



SASTRA
ENGINEERING · MANAGEMENT · LAW · SCIENCES · HUMANITIES · EDUCATION
DEEMED TO BE UNIVERSITY
(U/S 3 of the UGC Act, 1956)



THINK MERIT | THINK TRANSPARENCY | THINK SASTRA

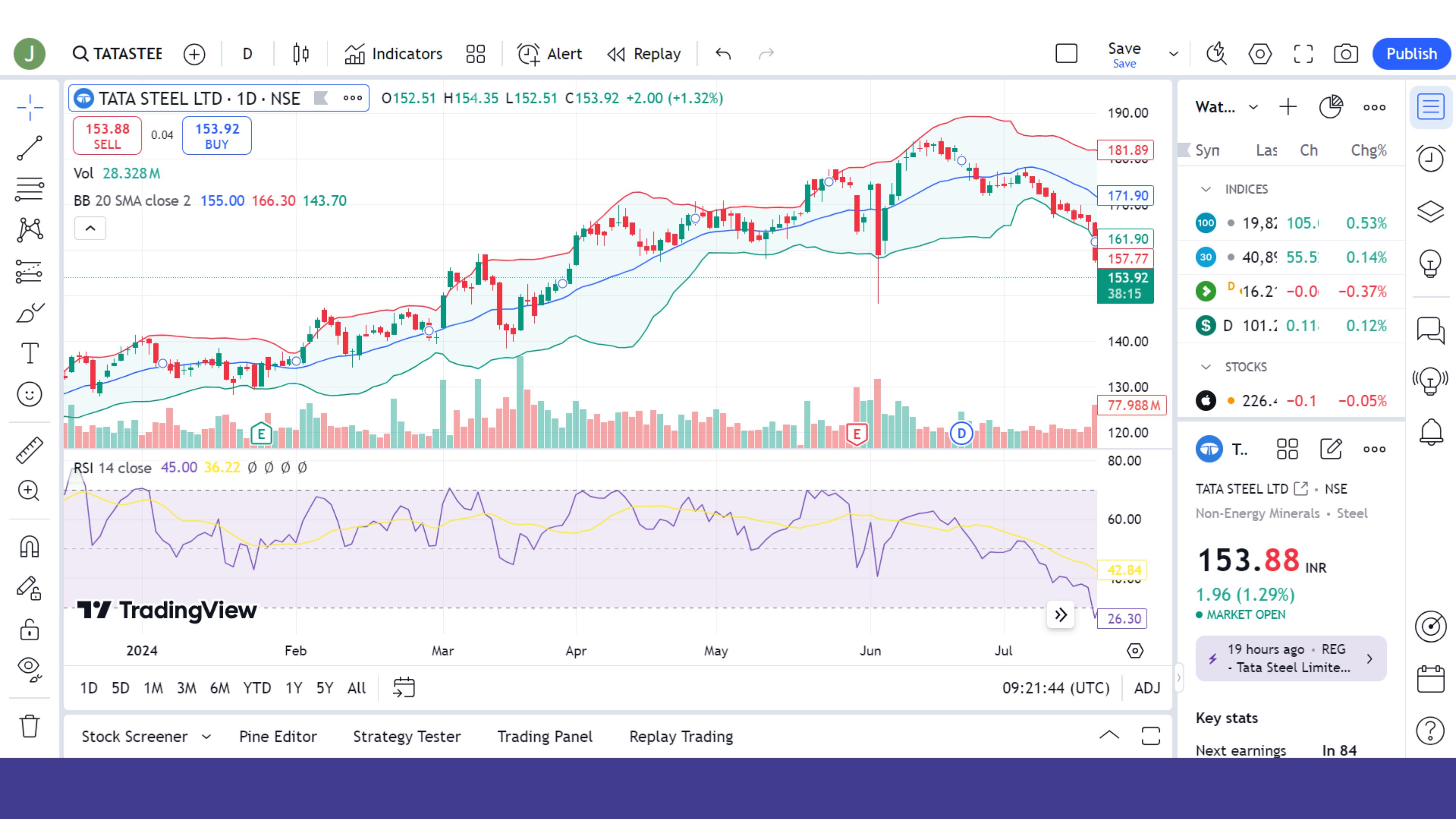
Machine Learning - Project Review

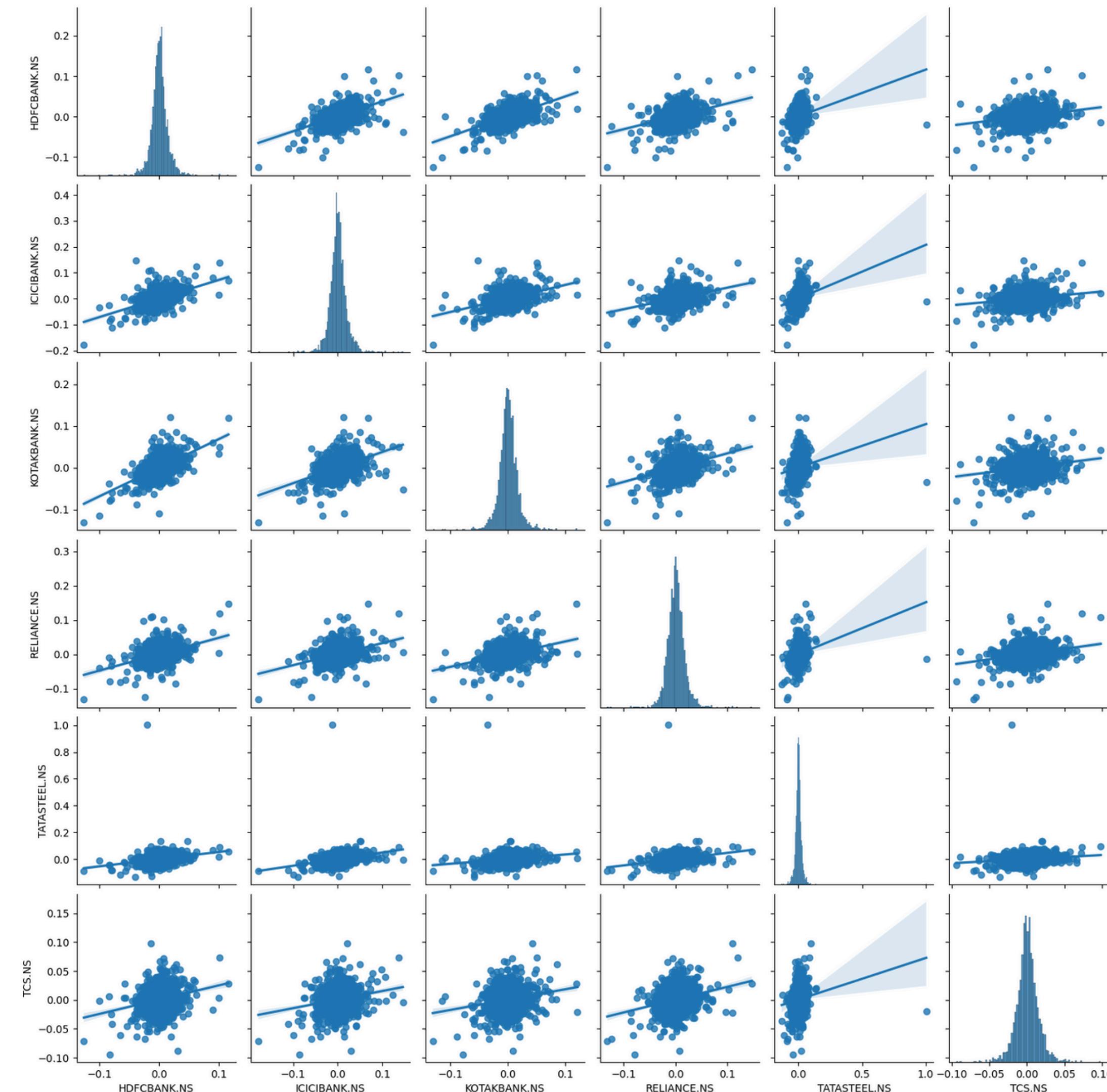
AI TradeMaster : Integrating AI and Sentiment Analysis for Trading

