Hare Krishna

Cloud Computing

Topic

Machine Learning

Roll No.0003

It's Me-Ishu boy

MACHINE LEARNING

- Machine learning is a type of artificial intelligence that allows systems to automatically improve their performance on a task by learning from experience. It is a key technology driving many recent advances in artificial intelligence, from virtual assistants like Siri and Alexa to self-driving cars and personalized product recommendations.

- Machine learning is the ability to adapt to new data independently and through iterations. Applications learn from previous computations and transactions and use “pattern recognition” to produce reliable and informed results.

Machine learning is set of techniques to make Computer better at doing things that humans can't do better then machines

Human — 985474363545*9878987678 in 10 second

Machine ——

Yah To Mere bayen Hath ka khel hai

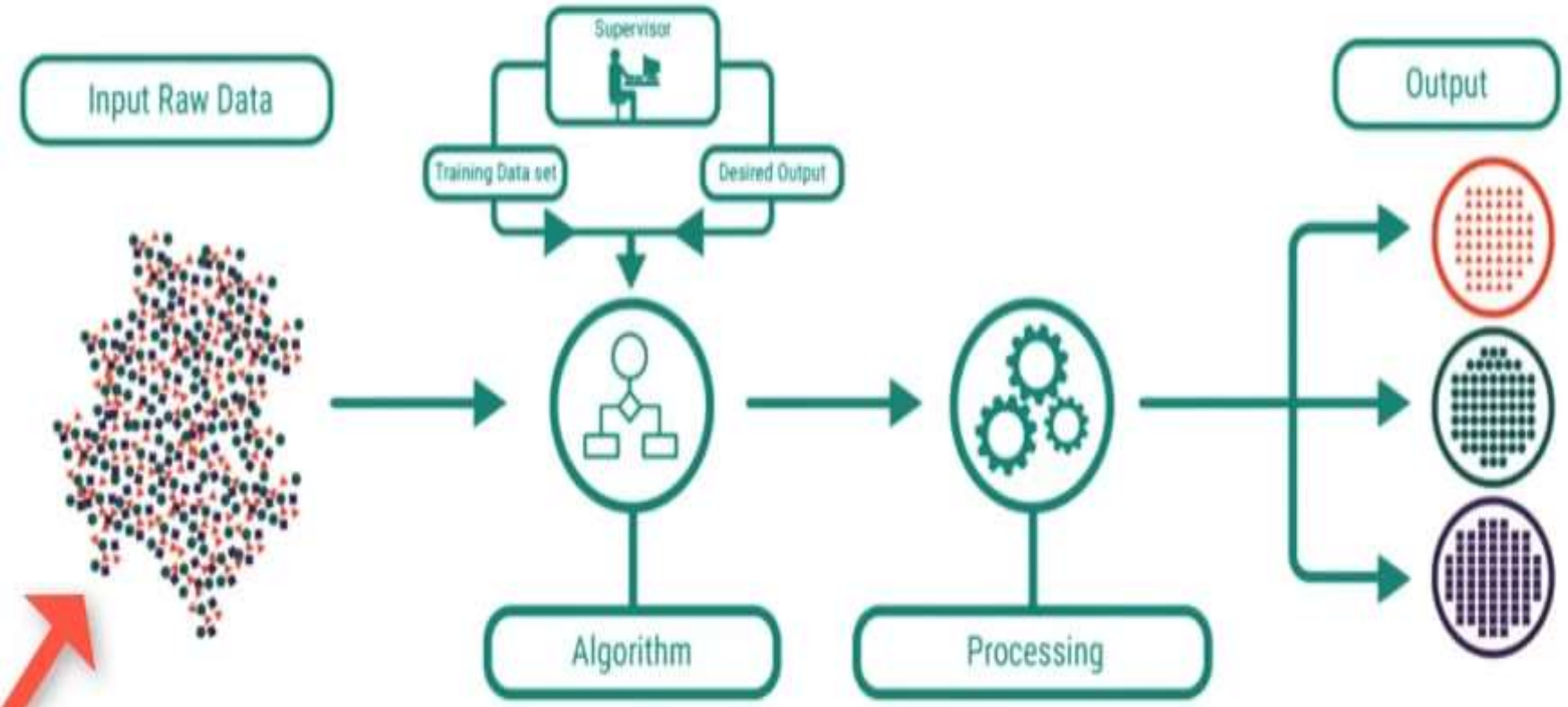
9657213119191111110

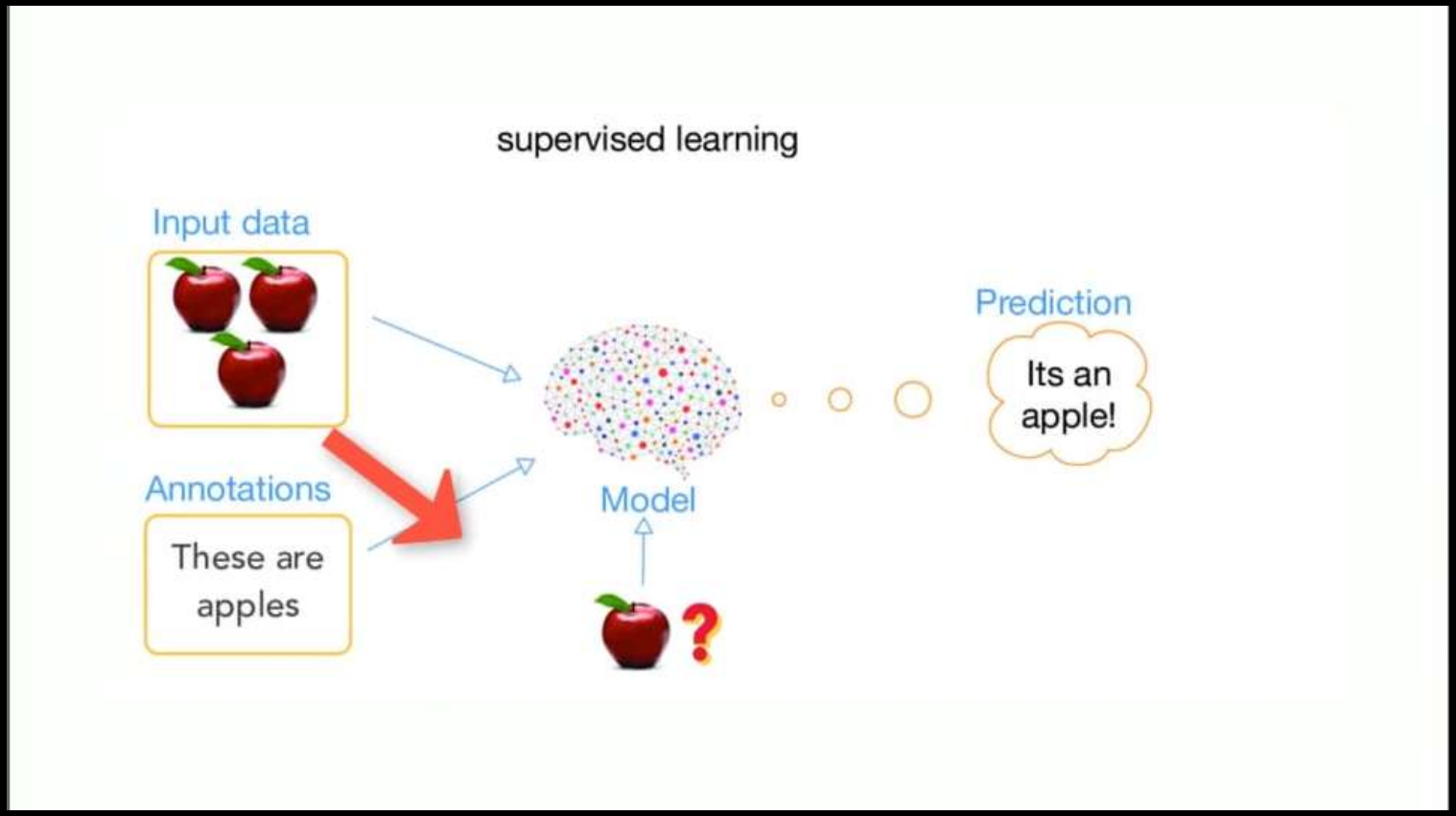
TYPES OF MACHINE LEARNING

- **1. Supervised Learning**
- **2. Unsupervised Learning**
- **3. Semi-supervised Learning**
- **4.Reinforcement**

