MACHINE LEARNING TUTORIAL

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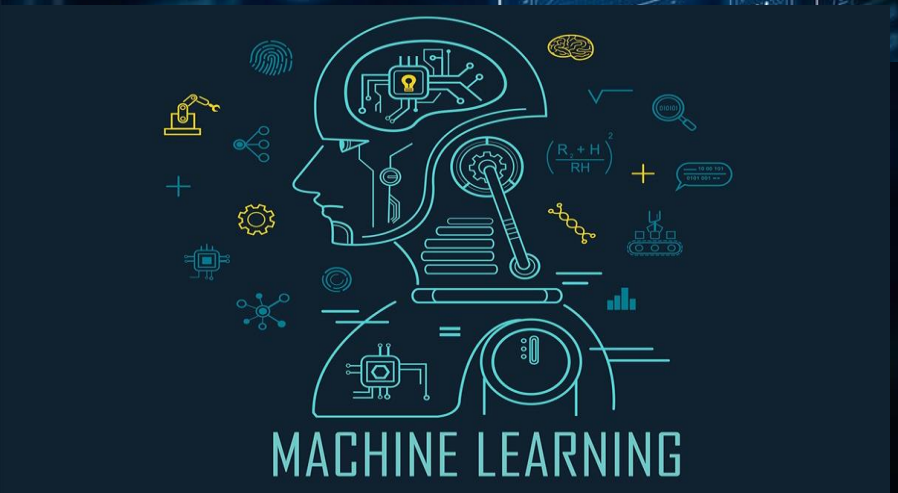
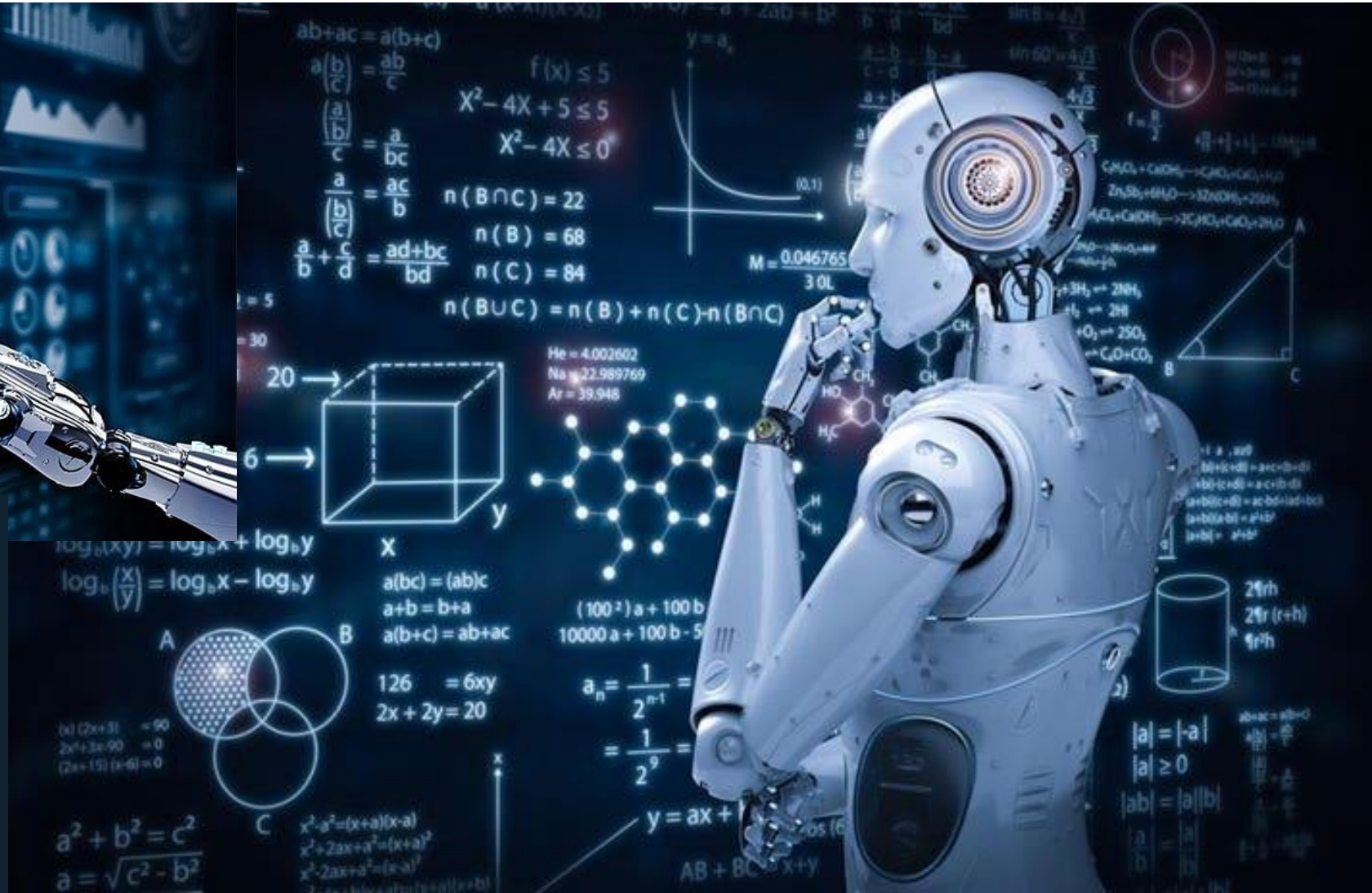
DATA SCIENCE & DATA ANALYTICS