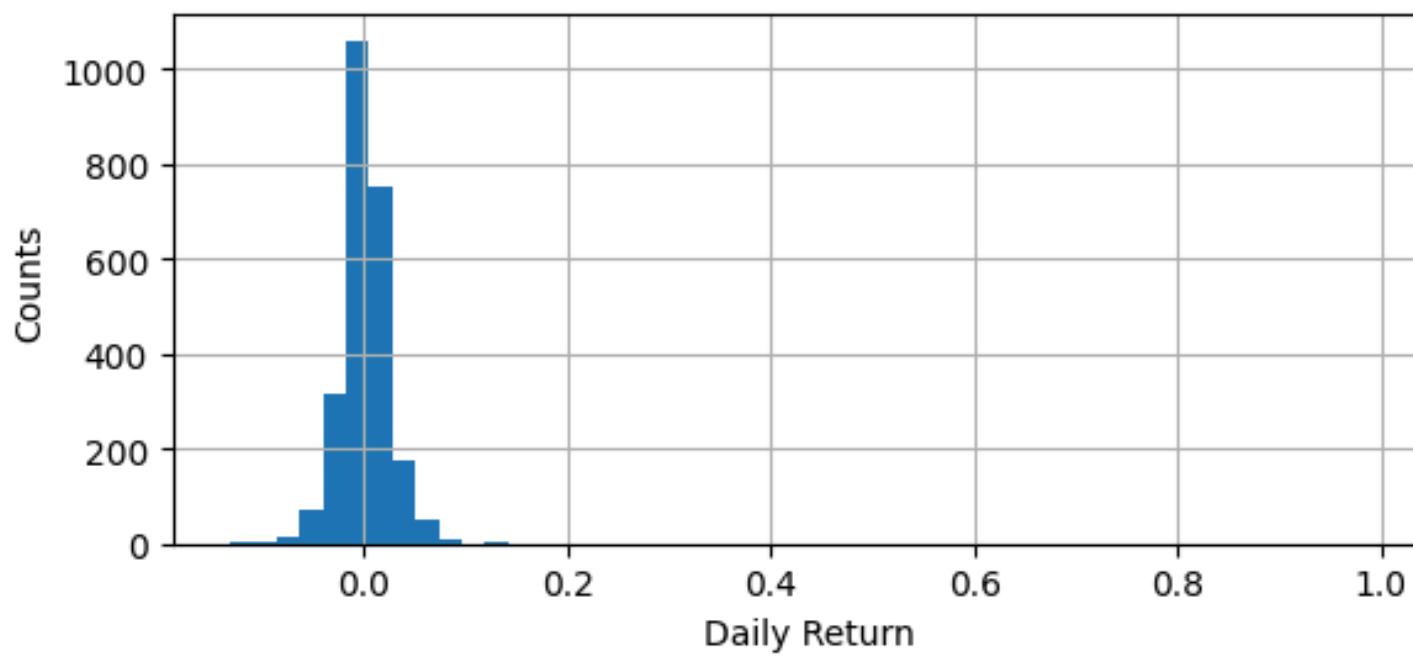
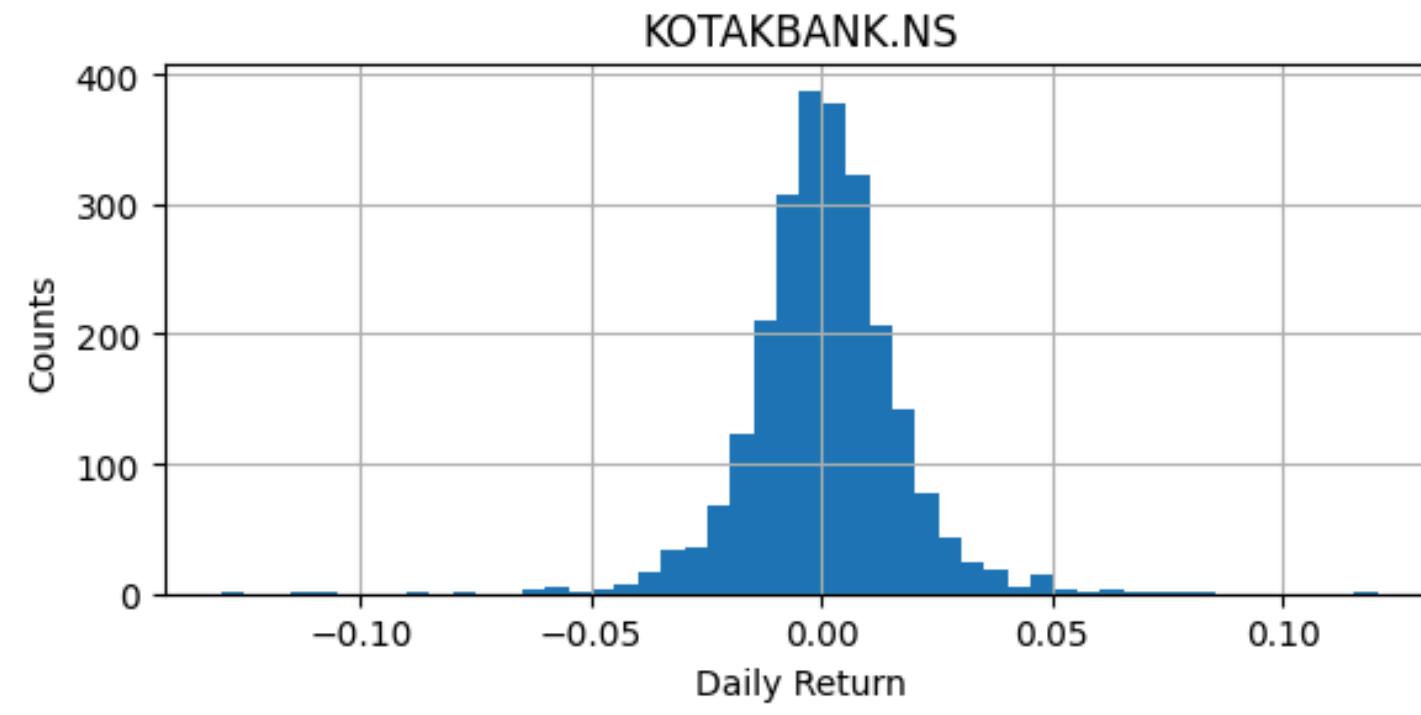
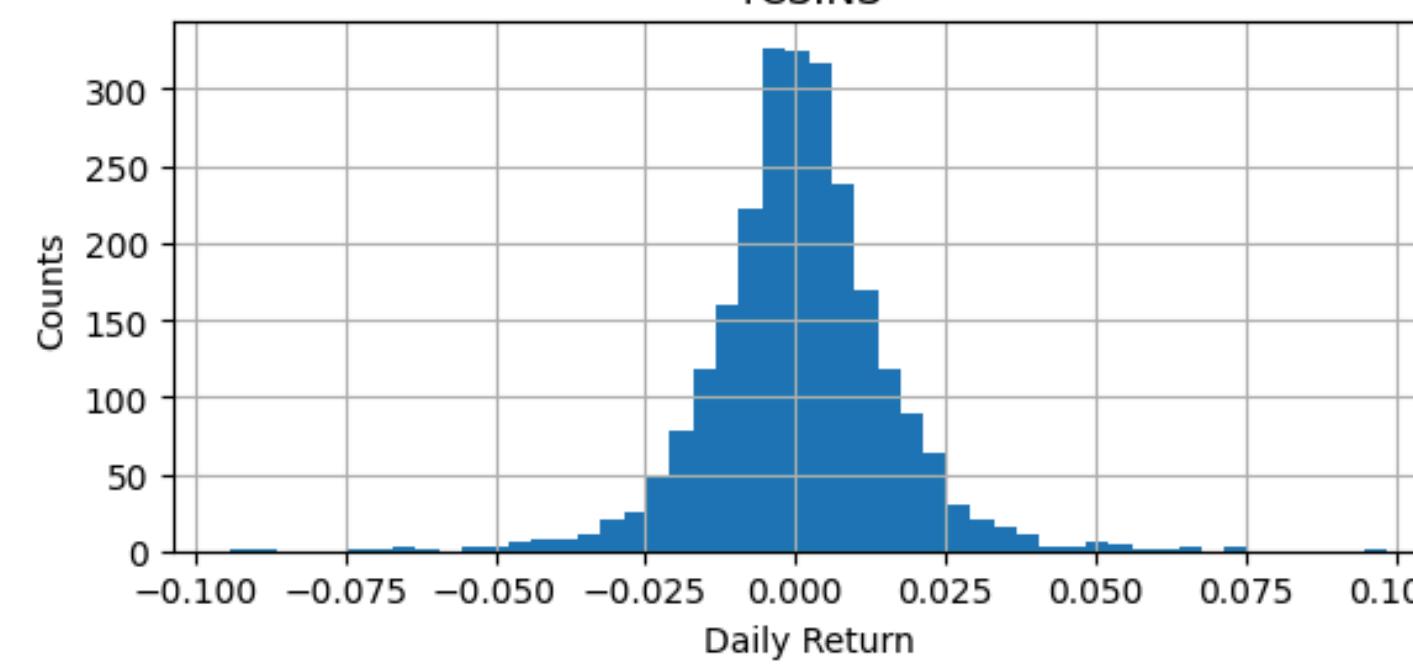