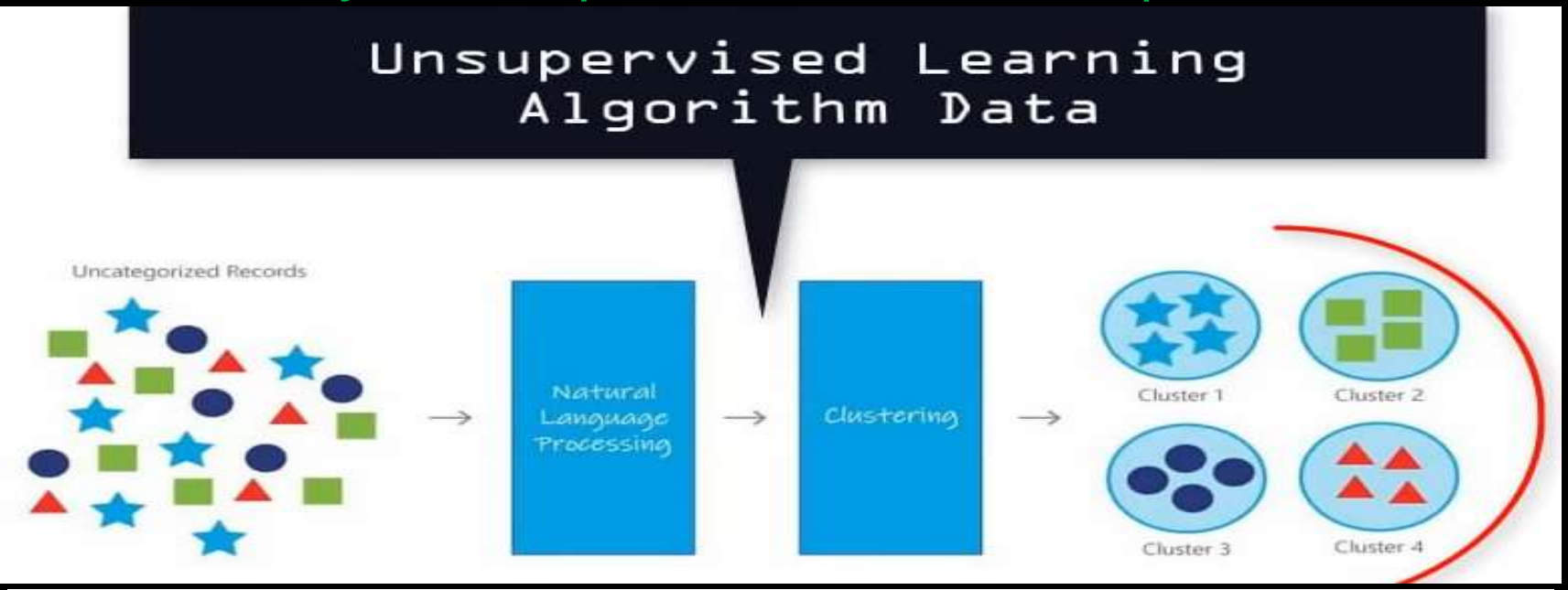
1.Input Raw Data: The process starts with raw data that is fed into the system. This data can be anything from images, text, or numerical data.
2.Training Data set: The raw data is then divided into a training data set. This training set is what the machine learning algorithm learns from.
3.Supervisor: The supervisor is responsible for providing the "correct" answers, or labels, for the data in the training set. For example, if the data is images of animals, the supervisor would label each image with the correct animal name (e.g., "dog," "cat," "bird").
4.Desired Output: This refers to the expected outcome or prediction that the model should be able to make after learning from the training data.
5.Algorithm: The core of the process is the algorithm. It's the set of rules or procedures that the machine learning model uses to learn from the training data and predict the desired output for new data.
6.Processing: The algorithm processes the training data and learns to identify patterns and relationships.
7.Output: The output is the result of the machine learning model's learning. This could be a classification (e.g., identifying the type of animal in a new image), a prediction (e.g., forecasting sales for a product), or another desired outcome.

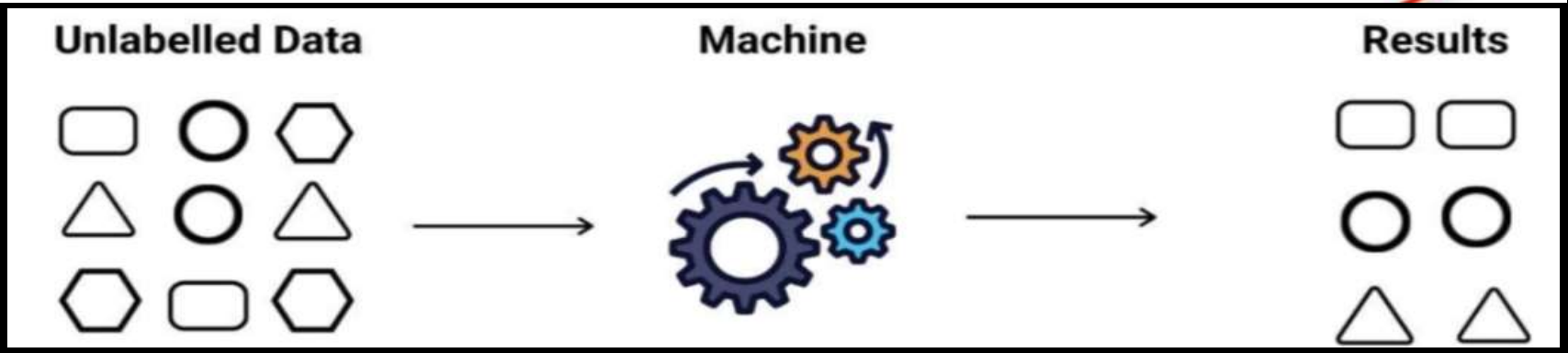
SUPERVISED LEARNING




supervised learning
Input data
Annotations
These are apples
Model
Prediction
Its an apple!

