ScaleÛp Analytics

Hands-on Machine Learning With Python: Build, Train & Deploy

Organized by:
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About Trainer

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- Sr. Analyst at Global Credit Bureau
- Masters in Statistics from SPPU
- Founder of ScaleÛp Analytics
- Conducted multiple courses and workshops

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Course Objectives

01 Understand Machine Learning basic concepts and industry applications

02 Equipped with Python to develop ML Models

03 Learn theory and implementation of important algorithms in ML

04 Learn Model Deployment on Streamlit Web App

05 Practice hands-on with real-world datasets and build ML Models

What you will gain after the course?

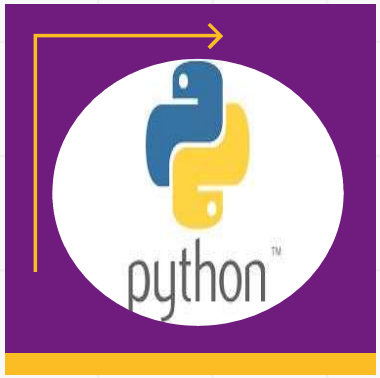
Practical Tools and Experience:

1. Gain hands-on experience with Python, ML algos, Streamlit, Github
2. Identify patterns, trends, and insights in data - EDA
3. Apply skills to real-world projects and case studies

Career Advancement:

4. Become a high-demand data analyst/ ML engineer in a rapidly growing field
5. Enhance your resume with most trending skills in analytics
6. Gain upper hand in the data science market by learning the technical skills in academics

Machine Learning Tools/Libraries



Course Outline

01 Introduction to ML and Python

02 Gradient descent and core ML concepts

03 Supervised Learning

04 Unsupervised Learning

05 Model Building and validation

06 Model deployment using Streamlit and Github

07 End to end case study

08 Capstone Projects

Advance Topics

01 Imbalance Data Handling

02 Advanced Feature Engineering

03 Outliers Treatment

04 Methods to Reduce Overfitting

05 Hyper-parameter Tuning

06 Tree Based Algorithms

Ready to Begin!

