

# 15 models of machine learning:

## 1. Linear Regression:

A simple algorithm used for predicting a continuous target variable based on one or more input features. It assumes a linear relationship between inputs and the target.

## 2. Logistic Regression:

A classification algorithm used for binary or multiclass classification problems. It uses a logistic function to model the probability of a class label.

## 3. Decision Tree:

A tree-like structure where each internal node represents a feature, and branches represent the target values.

or classification. It's easy to interpret but prone to overfitting.

#### 4. Random Forest:

An ensemble method that creates multiple decision trees and aggregates their results (e.g., by majority voting for classification or averaging for regression) to improve accuracy and reduce overfitting.

#### 5. Support Vector Machine: (SVM)

A supervised learning model used for classification and regression tasks. It works by finding the optimal hyperplane that separate different classes in the feature space.

#### 6. K-Nearest Neighbors ; (KNN)

A non-parametric classification and regression algorithm that assigns

Labels based on the majority class or average of the nearest data points in the feature space.

## 7. Naive Bayes:

Based on Bayes' theorem, it assumes independence between features. It is particularly effective for text classification problems (e.g., spam detection) and works well even with small data.

## 8. K-Means Clustering:

A clustering algorithm that partitions data into  $K$  clusters by minimizing the variance within each cluster. It's a common method for grouping data into distinct categories.

## 9. Hierarchical Clustering:

Builds a hierarchy of clusters by either iteratively merging smaller clusters or splitting larger ones. It is useful for understanding data structure and relationships.

## 10. Principal Component Analysis (PCA):

PCA reduces the dimensionality of large datasets while preserving most of the variance. It projects data into lower-dimensional space, often for visualization or noise reduction.

## 11. Gradient Boosting Machine (GBM):

An ensemble technique that builds models

sequentially. Each new model corrects the errors made by the previous ones. It's a powerful method for structured/ tabular data.

### 12. XGBoost:

A highly optimized implementation of gradient boosting. Known for its speed and performance, XGBoost is widely used in machine learning competitions.

### 13. AdaBoost:

Another boosting algorithm that combines multiple weak learners to create a strong classifier. The key idea is to focus more on misclassified examples.

## 14. Neural Networks ANN:

Neural networks consist of layers of interconnected nodes (neurons) that simulate the way the human brain works. They are highly flexible and can model complex patterns in both classification and regression tasks.

## 15. Convolutional Neural Network (CNN):

A specialized type of neural network primarily used for image data. CNN use convolutional layers to automatically detect features from raw images, making them very effective in computer vision tasks.