Stock Price Prediction Project Documentation

Problem Statement

The stock price prediction project aims to build a machine learning model that predicts the stock prices of Microsoft based on historical market data. The goal is to assist investors in making well-informed decisions and optimizing their investment strategies. The project involves data collection, data preprocessing, feature engineering, model selection, training, and evaluation.

Design Thinking

Data Collection:

Historical stock market data, including features like date, open price, close price, volume, and other relevant indicators, was collected from the provided dataset.

Data Preprocessing:

Data was cleaned, missing values were handled, and categorical features were converted into numerical representations to prepare the data for modeling.v

Feature Engineering:

Additional features were created to enhance the predictive power of the model, including lagged variables, moving averages, and technical indicators.

Model Selection:

The Random Forest Regressor was chosen as the model for predicting stock prices based on dataset characteristics.

Model Training:

The model was trained using the preprocessed data, and hyperparameters were fine-tuned for optimal performance.

Evaluation:

The model's performance was assessed using regression metrics, including Mean Absolute Error, Mean Squared Error, and R-squared.

Dataset

The project utilized the "Microsoft Lifetime Stocks Dataset" from Kaggle, which contains historical stock market data for Microsoft.

Key Findings and Insights

The stock price prediction model demonstrated promising results with low Mean Absolute Error (MAE) and Mean Squared Error (MSE), indicating its ability to accurately predict Microsoft's stock prices based on historical data. The R-squared (R2) value suggests that the model explains a significant portion of the variance in stock prices.

Recommendations

Investors can utilize the trained model to gain insights into potential future price movements and make informed investment decisions.

Further refinement of the model could involve exploring more complex deep learning architectures, such as LSTM or CNN-LSTM, to capture intricate temporal patterns.

Ongoing monitoring of the model's performance and regular updates to the training data are essential to adapt to changing market conditions.

Conclusion:

In conclusion, the Stock Price Prediction project is a valuable tool for investors, providing insights into future price movements and guiding investment decisions. It highlights the power of data-driven modeling in the financial world and underscores the importance of continuous monitoring and adaptation to changing market conditions. This project represents an essential step toward optimizing investment strategies and achieving better-informed financial decisions.