WHAT IS MACHINE LEARNING ?

- ***Machine learning (ML) is a branch of artificial intelligence (AI) and computer science that focuses on the using data and algorithms to enable AI to imitate the way that humans learn, gradually improving its accuracy.***

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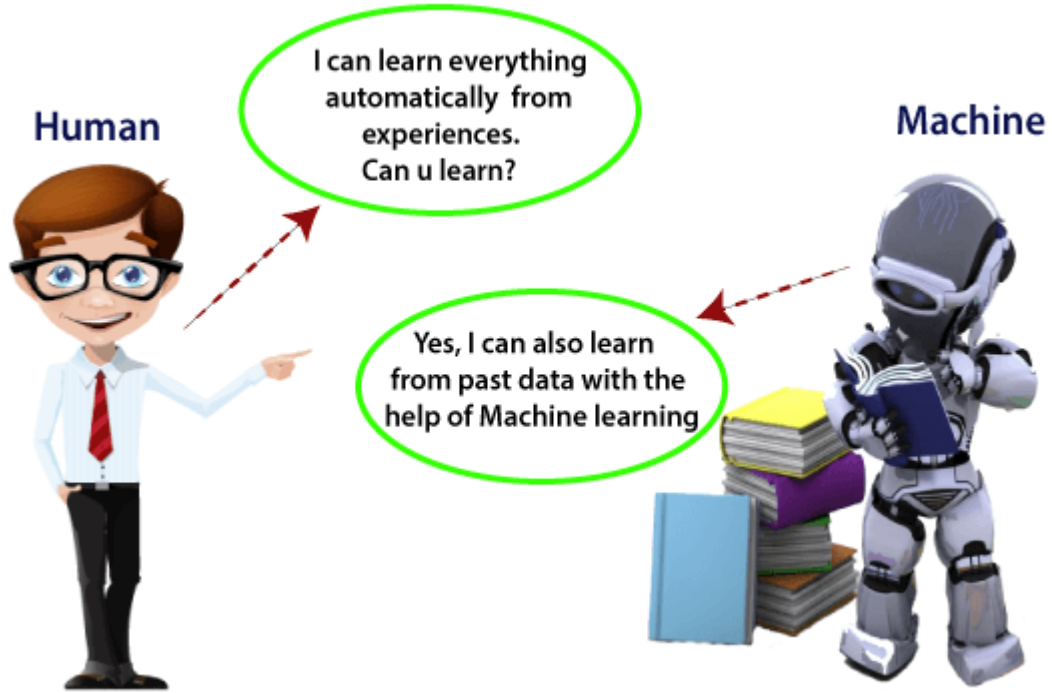
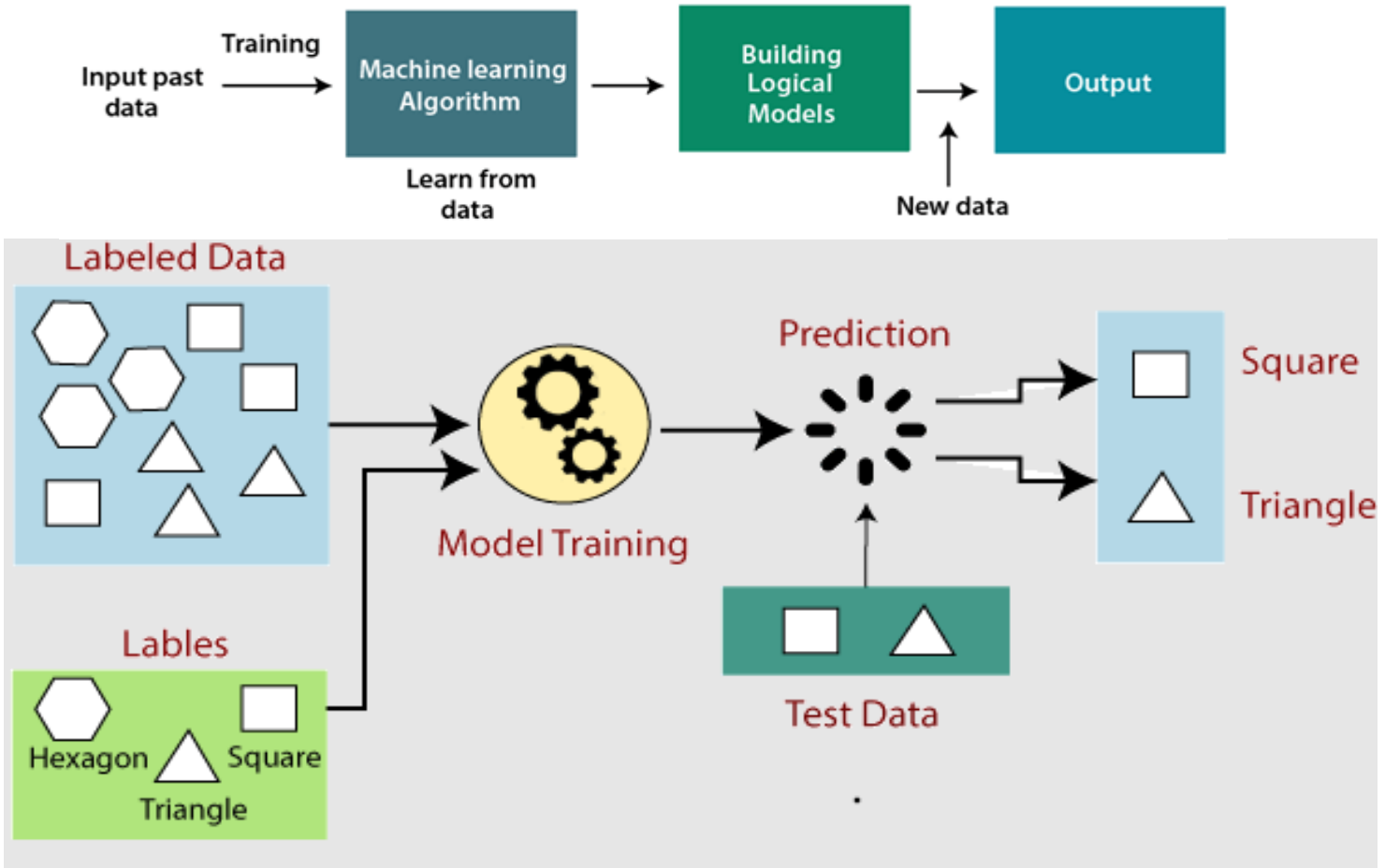
- ***Machine learning (ML) is defined as a discipline of artificial intelligence (AI) that provides machines the ability to automatically learn from data and past experiences to identify patterns and make predictions with minimal human intervention.***



How does Machine Learning work

A machine learning system builds prediction models, learns from previous data, and predicts the output of new data whenever it receives it. The amount of data helps to build a better model that accurately predicts the output, which in turn affects the accuracy of the predicted output.