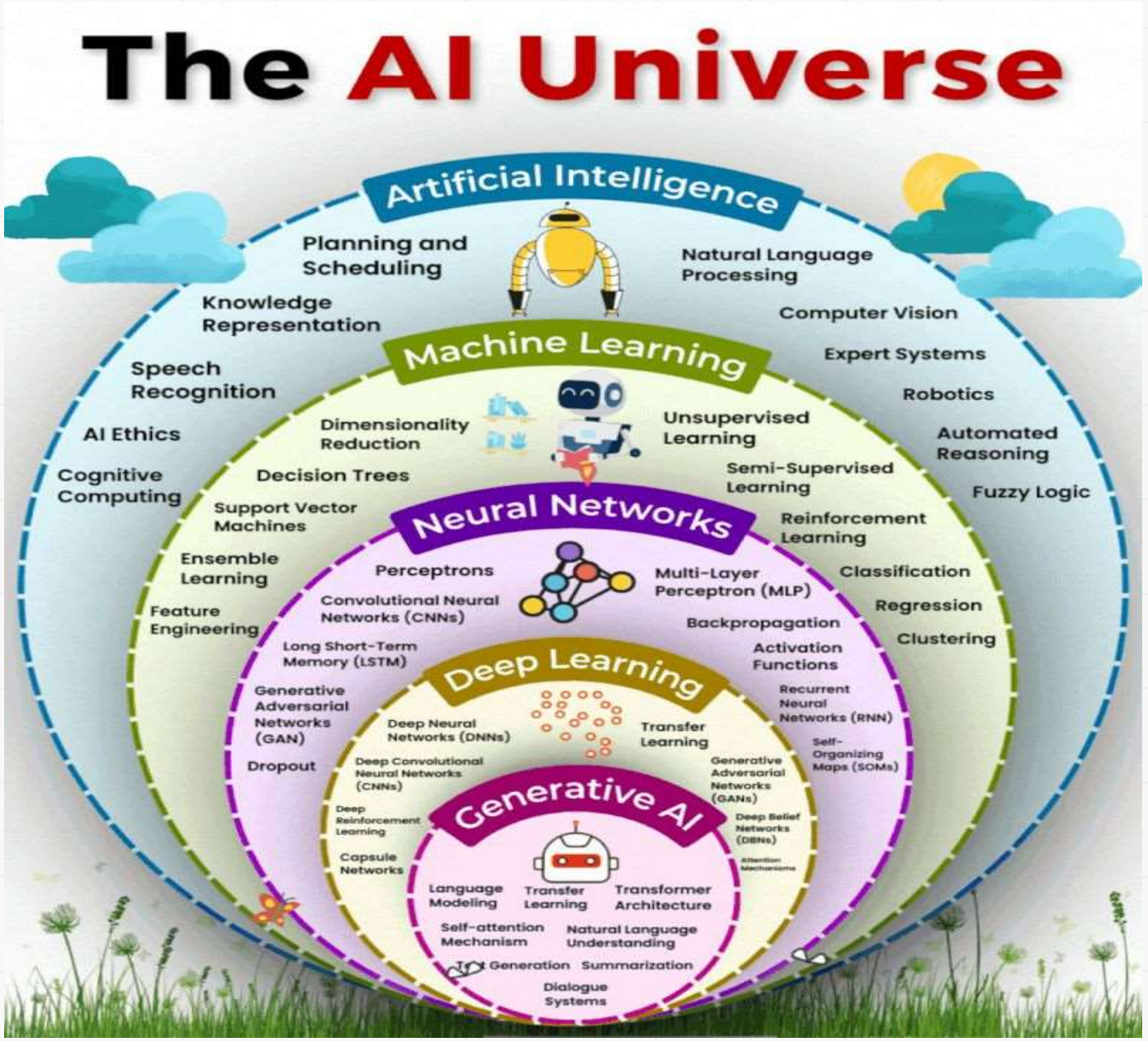
01 Introduction to ML and Python

01
Bird's eye view of ML

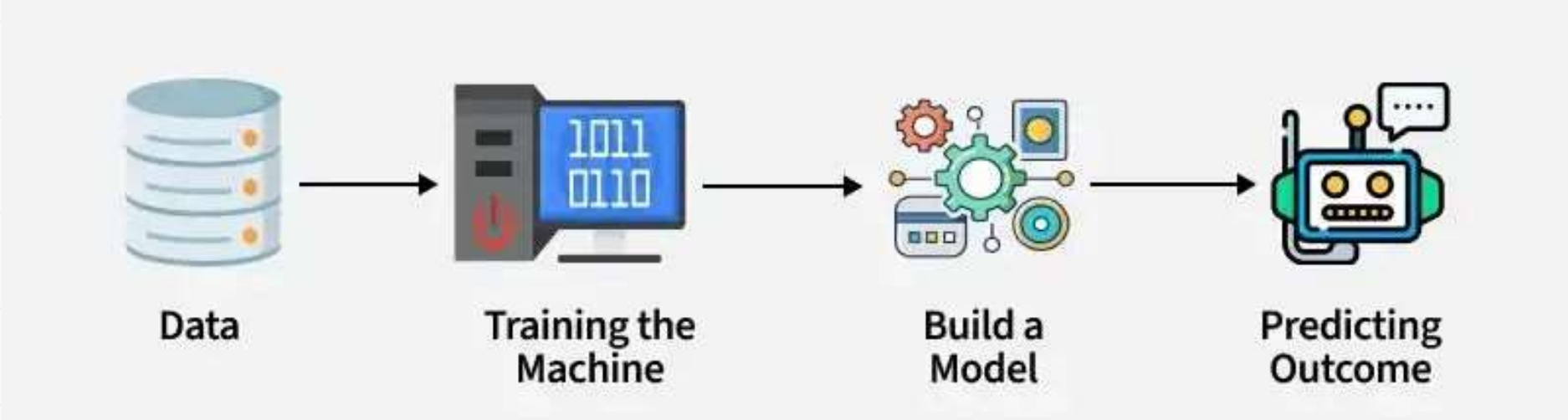
02
Types of Machine Learning

03
Important ML concepts

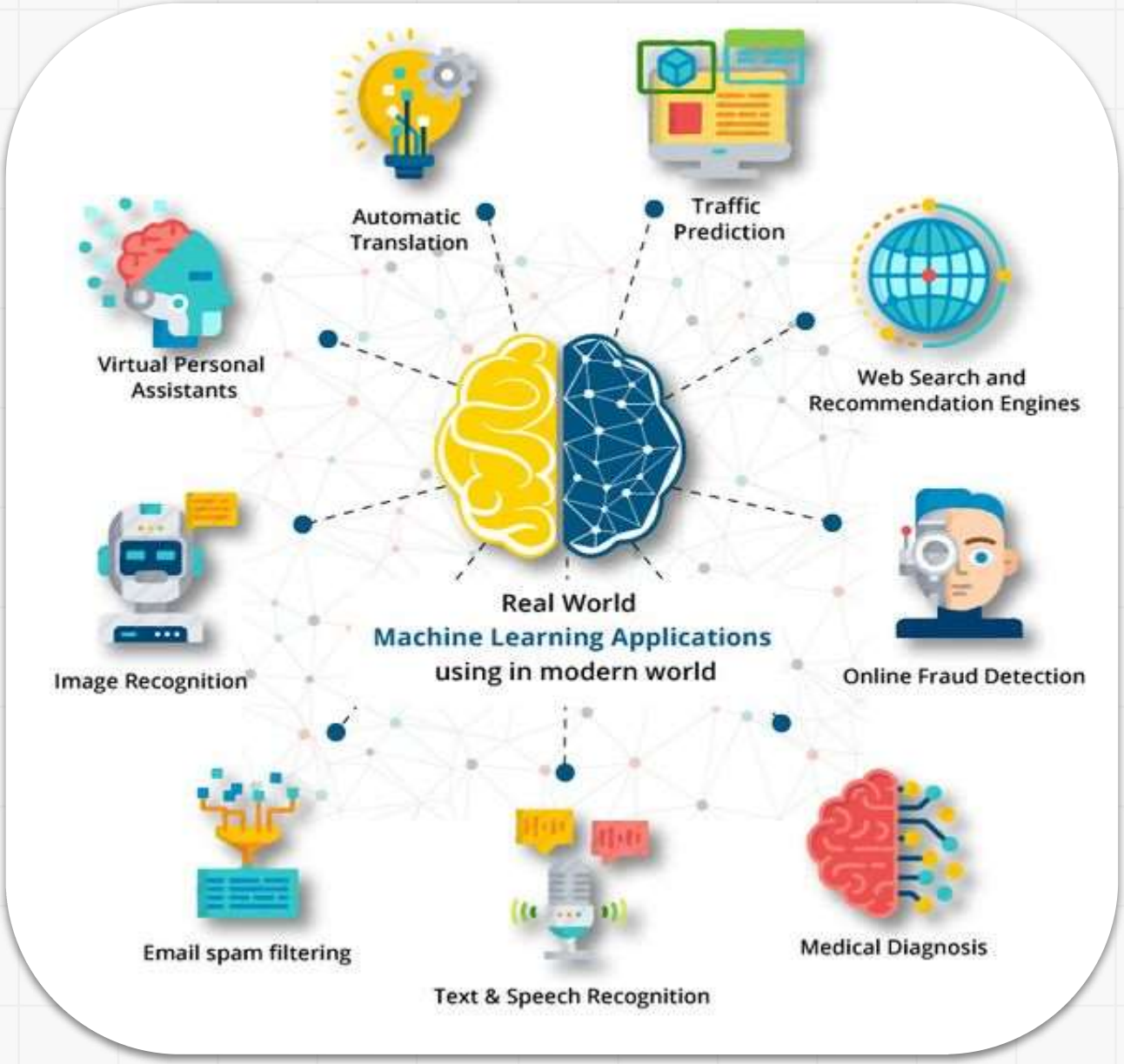
04
Introduction to Python


The AI Universe
Artificial Intelligence
Planning and Scheduling
Knowledge Representation
Speech Recognition
AI Ethics
Cognitive Computing
Natural Language Processing
Computer Vision
Expert Systems
Robotics
Automated Reasoning
Fuzzy Logic
Machine Learning
Dimensionality Reduction
Decision Trees
Support Vector Machines
Ensemble Learning
Feature Engineering
Unsupervised Learning