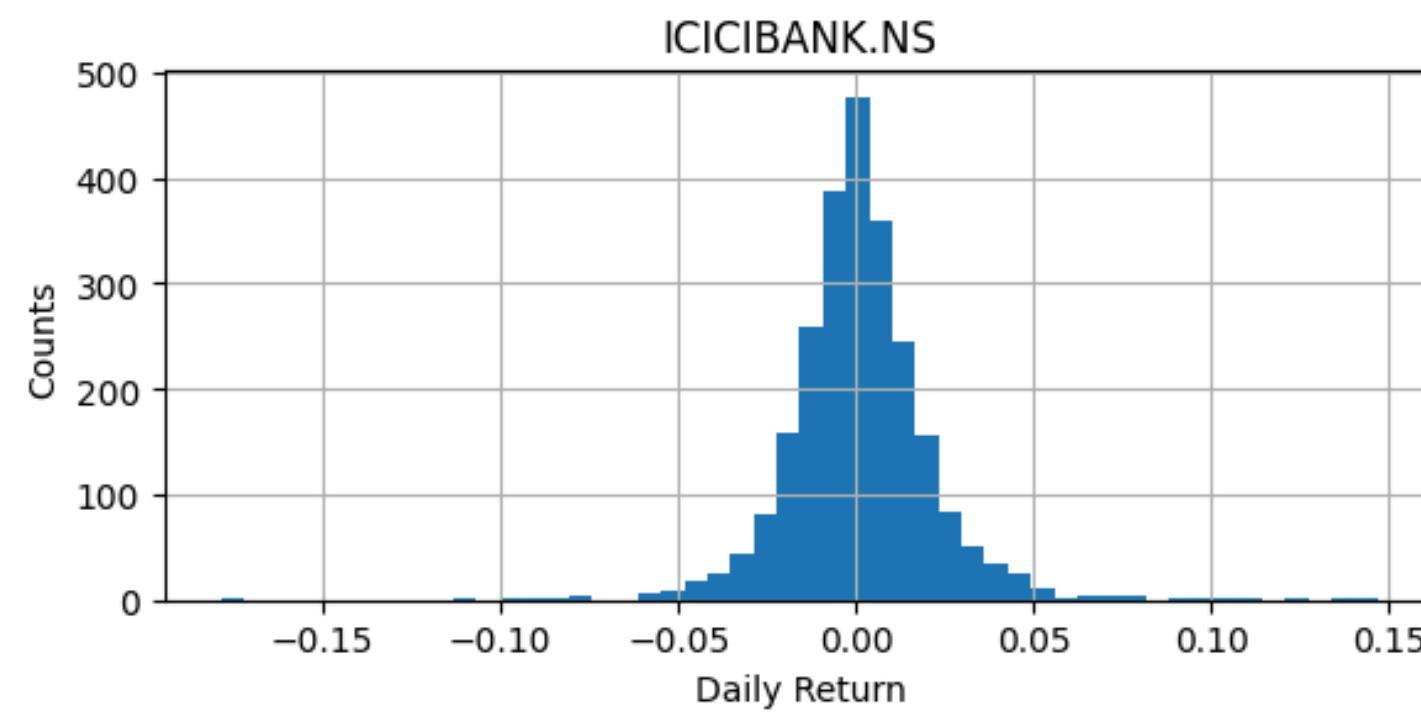
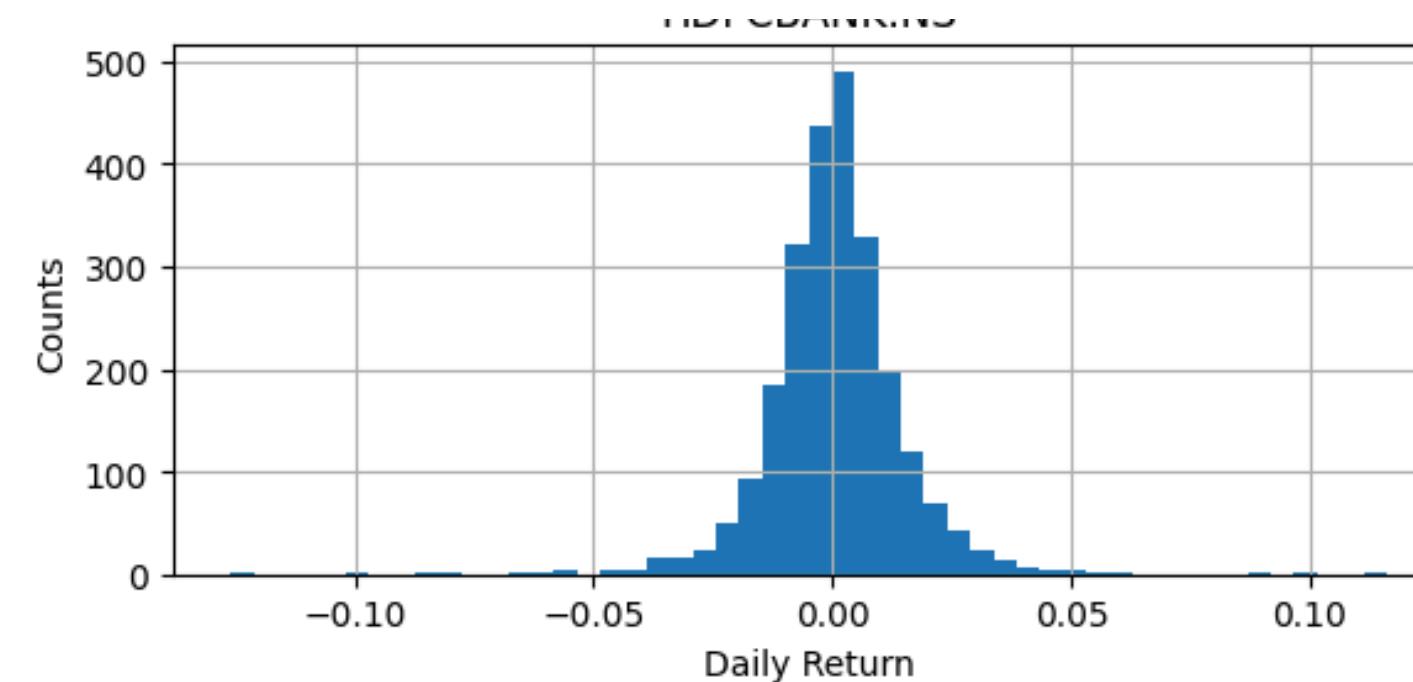
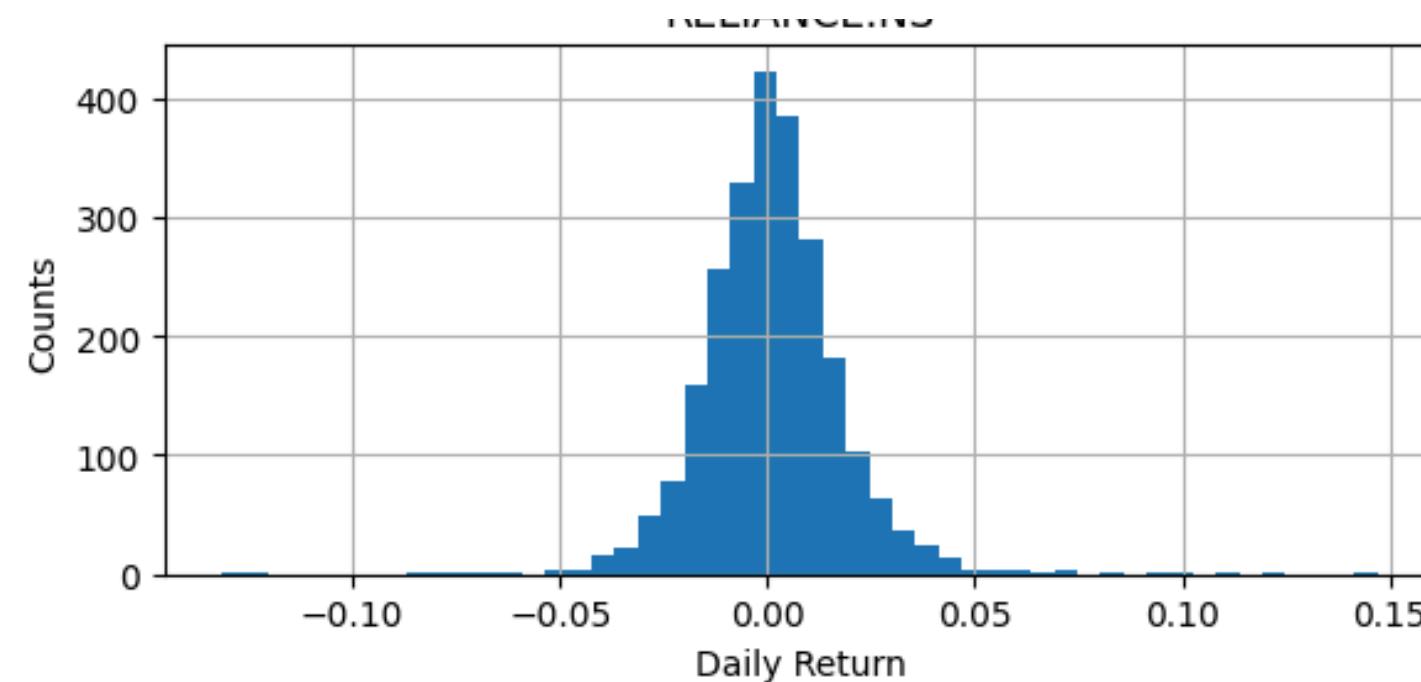
GUIDED BY: SWETHA VARADARAJAN

