



1. **Linear Models:**
 - **Linear Regression:** Used for regression tasks where the relationship between features and the target variable is assumed to be linear.
 - **Logistic Regression:** Applied to binary classification problems.
2. **Tree-Based Models:**
 - **Decision Trees:** Simple tree structures for classification and regression.
 - **Random Forest:** An ensemble of decision trees for improved performance and robustness.
 - **Gradient Boosting:** Boosting algorithm that builds trees sequentially, each correcting errors of the previous ones (e.g., XGBoost, LightGBM).
3. **Support Vector Machines (SVM):**
 - Effective for both classification and regression tasks, particularly in high-dimensional spaces.
4. **Neural Networks:**
 - **Feedforward Neural Networks:** Basic neural network architecture for various tasks.
 - **Convolutional Neural Networks (CNN):** Specialized for image-related tasks.
 - **Recurrent Neural Networks (RNN):** Suitable for sequential data (e.g., time series, natural language).
 - **Transformers:** Effective for sequence-to-sequence tasks, such as language translation (e.g., BERT, GPT).
5. **Instance-Based Models:**
 - **k-Nearest Neighbors (k-NN):** Classifies new instances based on their similarity to existing instances.
6. **Clustering Models:**
 - **K-Means:** Used for clustering similar data points.
 - **Hierarchical Clustering:** Organizes data points into a hierarchy of clusters.
7. **Ensemble Models:**
 - **Voting Classifiers/Regressors:** Combine multiple models to improve overall performance.
 - **Stacking:** Combines multiple models using a meta-model.
8. **Dimensionality Reduction Models:**
 - **Principal Component Analysis (PCA):** Reduces the dimensionality of the data while retaining important information.
9. **Probabilistic Models:**
 - **Naive Bayes:** Based on Bayes' theorem and suitable for classification tasks.
 - **Gaussian Mixture Models (GMM):** Used for density estimation and clustering.
10. **Time Series Models:**
 - **ARIMA (AutoRegressive Integrated Moving Average):** For time series forecasting.
 - **LSTM (Long Short-Term Memory):** A type of recurrent neural network suitable for sequential data.
11. **Reinforcement Learning Models:**
 - **Q-Learning, Deep Q Networks (DQN):** Used in scenarios where agents learn to make decisions by interacting with an environment.
12. **Transfer Learning Models:**
 - Use pre-trained models and fine-tune them for specific tasks, saving training time and resources.
13. **Anomaly Detection Models:**
 - **Isolation Forest, One-Class SVM:** Detect anomalies or outliers in the data.