Semi-Supervised Learning
Reinforcement Learning
Classification
Regression
Clustering
Neural Networks
Perceptrons
Convolutional Neural Networks (CNNs)
Long Short-Term Memory (LSTM)
Multi-Layer Perceptron (MLP)
Backpropagation
Activation Functions
Deep Learning
Generative Adversarial Networks (GAN)
Dropout
Deep Neural Networks (DNNs)
Deep Convolutional Neural Networks (CNNs)
Deep Reinforcement Learning
Capsule Networks
Transfer Learning
Recurrent Neural Networks (RNN)
Self-Organizing Maps (SOMs)
Generative Adversarial Networks (GANs)
Deep Belief Networks (DBNs)
Generative AI
Language Modeling
Transfer Learning
Transformer Architecture
Self-attention Mechanism
Natural Language Understanding
Generation
Summarization
Dialogue Systems

What is ML?



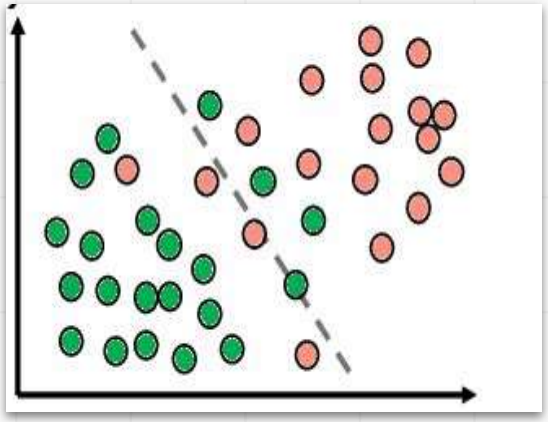
Machine Learning (ML) is like **teaching a computer how to learn from experience**, just like humans do. Instead of programming it with fixed rules, we give it lots of examples, and it figures out patterns on its own.


Automatic Translation
Traffic Prediction
Virtual Personal Assistants
Web Search and Recommendation Engines
Real World
Machine Learning Applications
using in modern world
Image Recognition
Online Fraud Detection
Email spam filtering
Text & Speech Recognition
Medical Diagnosis

