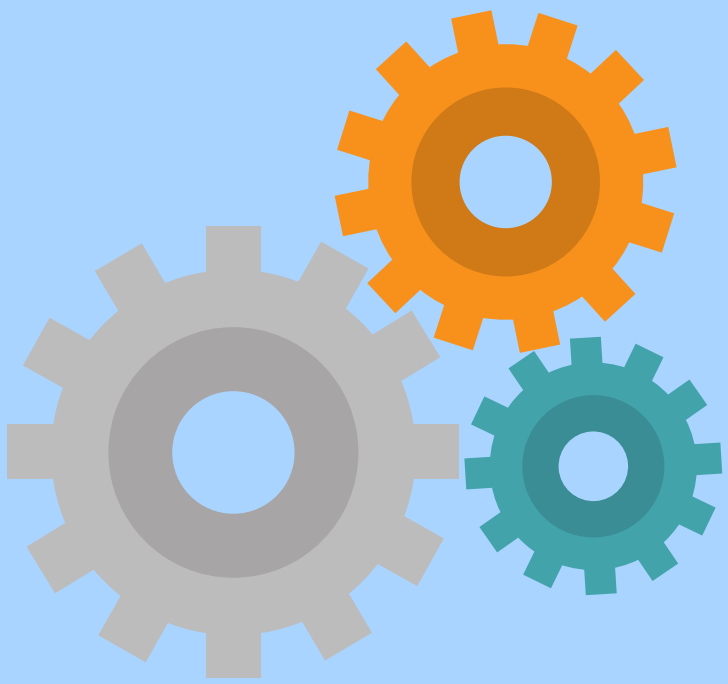
Machine Learning Algorithms



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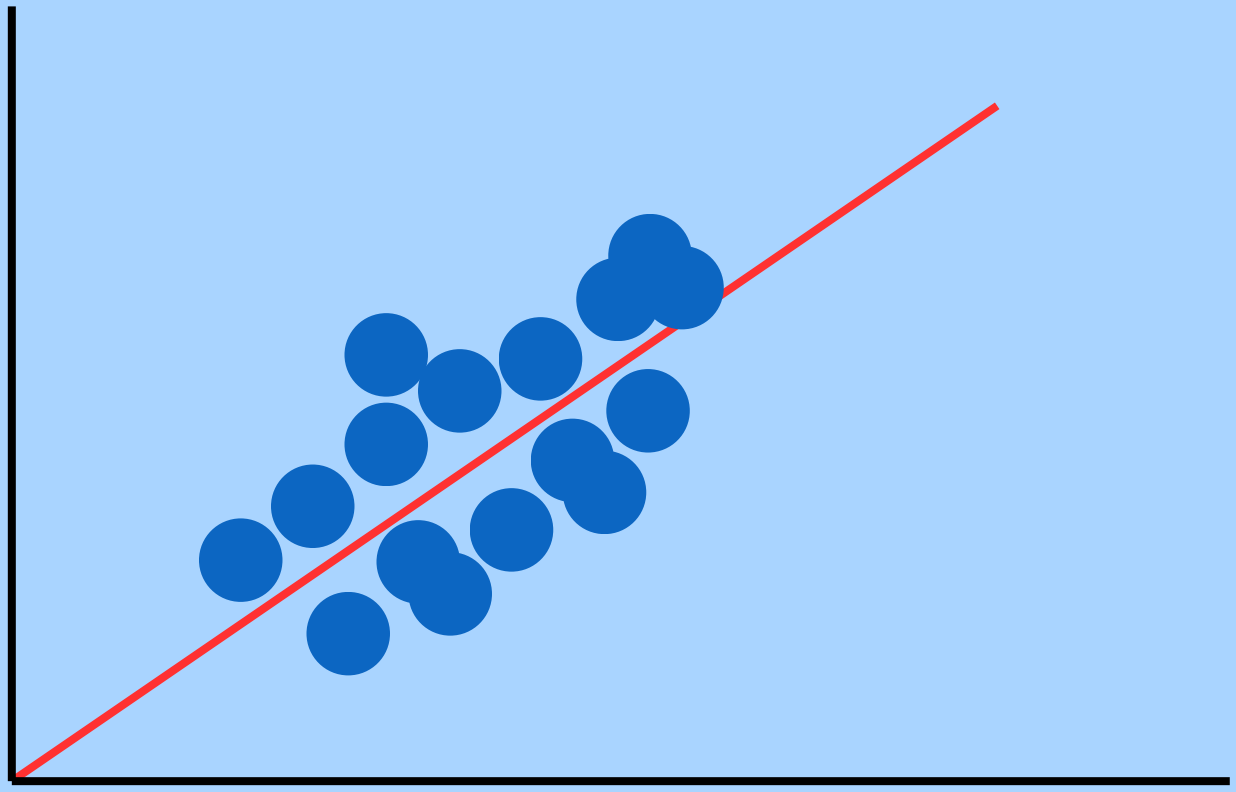
Linear Regression



