STOCK PRICE PREDICTOR

GROUP MEMBERS:
ABDULLAH TANWEER (23SP-005-SE)
TAHA IMRAN (23SP-022-SE)
MUHAMMAD ADEEL (23SP-014-SE)

AI Stock Predictor Model Report: Apple Inc. (AAPL)

1. Problem Statement:

Stock market prediction has long been a domain of interest for financial analysts and investors. With the rise of machine learning and AI, predictive models can now process large volumes of financial data to detect patterns, forecast trends, and support investment decisions.

This project aims to develop an AI-powered model to predict **Apple Inc. (AAPL)** stock prices using historical data. Apple is one of the most valuable and actively traded stocks, making it an ideal candidate for modeling and analysis.

Objectives:

- Predict future stock prices of Apple Inc.

- Compare multiple machine learning algorithms for prediction performance.

- Evaluate which model provides the most reliable forecast for investment purposes.

2. Dataset Details

Source:
https://www.investing.com/equities/apple-computer-inc-historical-data
Ticker: AAPL

Data Fields:

- Date
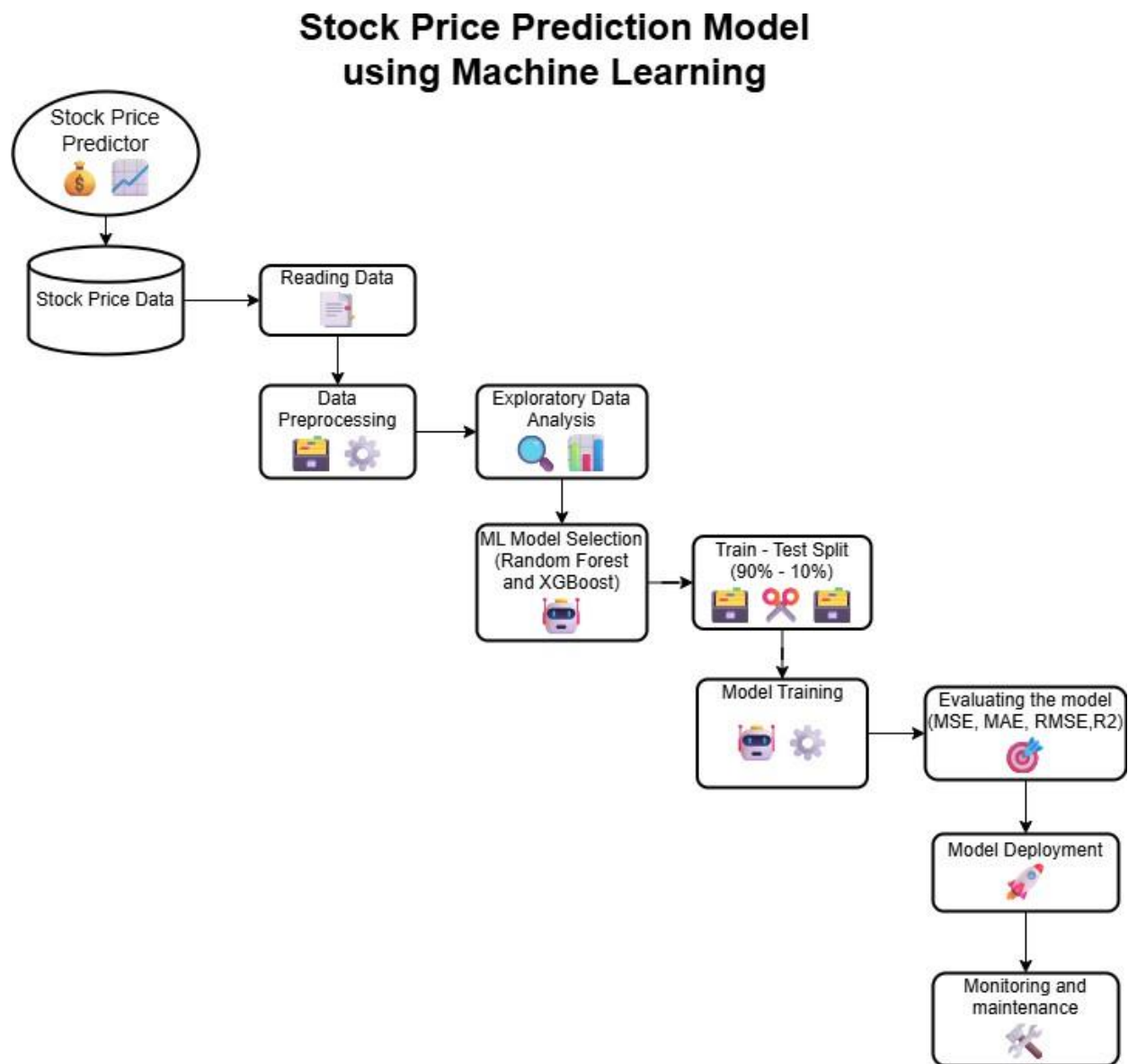
- Open Price

- High Price

- Low Price

- Close Price

Date Range: January 2021 – Dec 2024
Frequency: Daily

Preprocessing Steps:

- Split into training (90%) and testing (10%) datasets.

3. Methodology Diagram

Stock Price Prediction Model using Machine Learning

4. Results

Algorithms Used & Evaluation Metrics

Algorithm	R² Score (%)	MSE	MAE	Accuracy
Linear Regression	0.726	17.43	2.84	72%
Decision Tree Regressor	0.801	15.87	2.15	80%
Random Forest Regressor	0.949	14.64	2.46	94.9%
XGBoost Regressor	0.951	14.0	2.55	95.1%

5. Evaluation Methods

- **R² Score (Coefficient of Determination):** Indicates how well the model explains variance in stock prices.

- **Mean Squared Error (MSE):** Measures average squared difference between predicted and actual values.

- **Mean Absolute Error (MAE):** Measures average magnitude of errors in predictions.

- **Root Mean Squared Error (RMSE):** Measures the average magnitude of the errors made by a model