Machine Learning : ability of machine to learn from the past data, understand & process in order to give some output/outcome without or with minimal human intervention.

Type of ML :

- Supervised ML → label, known i/p and o/p
  - Regression (prediction)
    - Linear Regression (straight line)
      - Simple Linear Regression
      - Multiple Linear Regression
    - Non-linear Regression (curvy line)
      - Polynomial Regression
  - Classification (to classify)
    - Logistic Regression (Sigmoid)
    - Support Vector Machine (SVM) (hyperplane)
    - kNearest Neighbour (kNN) (distance metrics)
    - Naive Bayes (Probability)
    - Decision Tree (Tree)
    - Random Forest (Ensemble Learning)
- Unsupervised
  - Clustering (group)
    - kMeans
    - kMeloid
    - CLARA
    - DBSCAN
    - Hierarchical clustering
    - Gaussian Mixture Model
  - Dimension Reduction Technique (DRT)
    - Principal Component Analysis (PCA)
    - Singular Value Decomposition (SVD)
    - Linear Discriminant Analysis (LDA)
    - Autoencoders
    - t-SNE
  - Association Rule (Relations: A → B)
    - Market Basket Analysis (MBA)
    - Apriori Algorithm
    - Recency Frequency Monetary (RFM)

Machine Learning Life Cycle / Flowchart

1. Problem Statement : What / How to do.
2. Data Collection : On what data.
   - Primary Source → Direct data → survey
   - Secondary Source → Indirect data → database, datawarehouse
3. Data Preprocessing : how the data is
4. Data Wrangling : Process
   - Data Cleaning : missing, duplicate, outliers
   - Data Transformation : encoding, scaling

EDA

5. Exploratory Data Analysis (EDA)
6. Model Development : train test / choose Algorithm
   - Performance Measure
   - Evaluation Metrics
   - Tuning
7. Model Deployment
   - System
   - Localhost
   - cloud.
8. Maintenance : Updating or Upgrading