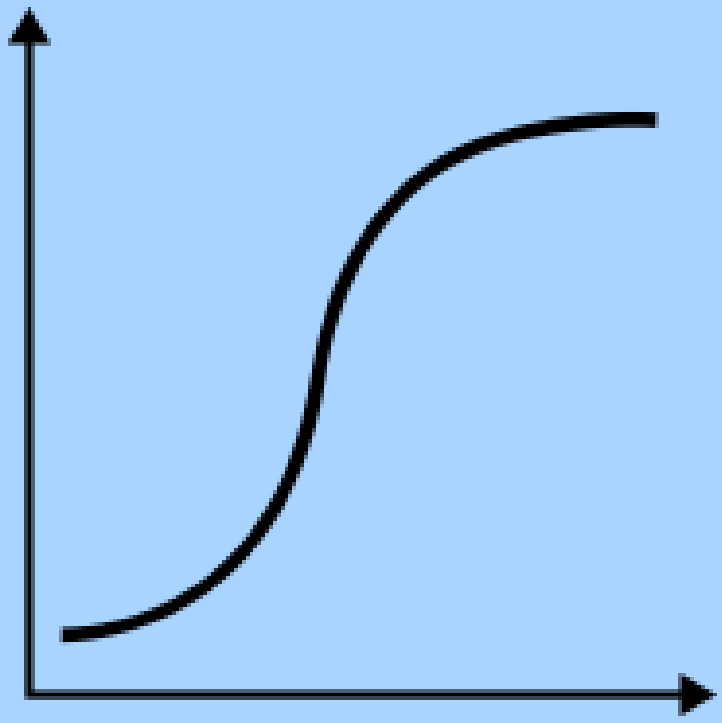
Type: Supervised Learning algorithm (Regression task).

- **Purpose**: Predicts a continuous output (e.g., house prices, temperatures, sales).
- **How It Works:** Finds the best-fit straight line (y = mx + c) that minimizes the error between predicted and actual values.

Use Cases:

Predicting stock prices.
Estimating home values.
Forecasting sales or demand.