DONE BY

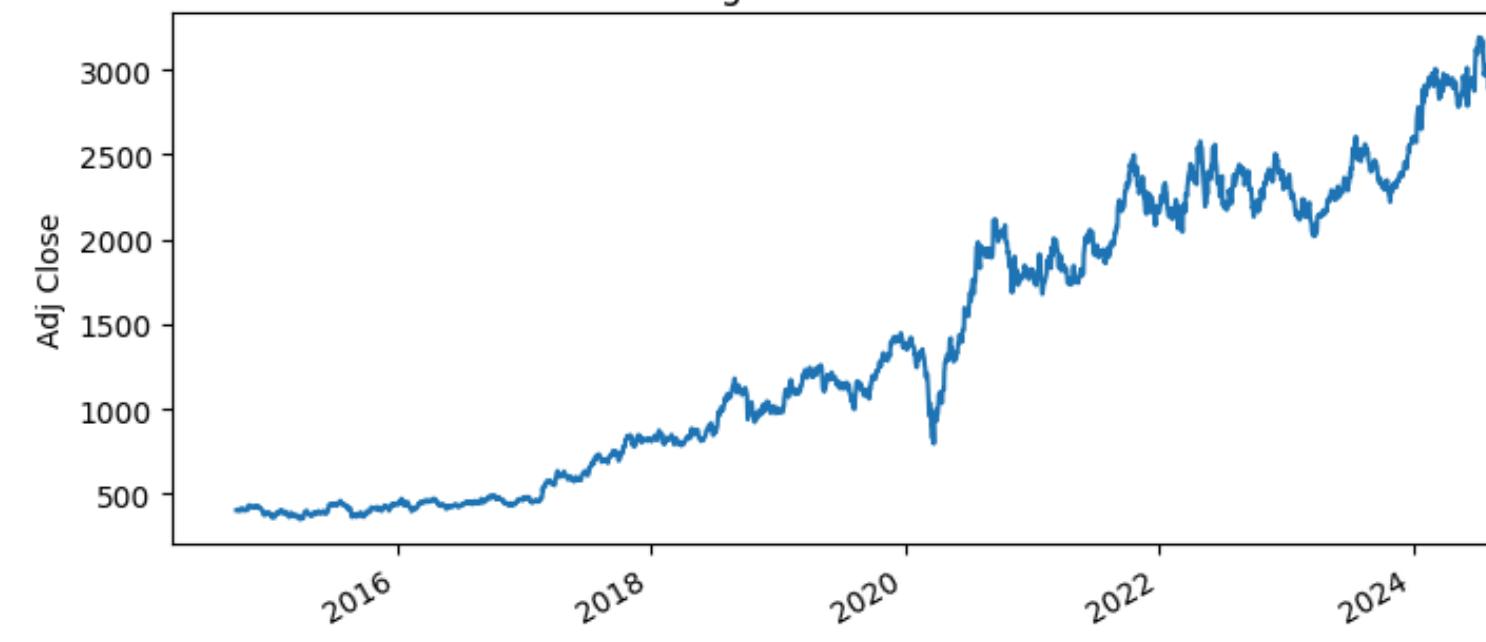
Ganesh Prasath A



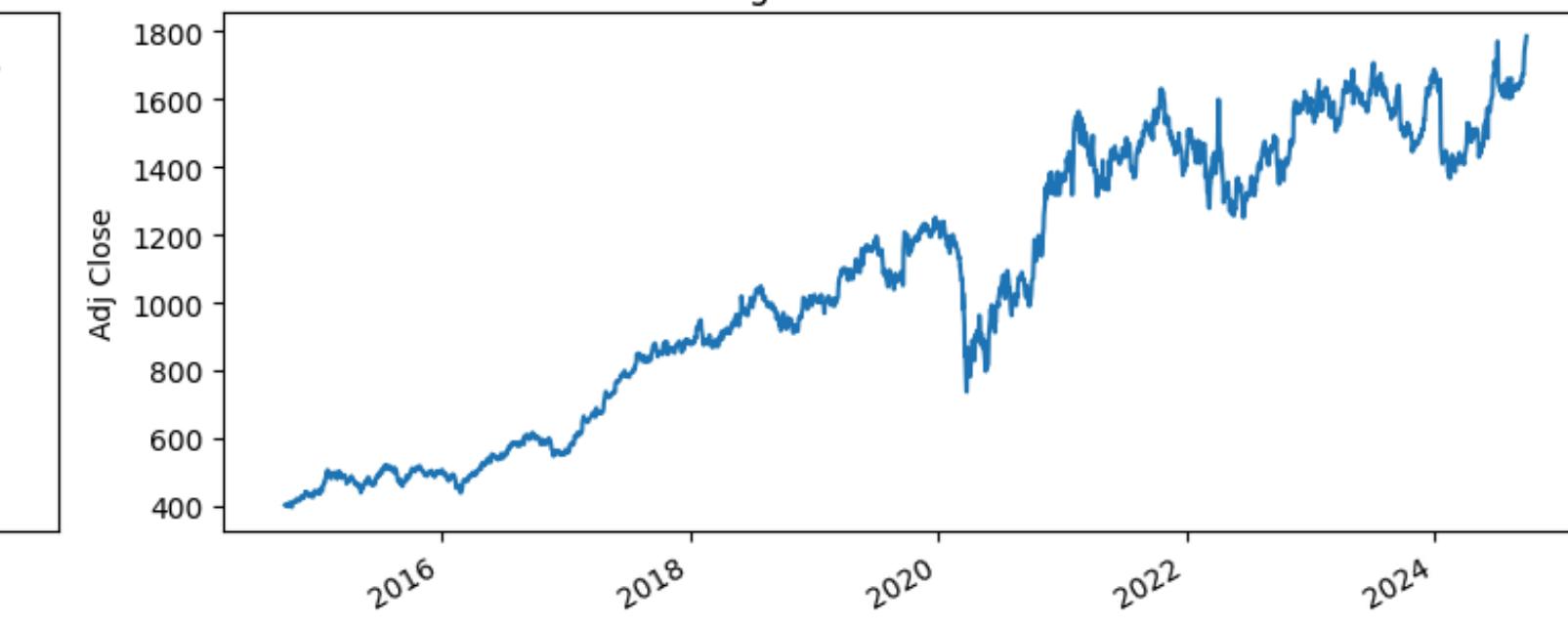




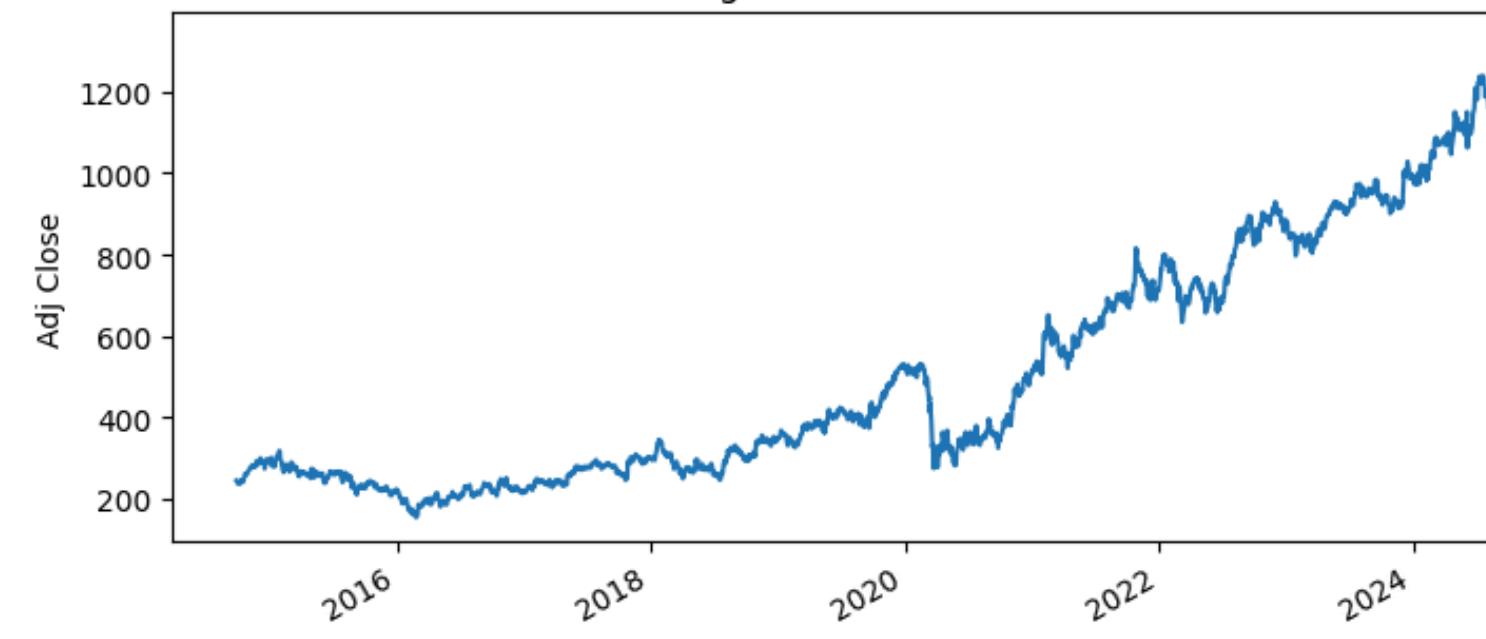
Closing Price of RELIANCE.NS



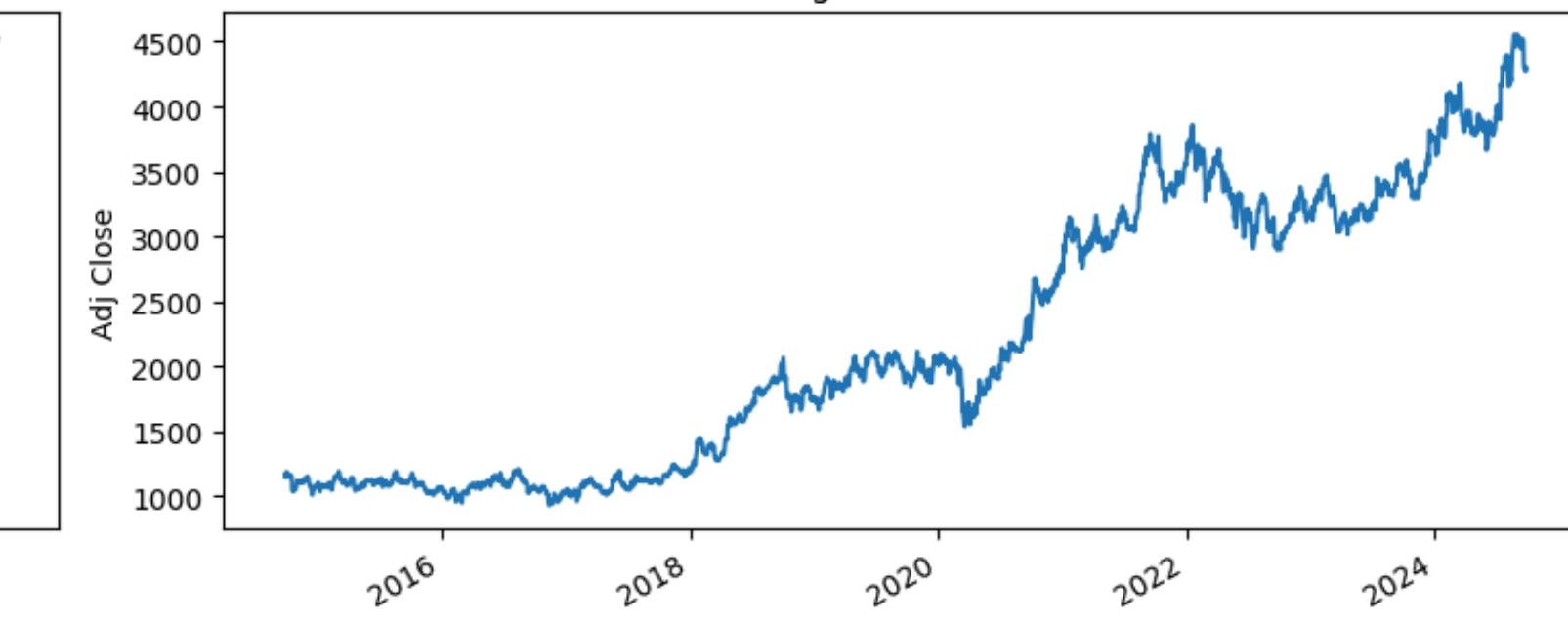
Closing Price of HDFCBANK.NS



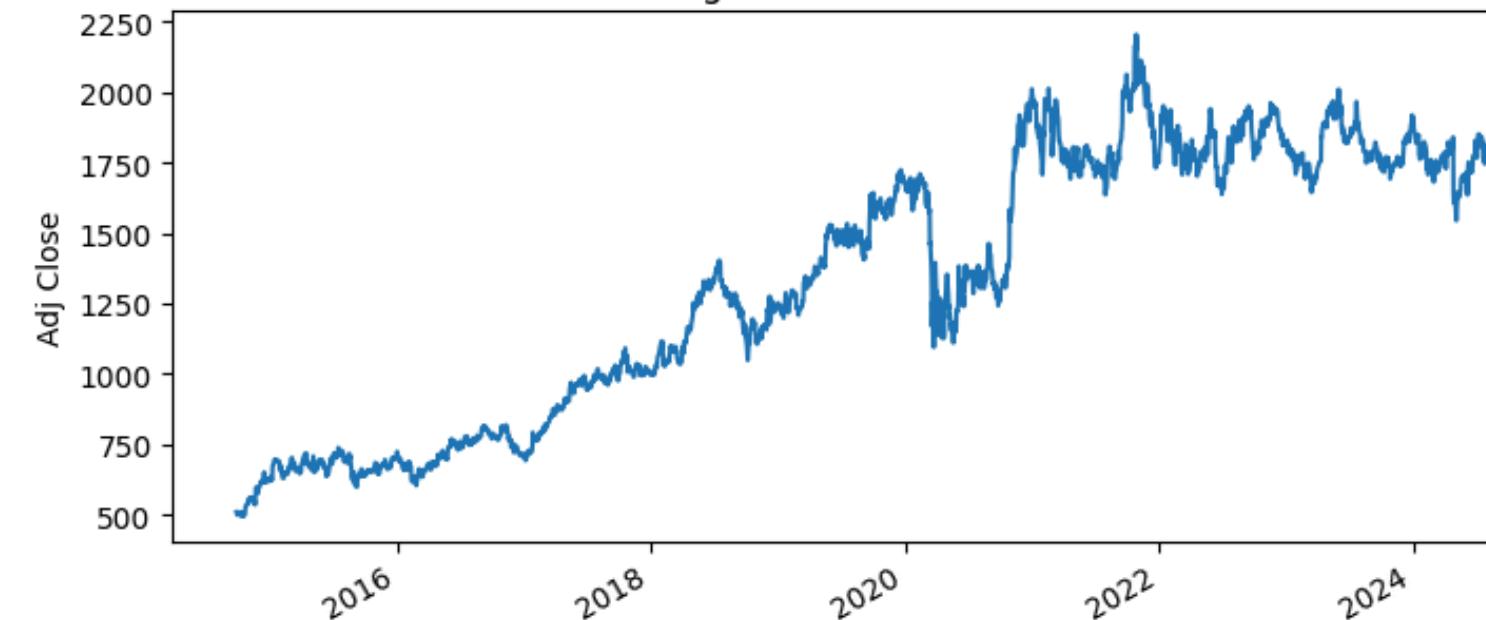
