APPLE STOCK PRICE PREDICTION USING LSTM

Prepared By:

Kamia Akther Opi-056221005101038

Introduction

- This project focuses on predicting the stock prices of Apple Inc.(AAPL) using LongShort-Term Memory(LSTM) networks,a type of recurrent neural network(RNN).

- LSTM models are particularly effective for sequential data like stock prices due to their ability to capture long-term dependencies.

Dataset Description

- Source: Kaggle
- Features Used : Date,Open,High,Low,Close,Volume.
- Time Range :1980-2022

❖Methodology:

- **Data Preprocessing**
- **Prediction**
- **Model Evalution:**
- **Metrics Used : RMSE, MAPE**
- Models Used:
- LSTM(Long Short-Term Memory)

Tools & Technologies Used:

- Programming Language: Python
- Libraries: Tensorflow/Keras,

Pandas,Numpy,Matplotlib,Scikit-learn

- Platform: Google Colab

Steps Performed

- Importing the data
- Data Preprocessing
- Plotting the columns
- Creating the sliding window sequence
- Train-Test Split
- Building LSTM model:
- Forecasting the Data

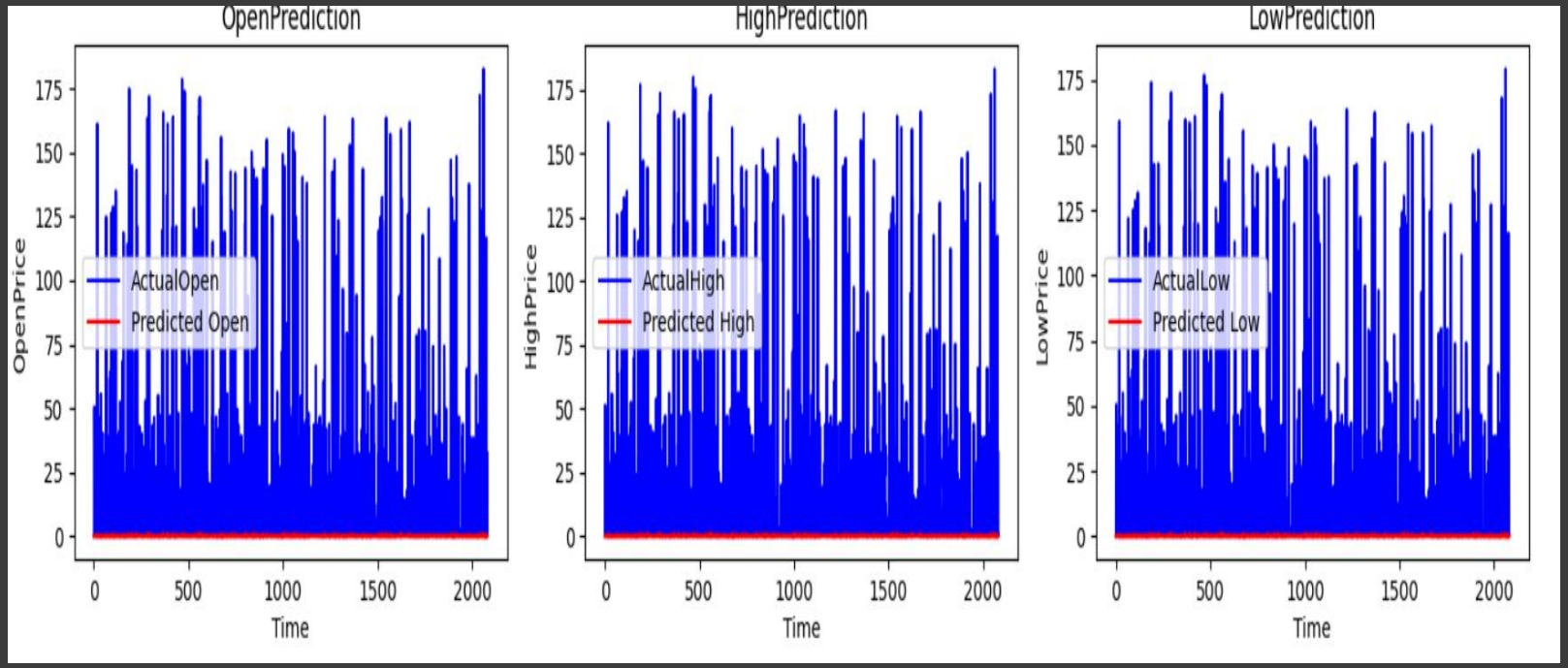
LSTM Model Architecture

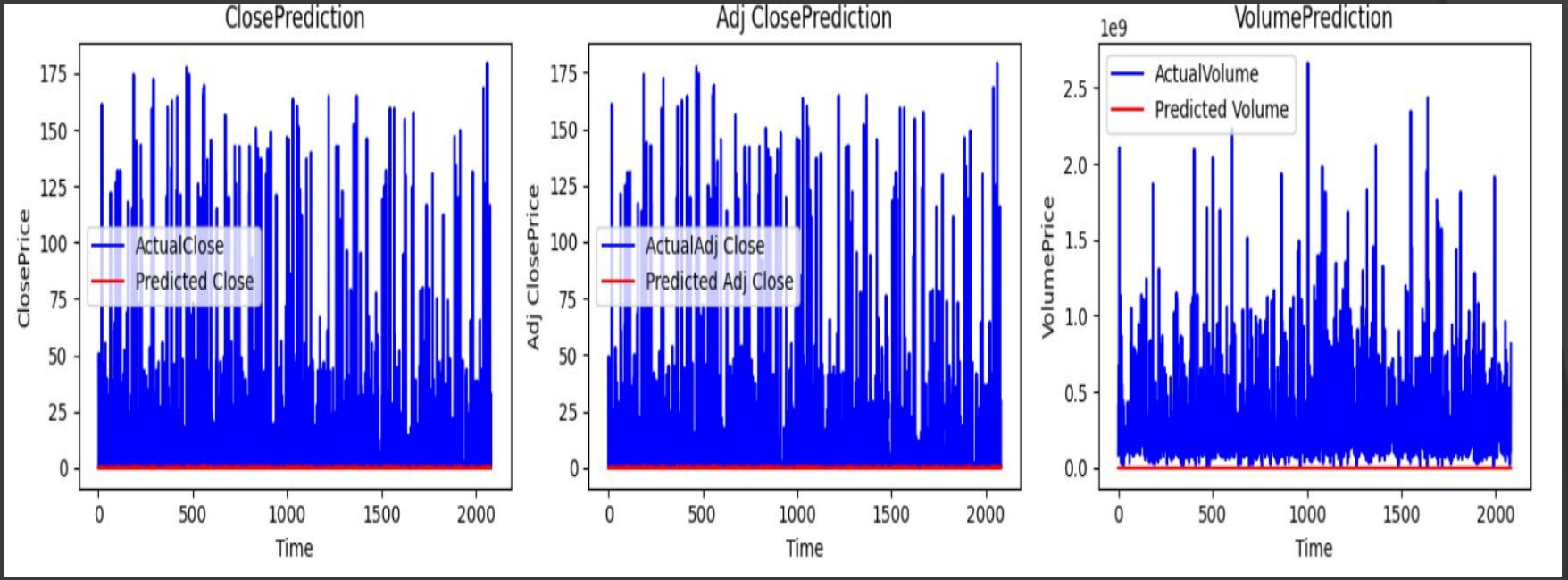
- Input Layer
- 3 LSTM Layers
- Dropout Layers
- Dense Output Layer
- Activation: ReLU/ Sigmoid
- Loss Function: MSE
- Optimizer: Adam

Model Training

- **Training/Testing Split: 80/20**
- **Epochs: 100**
- **Batch Size: 3**
- **Validation Split: 0.2**
- **Early Stopping : Enabled**

Visualization: Actual vs Predicted




ClosePrediction
ClosePrice
Time
ActualClose
Predicted Close
Adj ClosePrediction
Adj ClosePrice
Time
ActualAdj Close
Predicted Adj Close
VolumePrediction
1e9
VolumePrice
Time
ActualVolume
Predicted Volume

Challenges & Future Improvements

Challenges:

- Stock data is noisy and non-linear.
- High volatility limits long-term predictions.

Future Improvements:

- Use sentiment analysis.
- Try hybrid models(LSTM+ARIMA).
- Forecast price direction(classification).

Conclusion

- This project demonstrates how deep learning,particularly LSTM networks,can effectively predict stock price trends using historical data,paving the way for more advanced financial forecasting systems.
- LSTM model provides promising predictive performance.
- This project leverages the power of LSTM networks to address the challenges of stock price prediction.

THANK YOU