Logistic Regression



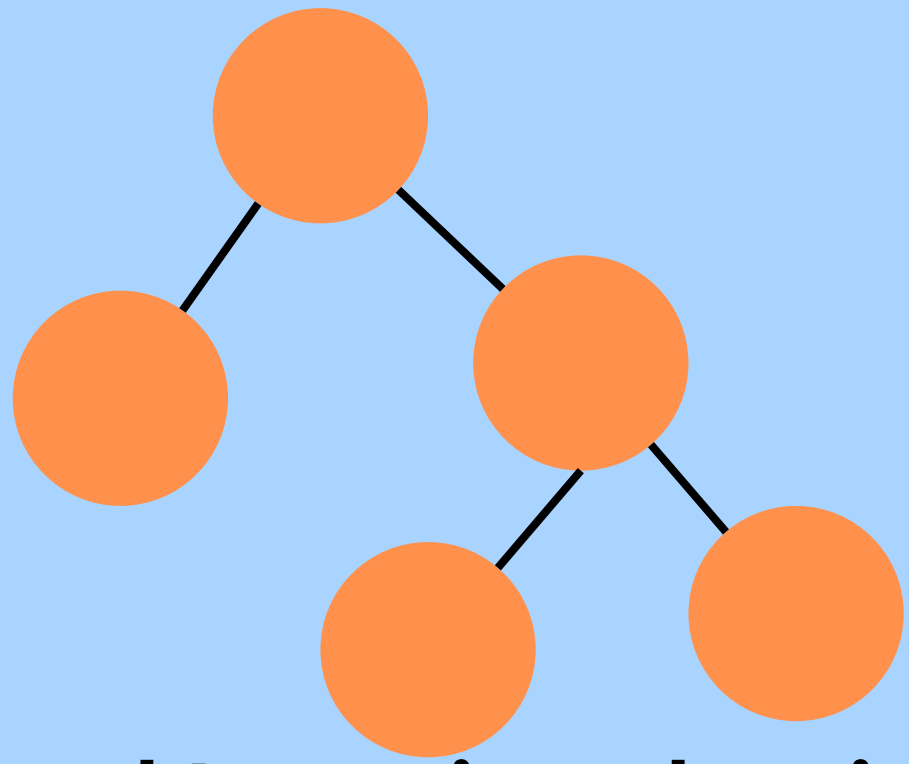
Type: Supervised Learning algorithm (Classification task).

- **Purpose:** Predicts a categorical outcome (e.g., yes/no, spam/not spam, 0/1).
- **How It Works:**Uses the logistic function (sigmoid) to output probabilities.Probabilities are then converted into binary or multi-class labels.

Use Cases:

Email spam detection.
Fraud detection.
Predicting customer churn.

Decision Trees



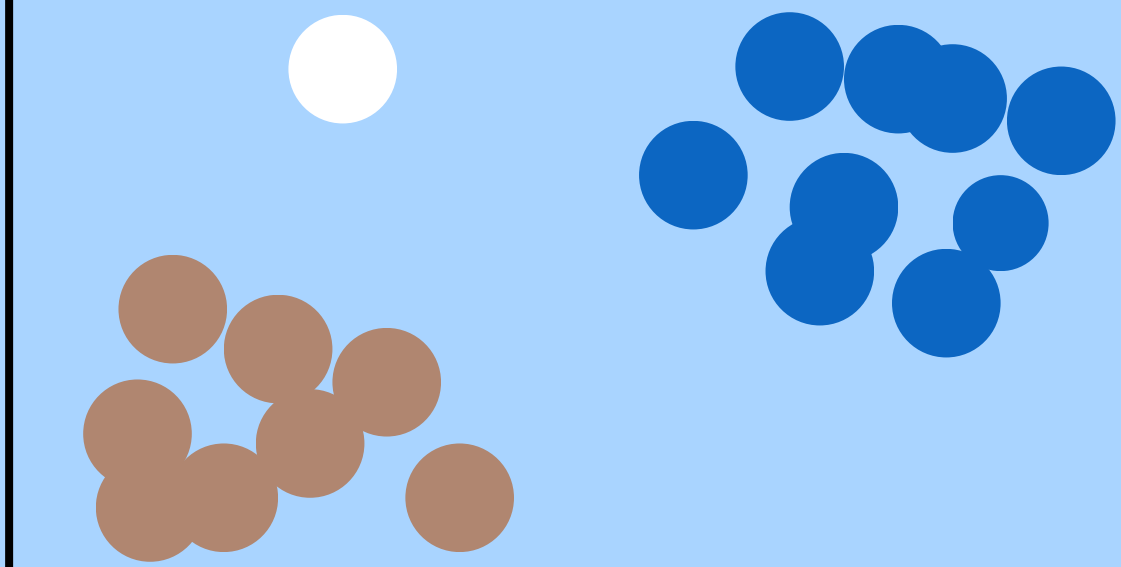
Type: Supervised Learning algorithm (Classification and Regression tasks).