Closing Price of ICICIBANK.NS



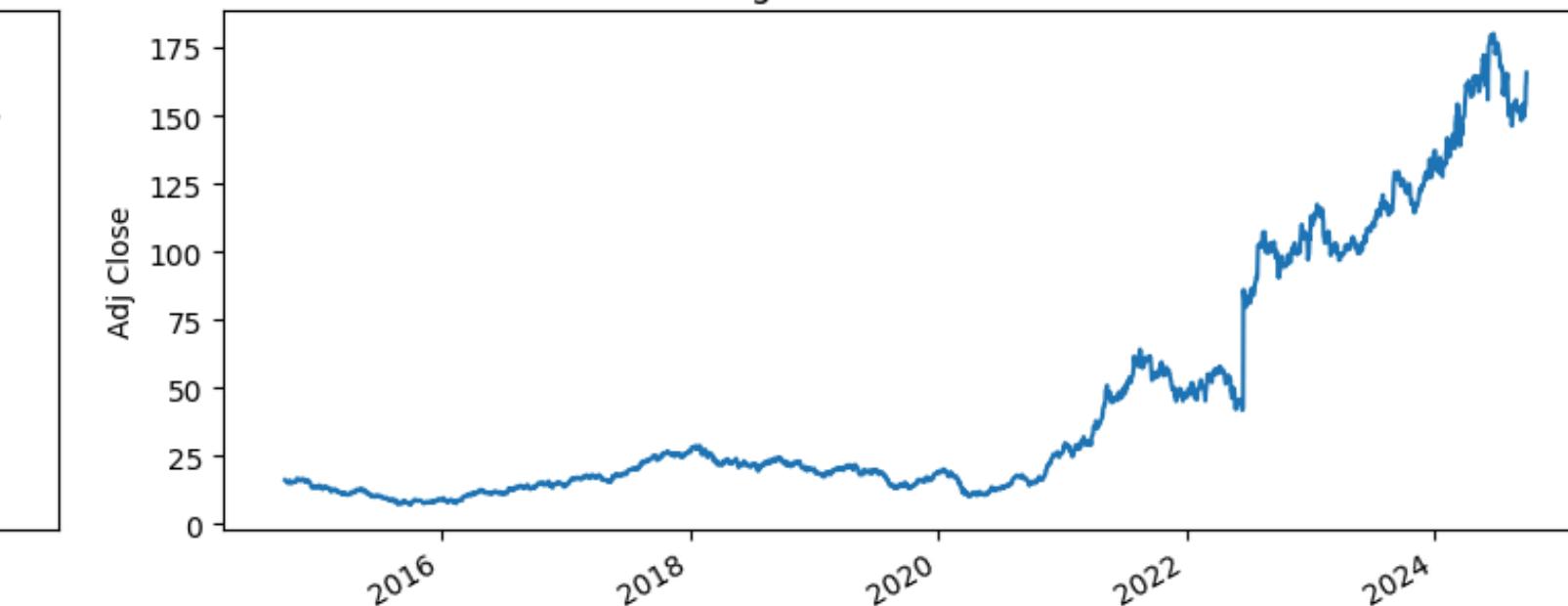
Closing Price of TCS.NS



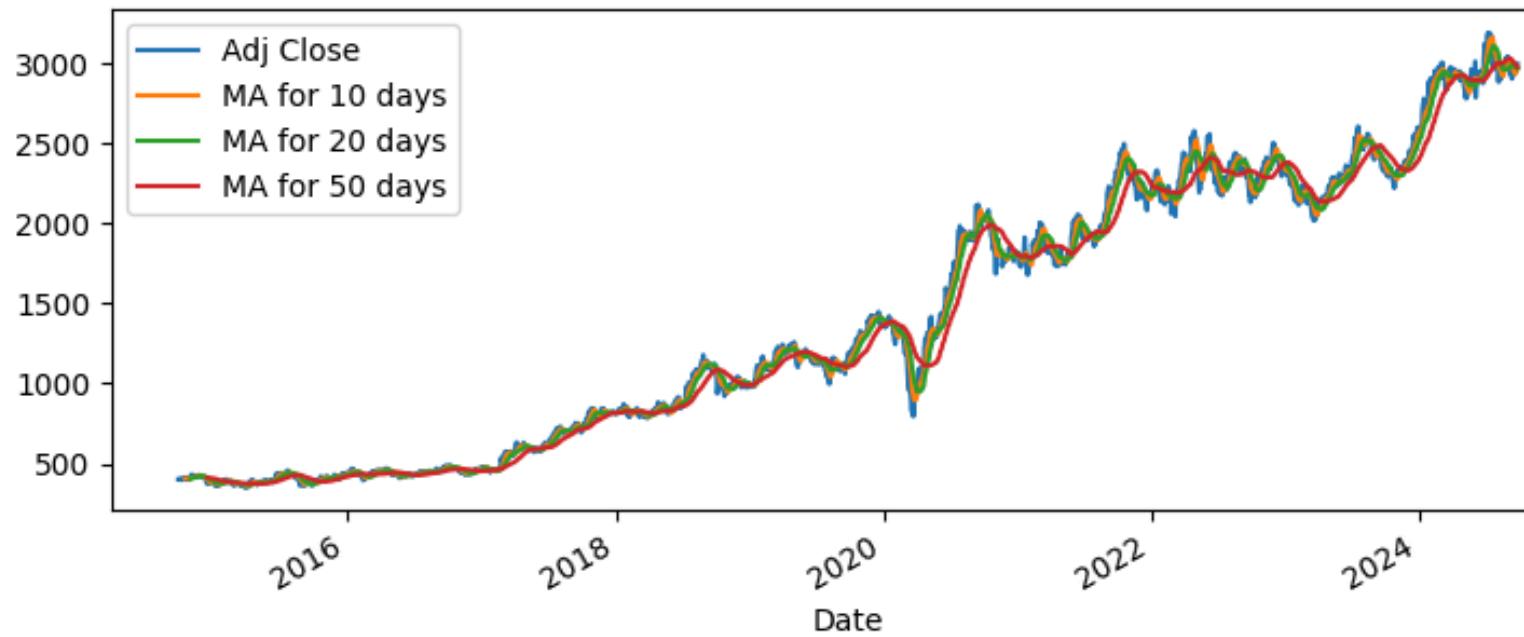
Closing Price of KOTAKBANK.NS



Closing Price of TATASTEEL.NS



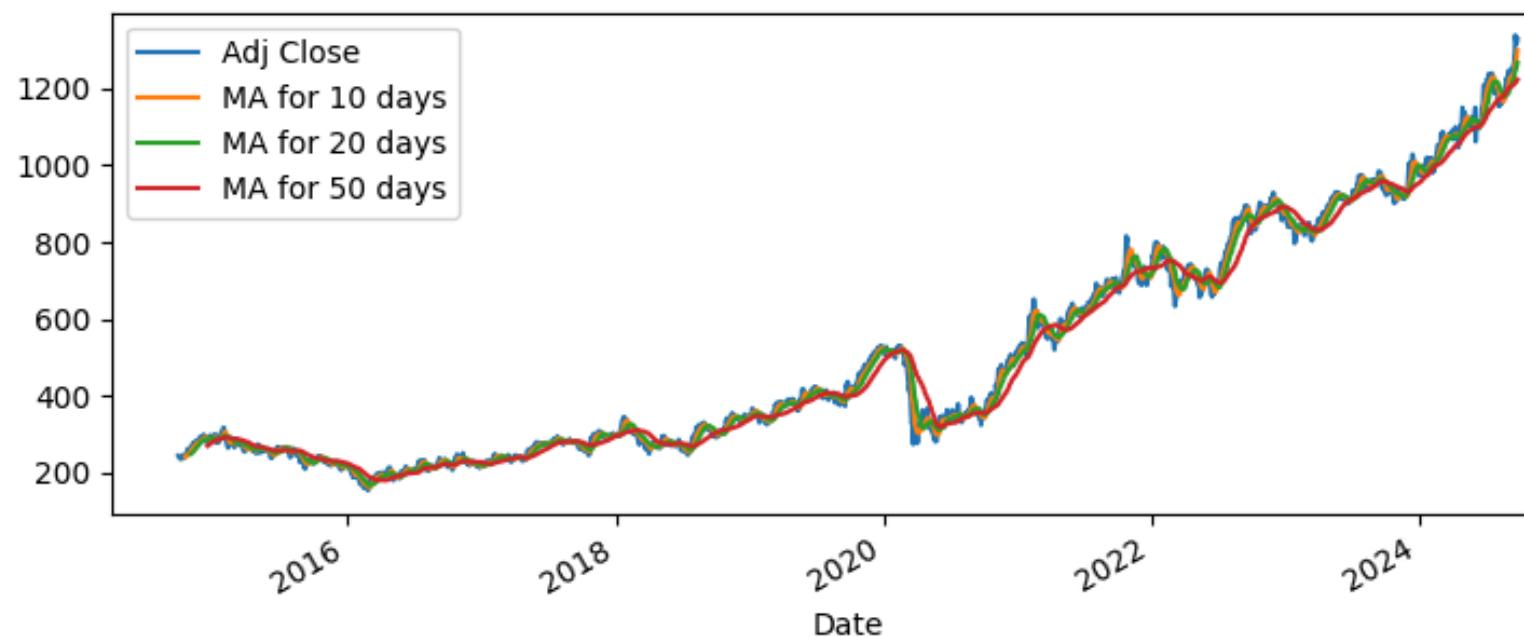
RELIANCE.NS



HDFCBANK.NS



ICICIBANK.NS