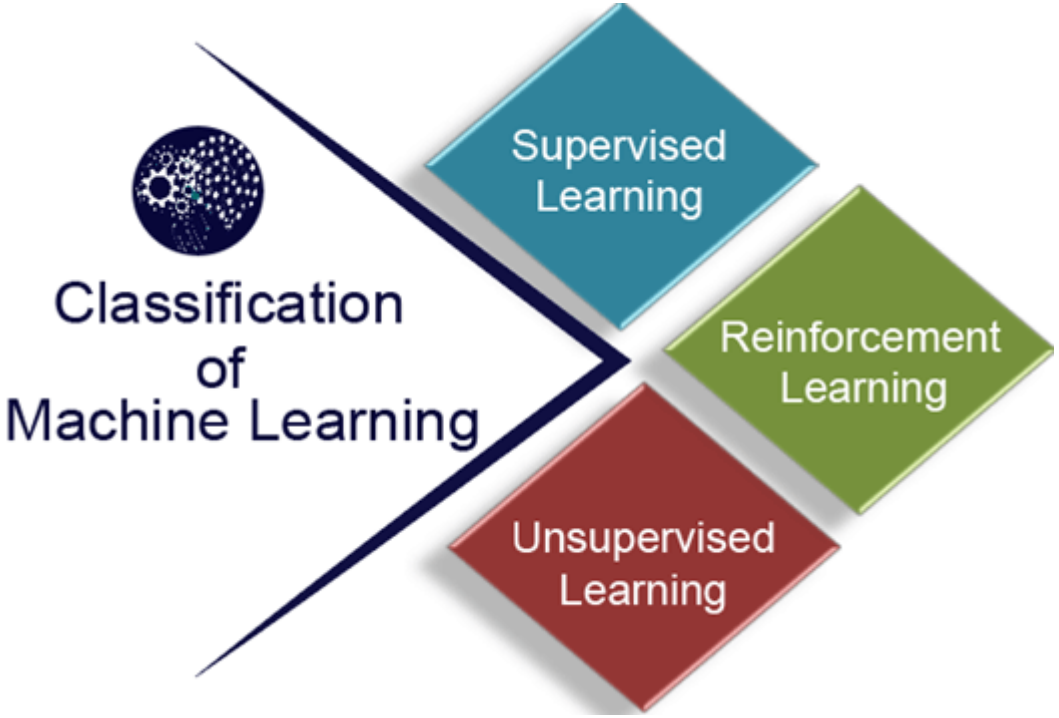


Features of Machine Learning:

- Machine learning uses data to detect various patterns in a given dataset.
- It can learn from past data and improve automatically.
- It is a data-driven technology.
- Machine learning is much similar to data mining as it also deals with the huge amount of the data.

TYPE OF MACHINE LEARNING

- ❖ Supervised Machine learning
- ❖ Unsupervised Machine learning
- ❖ Reinforcement Machine Learning



SUPERVISED LEARNING

- In supervised learning, sample labeled data are provided to the machine learning system for training, and the system then predicts the output based on the training data.
- The system uses labeled data to build a model that understands the datasets and learns about each one. After the training and processing are done, we test the model with sample data to see if it can accurately predict the output.

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This type of ML involves supervision, where machines are trained on labeled datasets and enabled to predict outputs based on the provided training. The labeled dataset specifies that some input and output parameters are already mapped.

Types of Supervised Learning

1. Classification ***2. Regression***

1.) Classification: These refer to algorithms that address classification problems where the output variable is categorical; for example, yes or no, true or false, male or female, etc. Real-world applications of this category are evident in spam detection and email filtering.

2.) Regression: Regression algorithms handle regression problems where input and output variables have a linear relationship. These are known to predict continuous output variables. Examples include weather prediction, market trend analysis, etc.

UNSUPERVISED LEARNING

- *Unsupervised learning is a learning method in which a machine learns without any supervision.*
- *The training is provided to the machine with the set of data that has not been labeled, classified, or categorized, and the algorithm needs to act on that data without any supervision. The goal of unsupervised learning is to restructure the input data into new features or a group of objects with similar patterns.*

- *1. Clustering*
- *2. Association*

Real Time Example

1. Facial recognition
2. Product recommendations
3. Email automation and spam filtering
4. Financial accuracy
5. Social media optimization
6. Healthcare advancement
7. Mobile voice to text and predictive text
8. Predictive analytics.

MACHINE LEARNING ALGORITHMS

1. SIMPLE LINEAR REGRESSION
2. MULTIPLE LINEAR REGRESSION
3. LOGISTIC REGRESSION
4. DECISION TREE
5. SVM
6. KNN