Types of Machine Learning

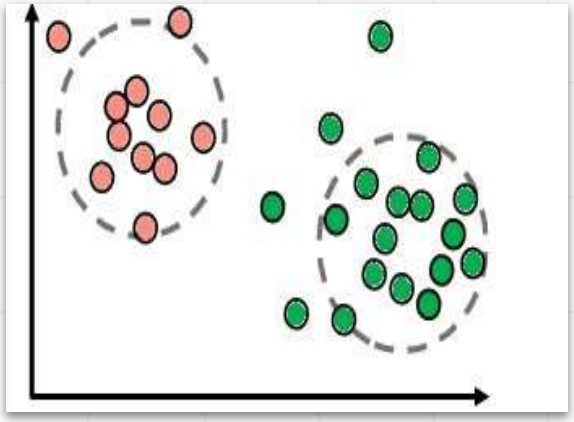
Supervised

Labels available



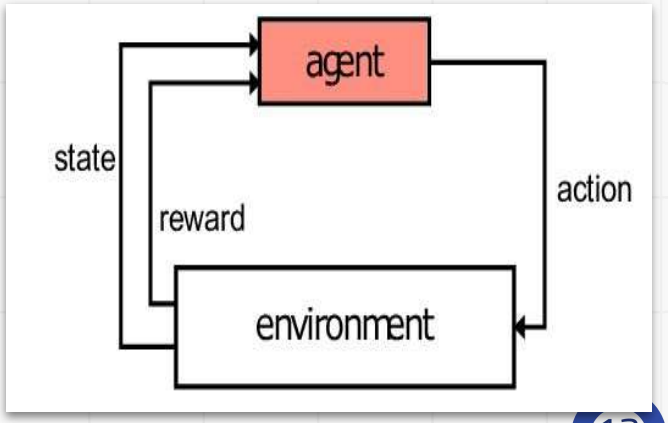
Un-supervised

Labels not available



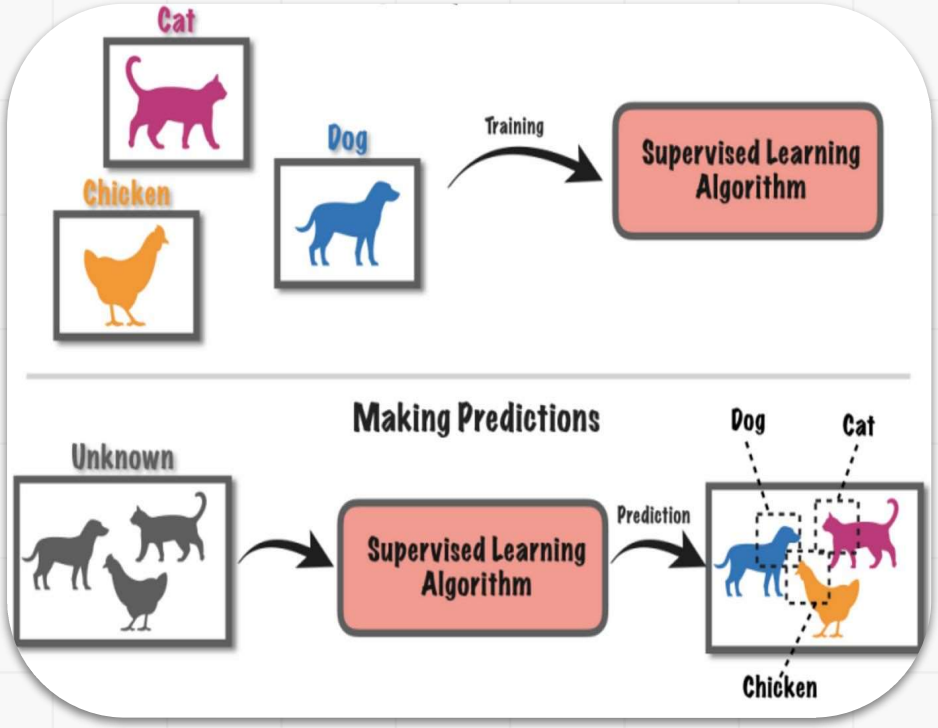
Reinforcement