- **2. Unsupervised Learning-**The algorithm is trained on unlabeled data to discover patterns or structure
- Goal: Identify hidden patterns or relationships in data



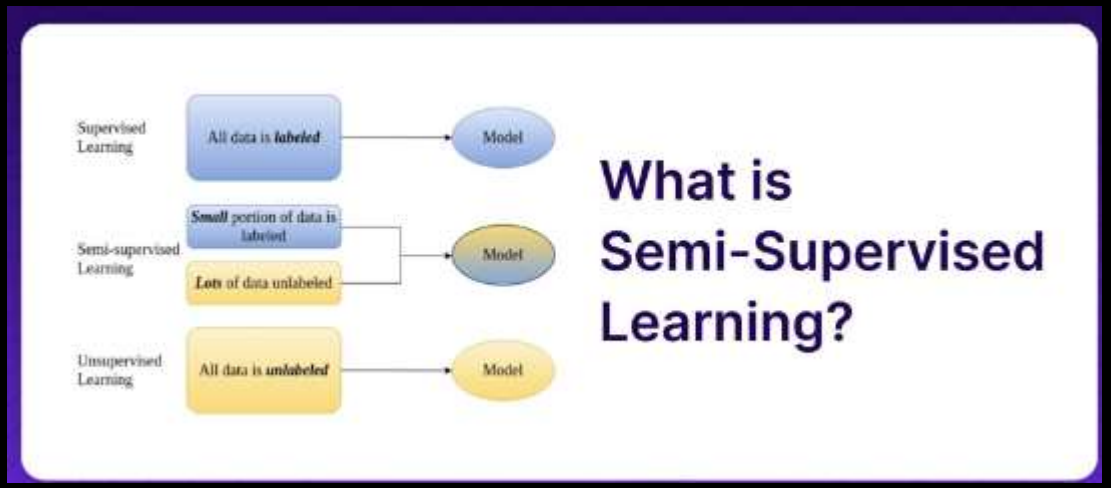


Natural Language Processing (NLP)--
Natural Language Processing (NLP) is a field of computer science and artificial intelligence that focuses on enabling computers to understand, interpret, and generate human language. It aims to bridge the gap between human communication and computer processing.

*Clustering is an unsupervised learning technique in machine learning that groups data points based on their similarity. It aims to discover patterns and structures within unlabeled data without prior knowledge of the groups.

3. Semi-supervised Learning

- The algorithm is trained on a combination of labeled and unlabeled data
- Goal: Improve the accuracy of supervised learning models by leveraging unlabeled data
- Examples: Speech recognition, natural language processing



Reinforcement Learning in ML

Reinforcement learning is like teaching a dog a new trick. You start by giving the dog a treat every time it does something right. The dog learns that doing the right thing gets it a treat, and it wants more treats!

- **Input raw data:** This is like the information the dog sees and hears. It could be a sound, a smell, or a visual cue.
- **Environment:** This is the world the dog lives in. It's everything that the dog interacts with, like the people, the house, and the toys.
- **Agent:** The dog is the agent. It's the one who learns and makes decisions.
- **State:** This is the specific situation the dog is in at any given moment. For example, if the dog is sitting, that's its current state.
- **Best action:** This is the best thing the dog can do in that specific situation to get a treat (or a reward).
- **Reward:** This is the treat the dog gets for doing the right thing. It's the positive feedback that makes the dog want to keep doing the right thing.
- **Selection of algorithm:** This is like the dog's brain. It's what helps the dog decide how to get the treat.
- **Output:** This is what the dog does as a result of learning. It's the new trick it has learned!

AWS Services related to Machine Learning:

- **Amazon SageMaker:** A fully managed service for building, training, and deploying machine learning models. It provides tools and infrastructure to simplify the entire machine learning workflow.
- **Amazon Comprehend:** A natural language processing (NLP) service that enables you to understand the meaning and structure of text data. It can perform tasks like sentiment analysis, key phrase extraction, and entity recognition.
- **AWS DeepLens:** A deep learning-enabled camera that allows developers to build and deploy computer vision models. It's designed for experimentation and prototyping.
- **Amazon Lex:** A service for building conversational chatbots and voice interfaces. It uses deep learning to understand user intent and provide appropriate responses.
- **Amazon Polly:** A text-to-speech service that converts written text into natural-sounding speech. It's used in applications requiring spoken output.
- **Rekognition:** A computer vision service that allows you to analyze images and videos. It can perform tasks like object detection, facial recognition, and image moderation.
- **Amazon Transcribe:** An automatic speech recognition service that converts audio to text. It's useful for transcribing meetings, interviews, or any spoken content.
- **Amazon Translate:** A machine translation service that translates text between multiple languages. It supports a wide range of languages and can be used for document translation or real-time communication.