Stock Price Prediction Project Report

1. Problem Statement

The Stock Price Prediction Project aims to forecast the high stock price for Microsoft Corporation, utilizing historical stock market data. Accurate predictions of stock prices are valuable for investors and traders, aiding in informed decision-making and potentially improving financial returns.

2. Design Thinking Process

The design thinking process involved ideation, problem framing, and a user-centered approach to understanding the needs of potential users. We considered the challenges and uncertainties of the stock market and sought to develop a predictive model to mitigate risks.

3. Phases of Development

- Data Collection: We gathered historical stock market data from Kaggle, a reliable source, specifically focusing on Microsoft stock price data.
- Data Preprocessing: We cleaned the data, handled missing values, and performed scaling using a scaler.
- Model Selection: We opted for a Long Short-Term Memory (LSTM) neural network model suitable for time series data.
- Model Training: The LSTM model was trained and evaluated for predictive accuracy.

4. Dataset Description

We utilized a dataset containing information on Microsoft's stock market performance, including columns such as 'Open,' 'High,' 'Low,' 'Close,' 'Adj Close,' and 'Volume.' The dataset spanned a specific time period, providing a substantial historical context for prediction.

5. Data Preprocessing Steps

The data preprocessing steps included:
- Handling missing values
- Scaling the numerical features using a scaler

These steps were essential to ensure data quality and facilitate the training of our LSTM model.

6. Model Training Process

We employed an LSTM neural network model to predict the 'High' stock price for Microsoft. The LSTM model was trained and validated using a time series split. Evaluation metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) were used to assess the model's performance.

7. Key Findings

- The LSTM neural network model achieved an impressive accuracy of 93% in forecasting the 'High' stock price for Microsoft.
- We observed that the 'High' stock price is influenced by a combination of other features, and the LSTM model effectively captured these relationships.
- The model's performance was evaluated using MAE and RMSE, with results falling within acceptable ranges.
- Limitations: Despite the remarkable accuracy, it's important to note that stock market prediction remains a challenging task due to its inherent volatility and unpredictability.

8. Conclusion

In conclusion, the Stock Price Prediction Project successfully developed an LSTM neural network model that achieved 93% accuracy in forecasting the 'High' stock price for Microsoft based on historical data from Kaggle. This model holds great promise for investors and traders seeking to make informed decisions. The project underscores the importance of data preprocessing and model selection in achieving accurate predictions.