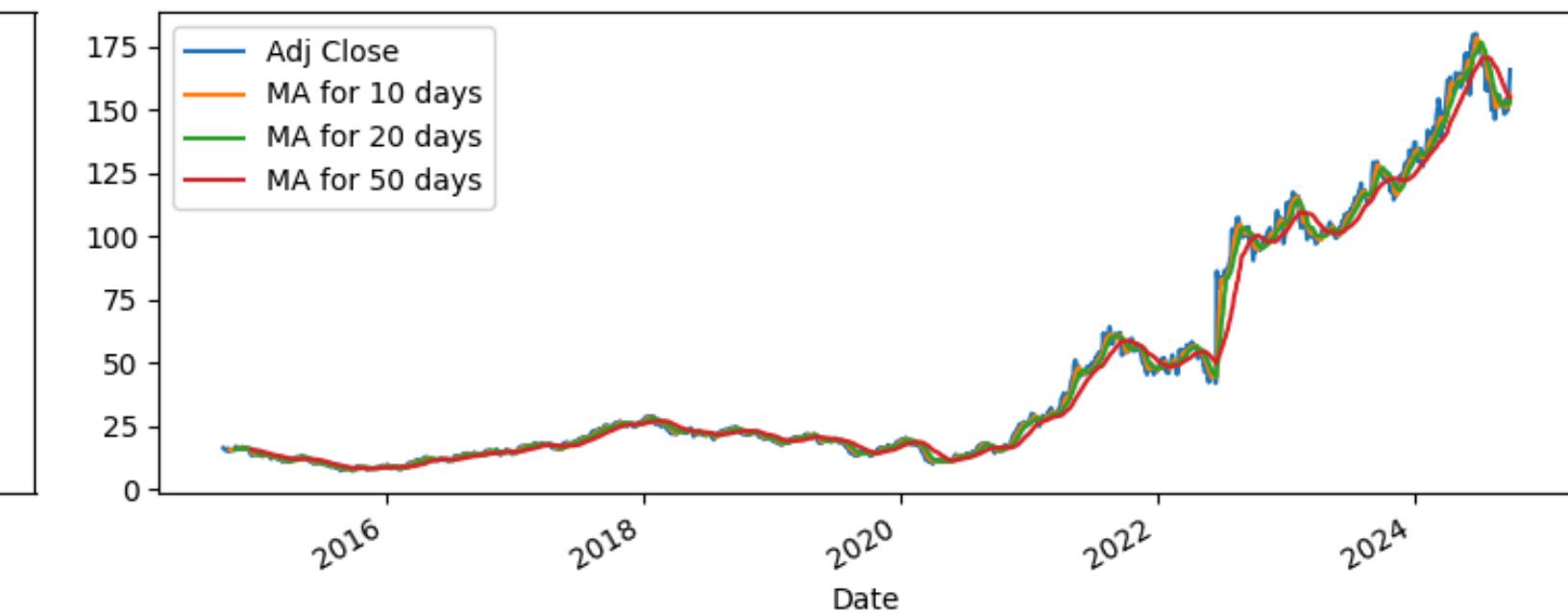
TCS.NS

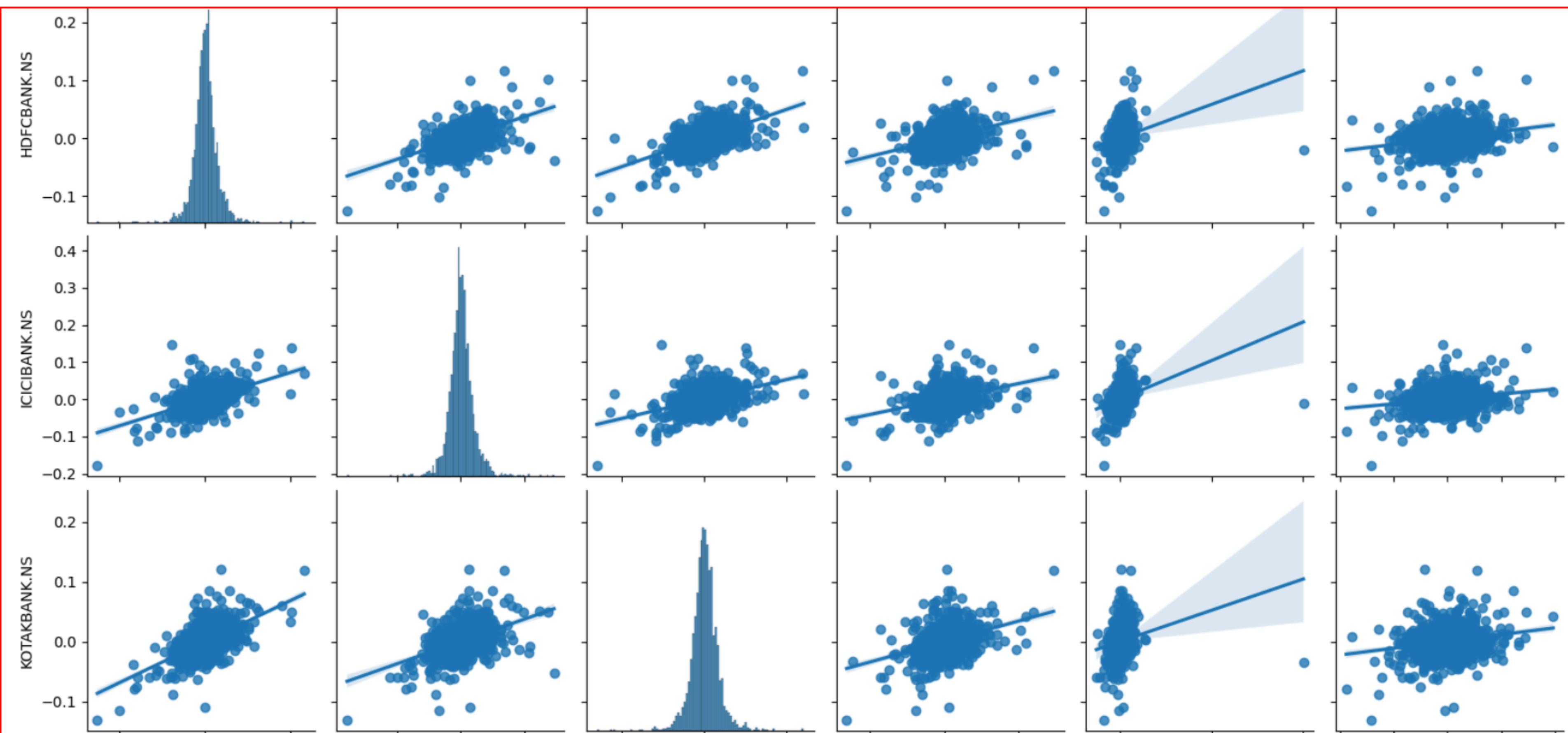


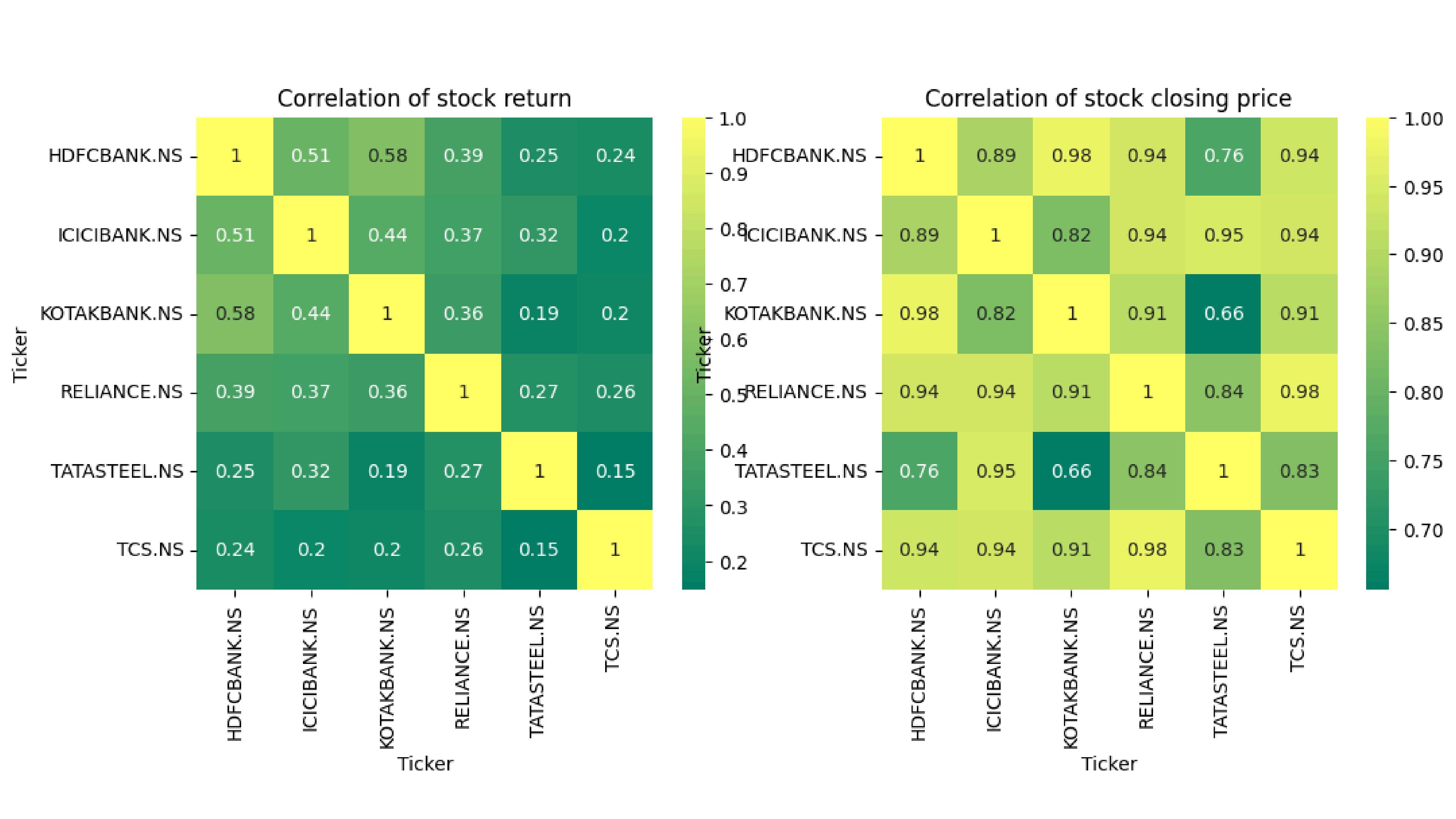
KOTAKBANK.NS

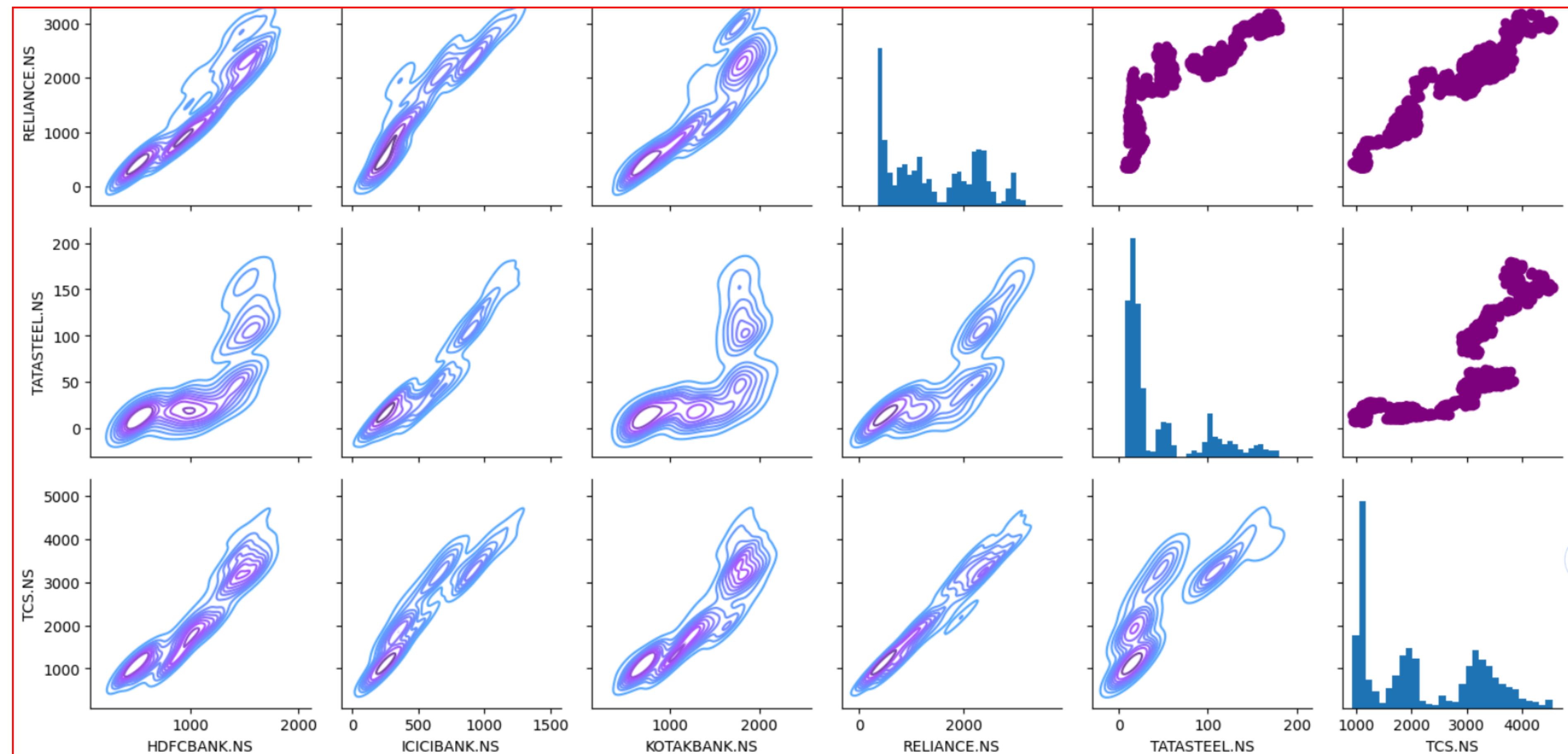


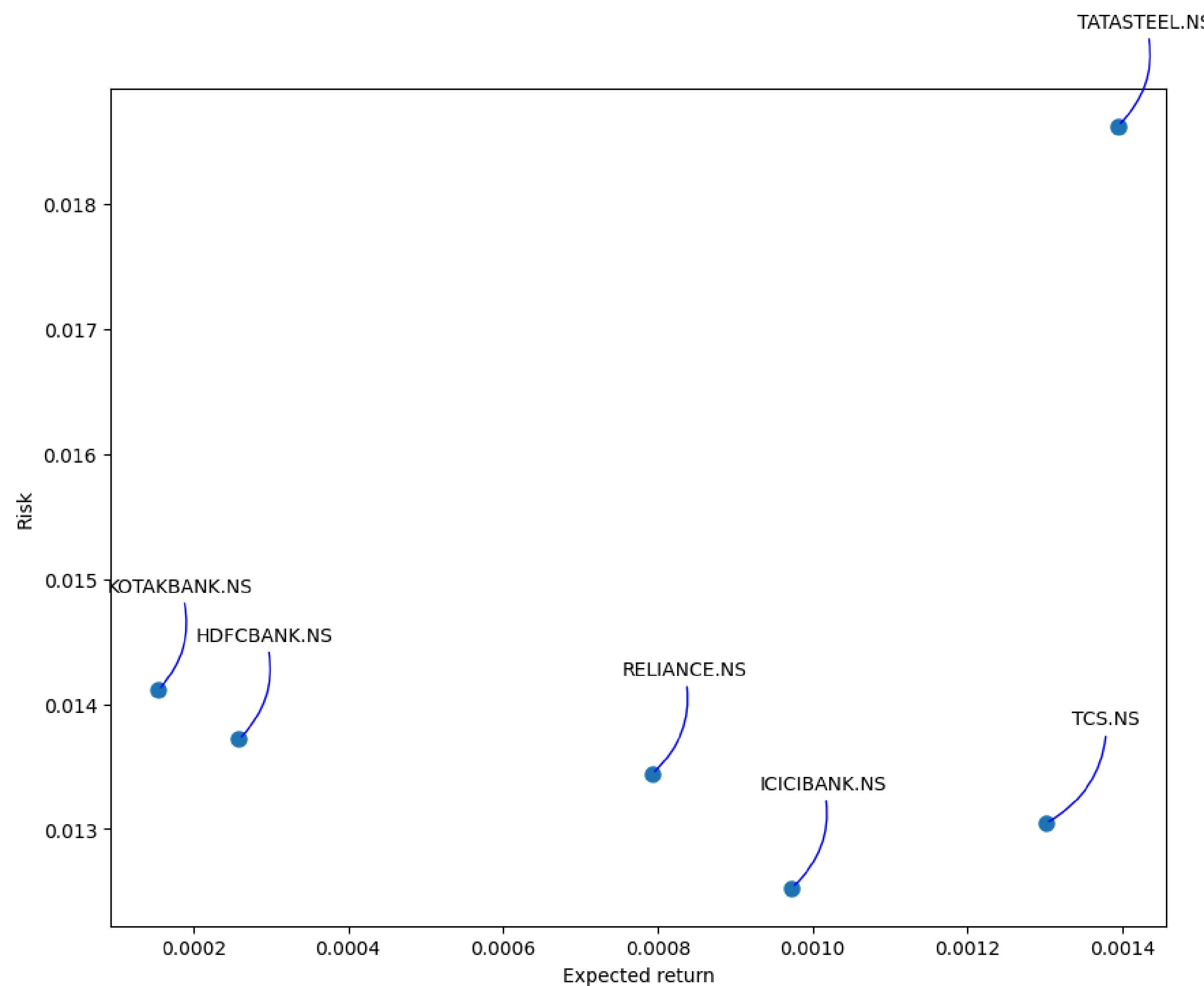
TATASTEEL.NS



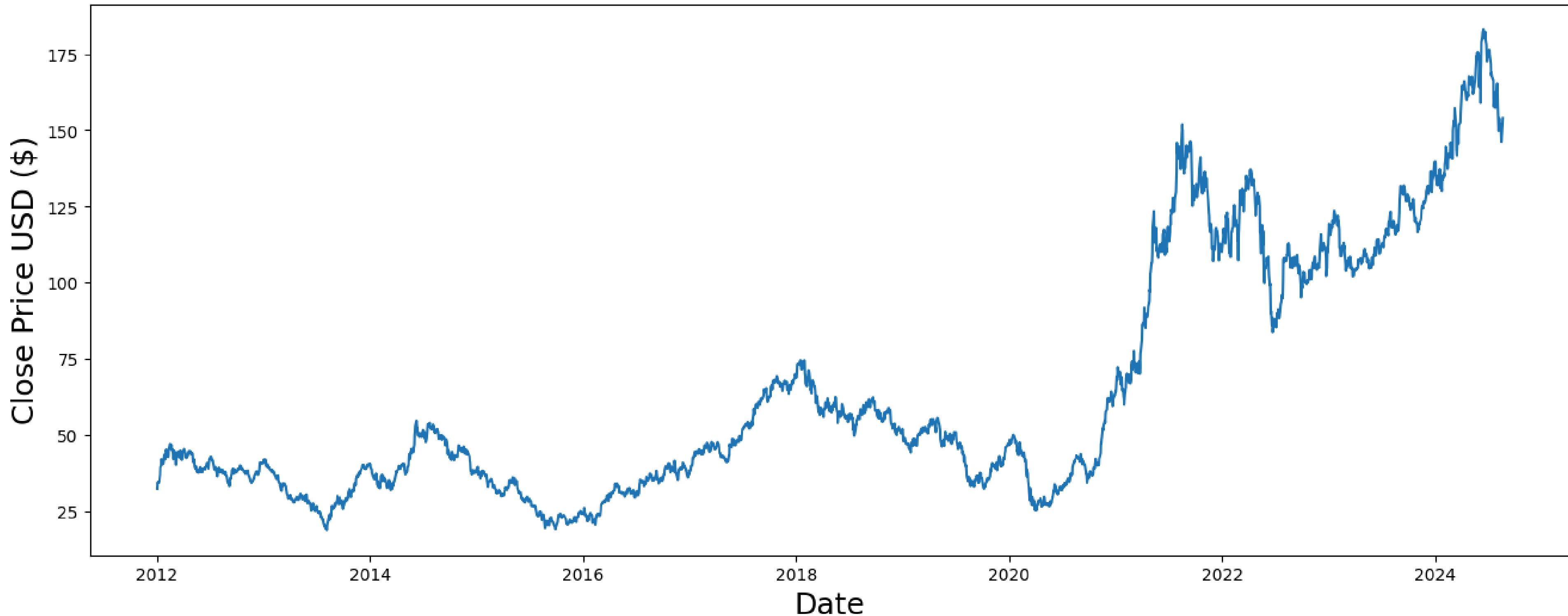




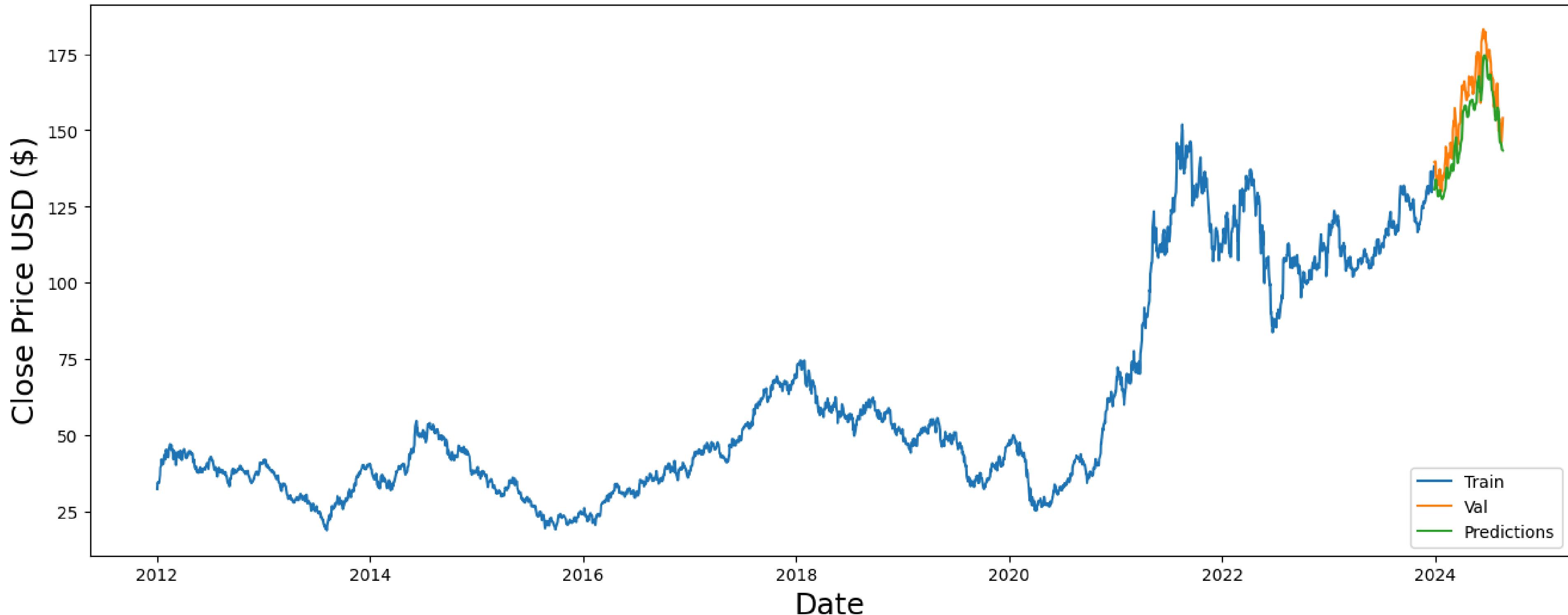