Involves agent , environment and Reward mechanism

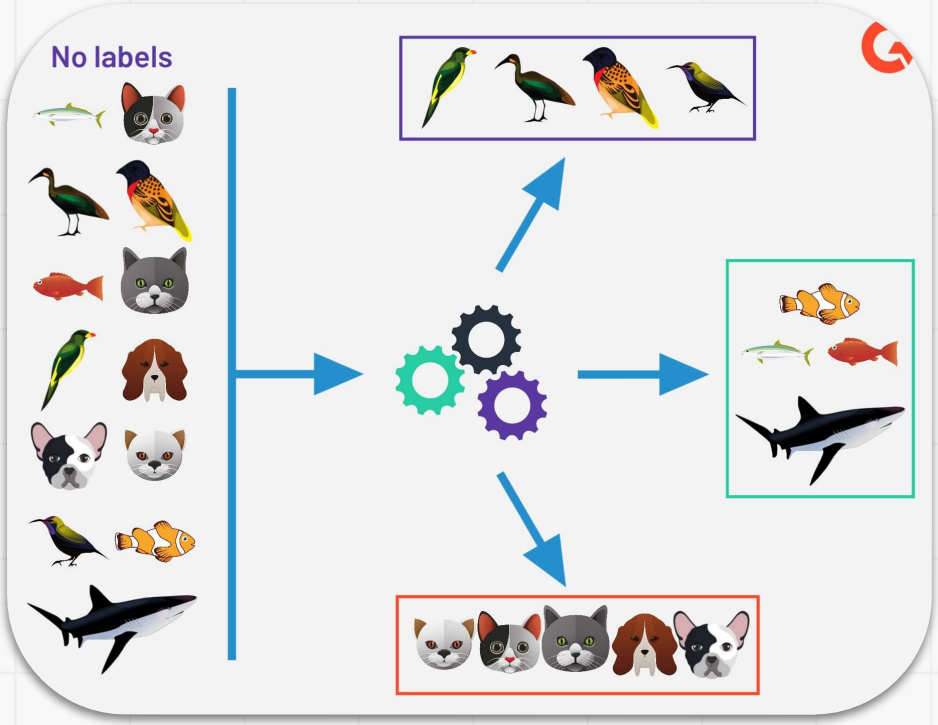


Types of Machine Learning

Supervised Learning



Un-Supervised Learning



Supervised Learning

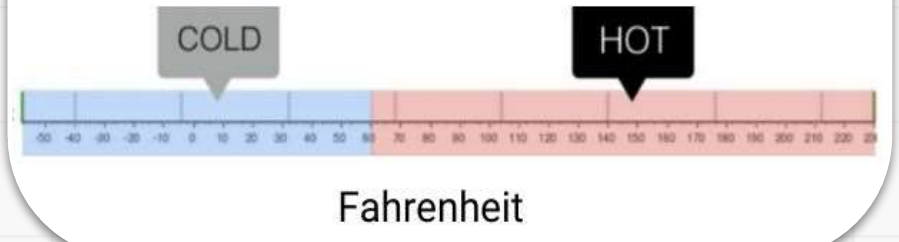
Regression

What will be the temperature tomorrow?