- **Purpose**: Makes predictions by splitting the data into subsets based on feature values, forming a tree structure.
- **How It Works:**At each node, the algorithm selects the feature that best splits the data based on a metric (e.g., Gini Index, Entropy).The tree continues splitting until a stopping condition is met (e.g., max depth or pure leaf nodes).

Use Cases:

Loan approval decisions.
Customer segmentation.
Fraud detection.

K-Nearest Neighbors



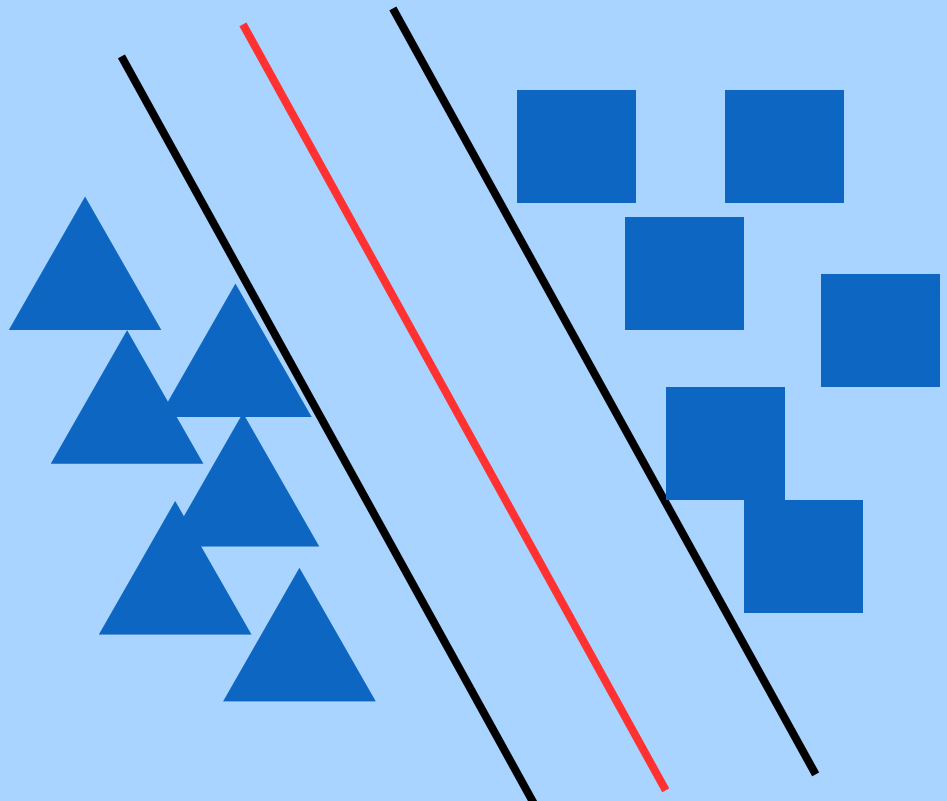
Type: Supervised Learning algorithm (Classification and Regression tasks).

- **Purpose**: Predicts the class or value of a data point based on the majority class (or average) of its nearest neighbors.
- **How It Works:** Calculates the distance (e.g., Euclidean) between the target point and all other points.Selects the k nearest neighbors and determines the majority class or average value.

Use Cases:

Handwriting recognition.
Recommendation systems.
Predicting diseases based on patient symptoms.

Support Vector Machine



Type: Supervised Learning algorithm (Classification and Regression tasks).

- **Purpose**: Finds the best hyperplane that separates data points into distinct classes with maximum margin.
- **How It Works:**:Maps data into higher dimensions using kernels.Maximizes the margin between classes and uses support vectors (critical points) to define the boundary.

Use Cases:

Image classification.
Text categorization.
Bioinformatics

What if you could combine the power of multiple models to make even smarter predictions? 🤔"

👉 Stay tuned for my next post on Ensemble Techniques, featuring algorithms like AdaBoost, Random Forest, and more!

💡 Follow me to learn how to boost your ML skills! 🚀

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