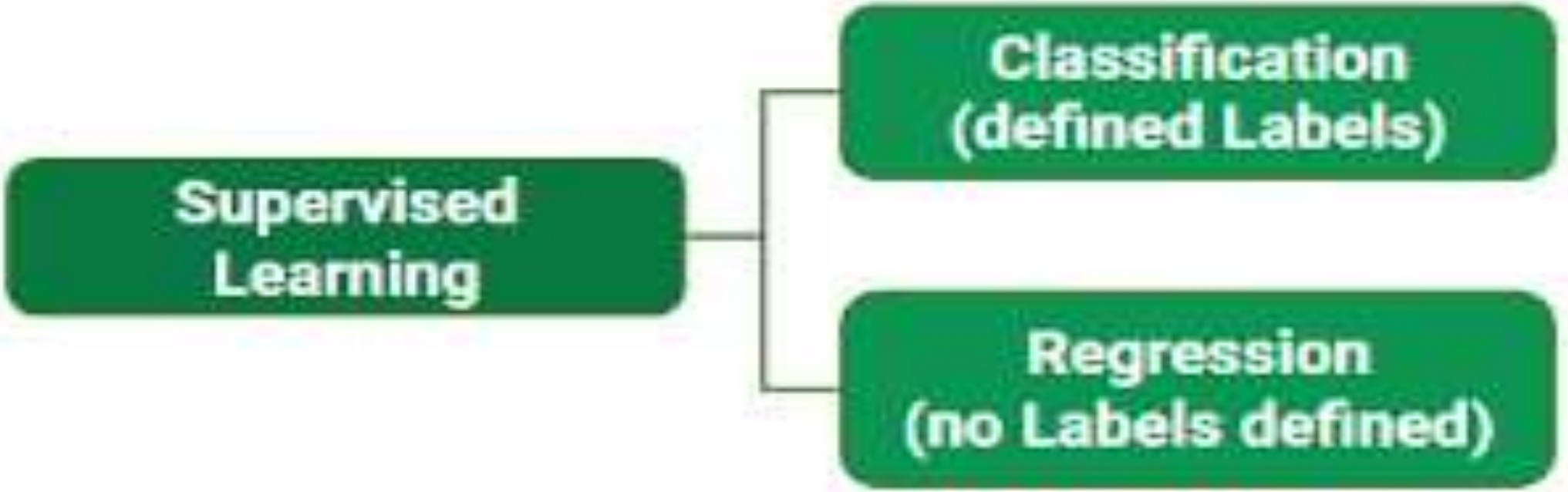
In Supervised learning, you train the machine using data which is well **"labeled**.
" It means some data is already tagged with the correct answer.

Example: we want to train a machine to help you predict how long it will take you to drive home from your workplace. Based on labeled data

Supervised Learning



Types of Supervised ML Algorithms



Regression

Regression technique predicts a single output value using training data.

Example

predict the house price from training data. The input variables will be locality, size of a house, etc.

Outputs always have a probabilistic interpretation, and the algorithm can be regularized to avoid overfitting.

Note

Logistic regression may underperform when there are multiple or non-linear decision boundaries.

It is not flexible for complex relationships and it is useful for binary classification

Classification

Classification means to group the output inside a class. If the algorithm tries to label input into two distinct classes, it is called binary classification.

Selecting between more than two classes is referred to as multiclass classification.

Example

Determining whether or not someone will be a defaulter of the loan.

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Multi class Classification

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Challenges in Supervised ML

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Irrelevant input feature present training data could give inaccurate results

Data preparation and pre-processing is always a challenge.

Accuracy suffers when impossible, unlikely, and incomplete values have been inputted as training data

Conclusion

You are aware of

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Types of Learning Algorithms

We will proceed with

More on Algorithms

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THANK YOU