Continuous Output

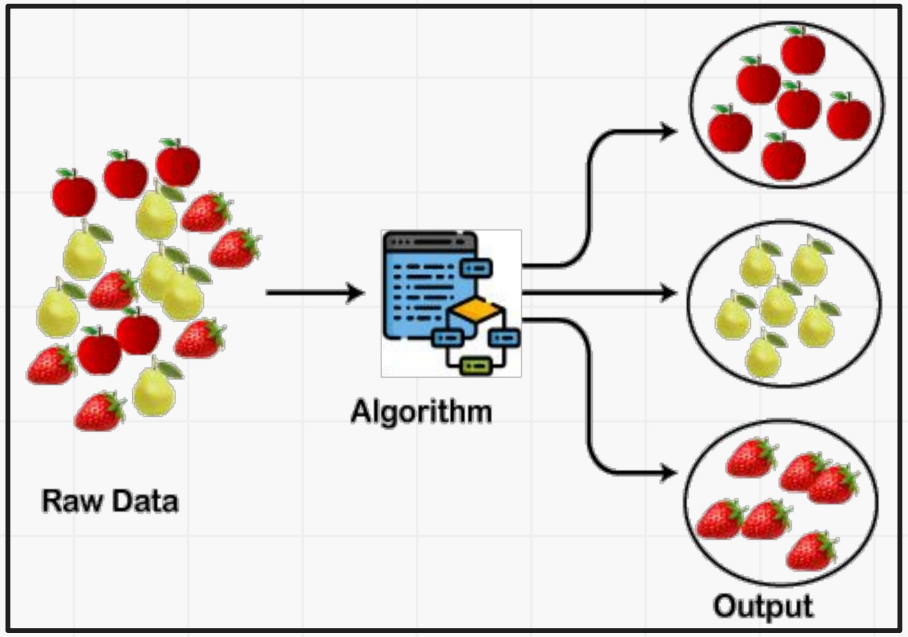
Classification

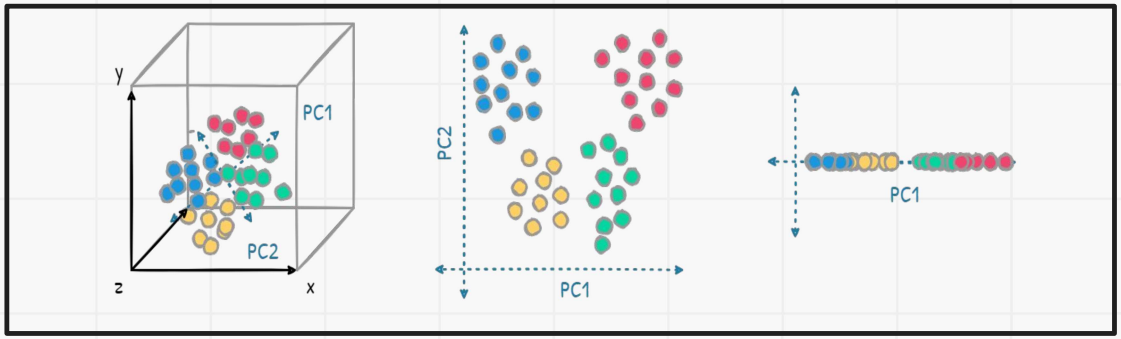
Will it be hot or cold tomorrow?



Categorical Output

Un-Supervised Learning





Clustering

Dimensionality Reduction

Difference

Feature	Supervised Learning	Unsupervised Learning
Definition	Learns from labeled data (input-output pairs).	Learns patterns from unlabeled data.
Types	Classification, Regression.	Clustering, Association, Dimensionality Reduction.
Labels	Requires labeled data (X → Y).	No labels, only input data (X).
Goal	Predict output based on past examples.	Find hidden patterns & relationships.
Example Algorithms	Linear Regression, Decision Trees, Random Forest	K-Means, PCA, Clustering
Use Cases	Spam detection, fraud detection, loan approval, price prediction.	Customer segmentation, anomaly detection, topic modeling, recommendation systems.

Quiz 1

What is Machine Learning?

A. A programming technique that does not require data

A subset of AI that enables computers to learn from data

C. A hardware component for faster computing

D. A method to manually program all possible outcomes

Quiz 2

Which of the following is NOT a type of Machine Learning?

A. Supervised Learning

B. Unsupervised Learning

C. Reinforcement Learning

✅ Static Learning

Quiz 3

Which of the following is an example of supervised learning?

- ✅ Spam email classification
- B. Customer segmentation
- C. Market basket analysis
- D. Anomaly detection

Quiz 4

What is the key difference between supervised and unsupervised learning?

A. Supervised learning uses labeled data, while unsupervised learning uses unlabeled data

B. Unsupervised learning requires human intervention, while supervised learning does not

C. Both require labeled data

D. Supervised learning is used only for clustering

Quiz 5

Which of the following is an example of a regression problem?

A. Predicting whether an email is spam or not

✅ Predicting the price of a house based on its features

C. Identifying handwritten digits

D. Classifying animals into different species

Quiz 6

What is the primary goal of Unsupervised Learning?

- ✅ To find patterns in data without predefined labels
- B. To predict continuous values
- C. To classify data into known categories
- D. To memorize data points

Summary

What is ML?

- ➔ Simple Meaning
- ➔ Real world examples

Types of ML

- ➔ Supervised Learning
  - Regression
  - Classification
- ➔ Un-Supervised Learning
  - Clustering
  - Dimensionality Reduction