Close Price History



Model



Stock Selection & Analysis

Select Stock Ticker

AAPL

Select Timeframe

5y

LSTM Model Training

Epochs

10

- +

Batch Size

32

- +

LSTM Units

50

- +

Run Analysis

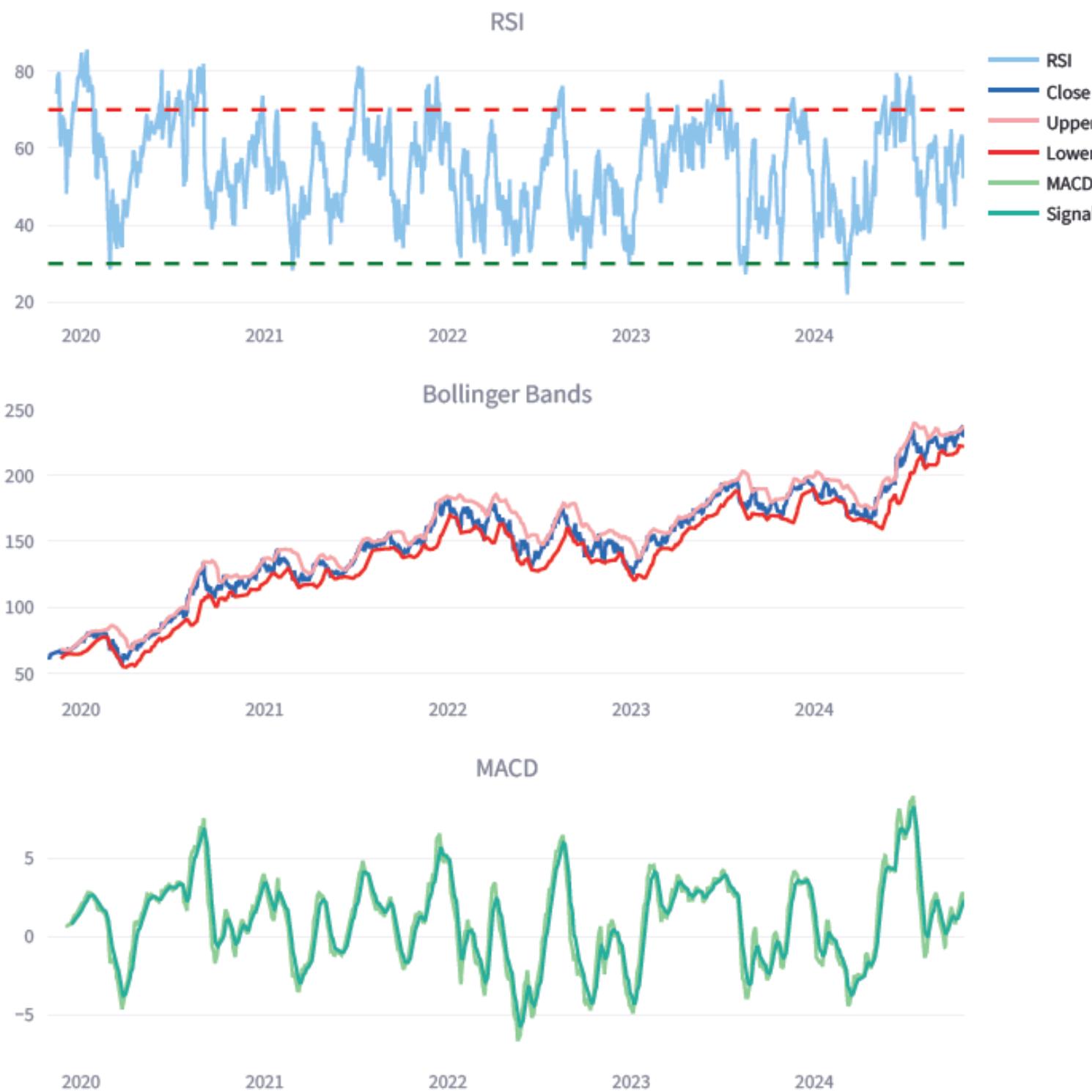
AI Trade-master - Comprehensive Stock Dashboard

Trading Signals

Price Chart with Trading Signals



Technical Indicators



Model Performance Metrics

RMSE

0.92

MAE

0.65

Predicted Stock Price

Next Day Prediction

\$233.21

Backtesting Results

Initial Capital

\$100,000.00

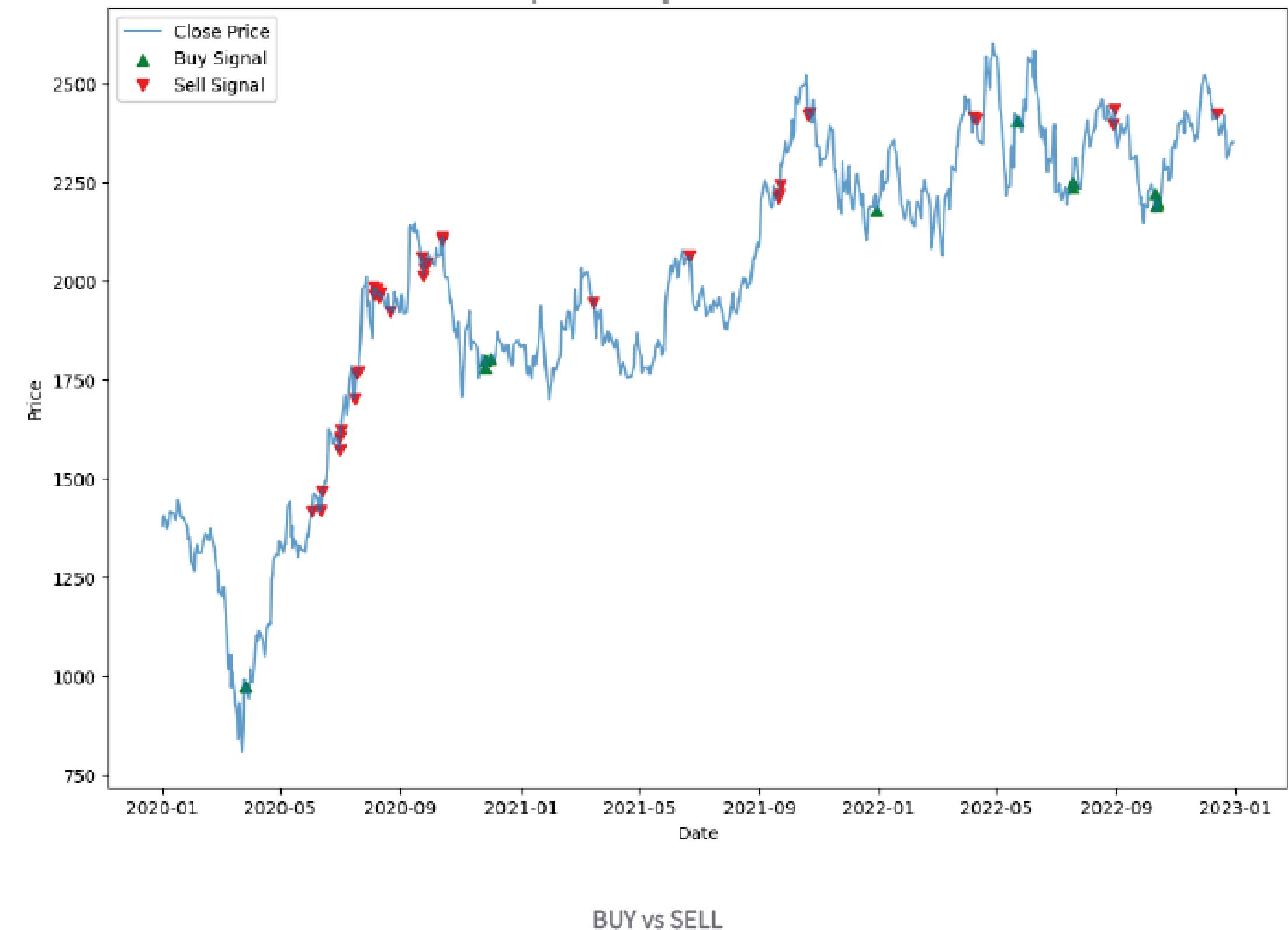
Final Portfolio Value

\$248,518.87

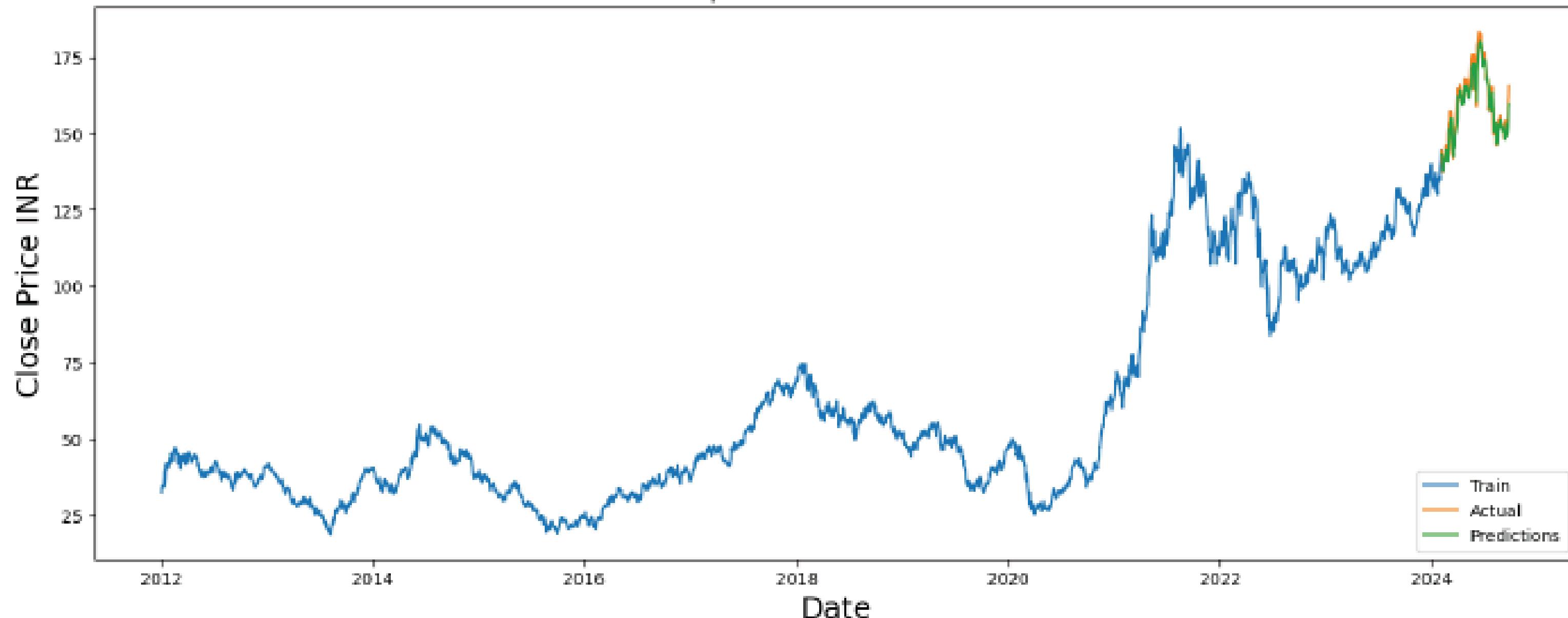
Total Return

148.52%

	Action	Date	Price
0	Buy	2019-11-04 00:00:00	62.2921
1	Sell	2020-03-09 00:00:00	64.7361
2	Buy	2020-04-30 00:00:00	71.456
3	Sell	2021-02-26 00:00:00	118.8825
4	Buy	2021-04-13 00:00:00	131.7943
5	Sell	2021-05-18 00:00:00	122.6101
6	Buy	2021-06-17 00:00:00	129.4256
7	Sell	2021-10-04 00:00:00	136.8484
8	Buy	2021-10-21 00:00:00	147.0181
9	Sell	2022-02-25 00:00:00	162.5785



Optimized Model Predictions



Actual vs predicted

Stock Selection & Analysis

Select Stock Ticker

AAPL

Select Timeframe

5y

LSTM Model Training

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- +

Batch Size

32

- +

LSTM Units

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- +

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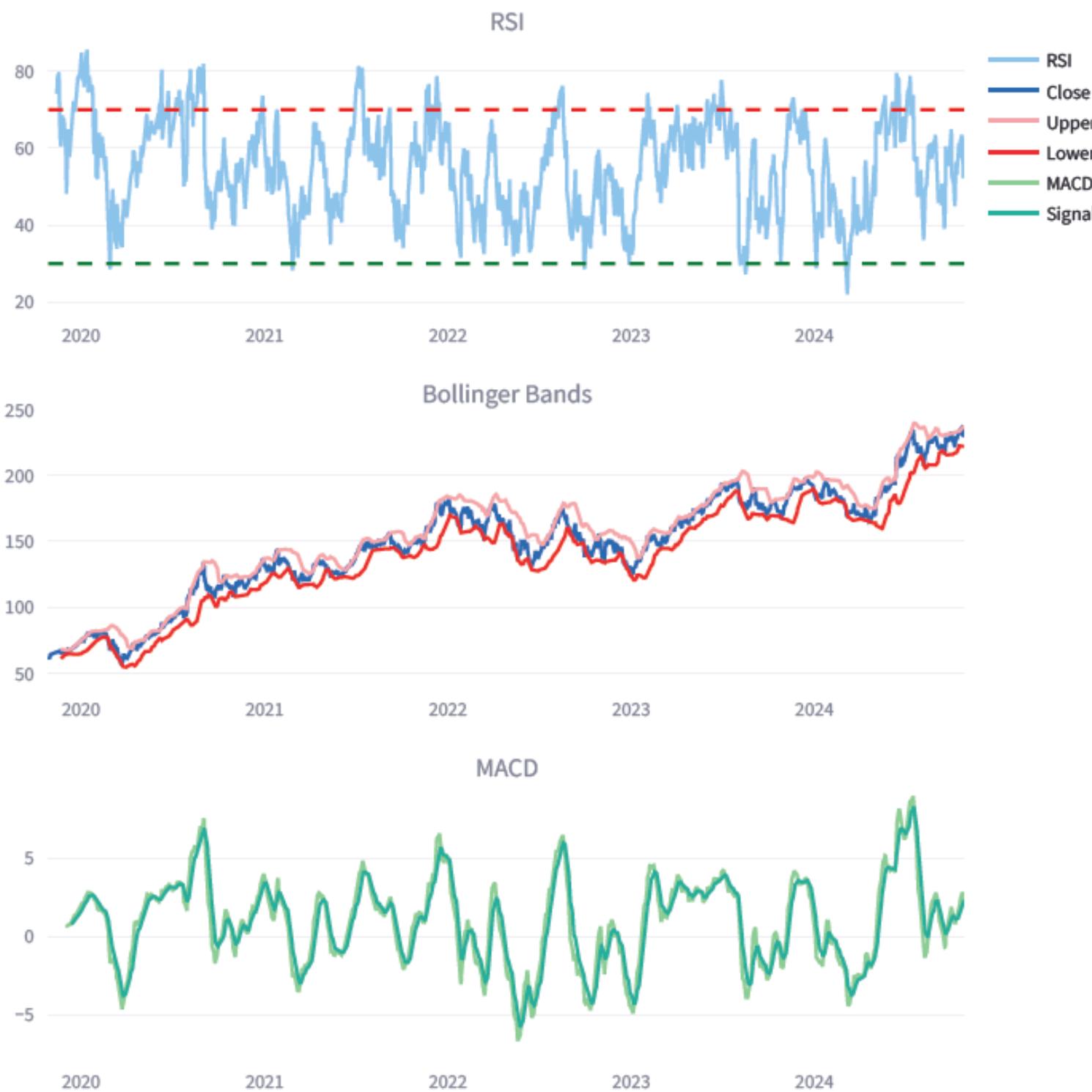
AI Trade-master - Comprehensive Stock Dashboard

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Technical Indicators



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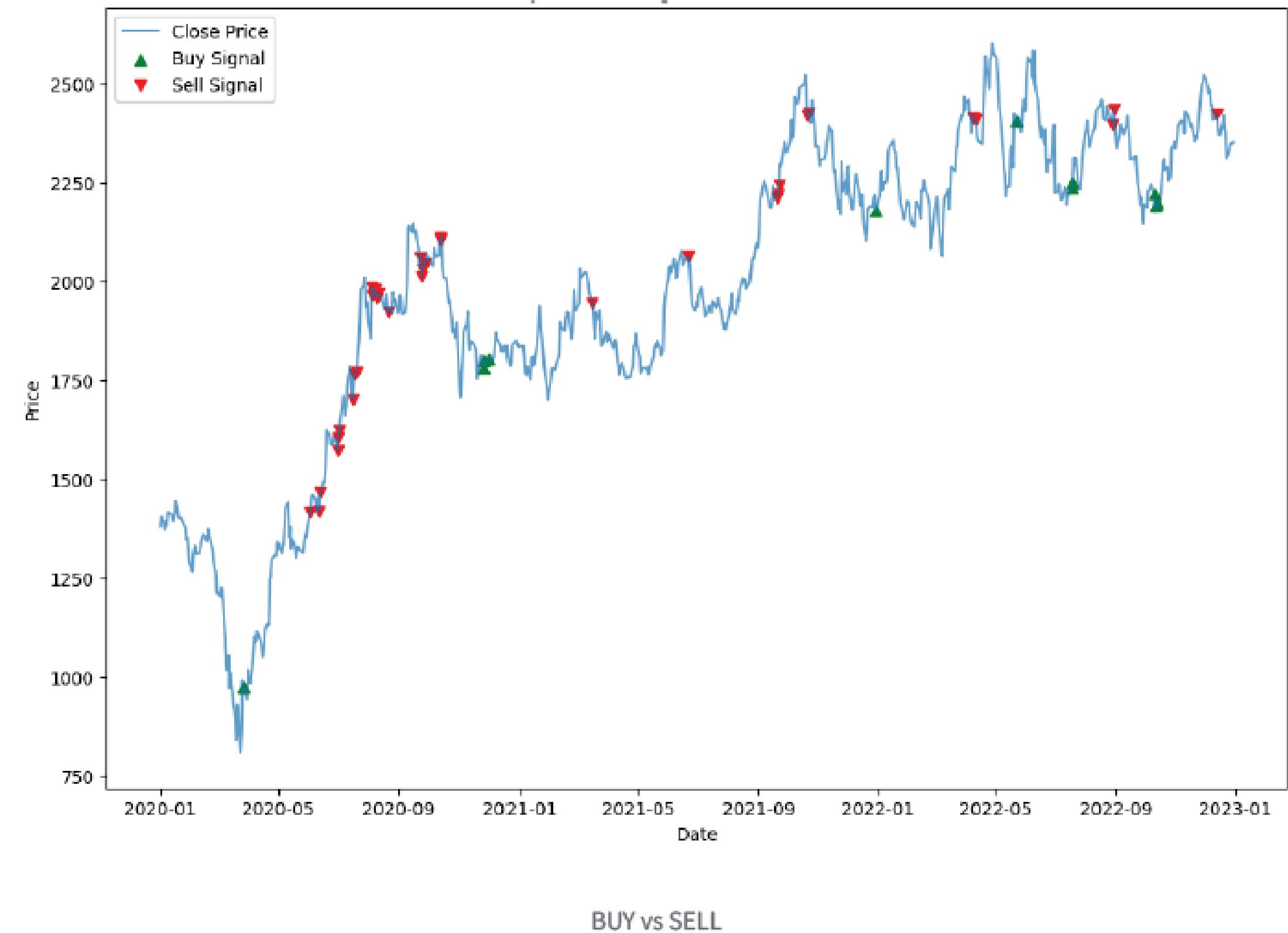
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\$248,518.87

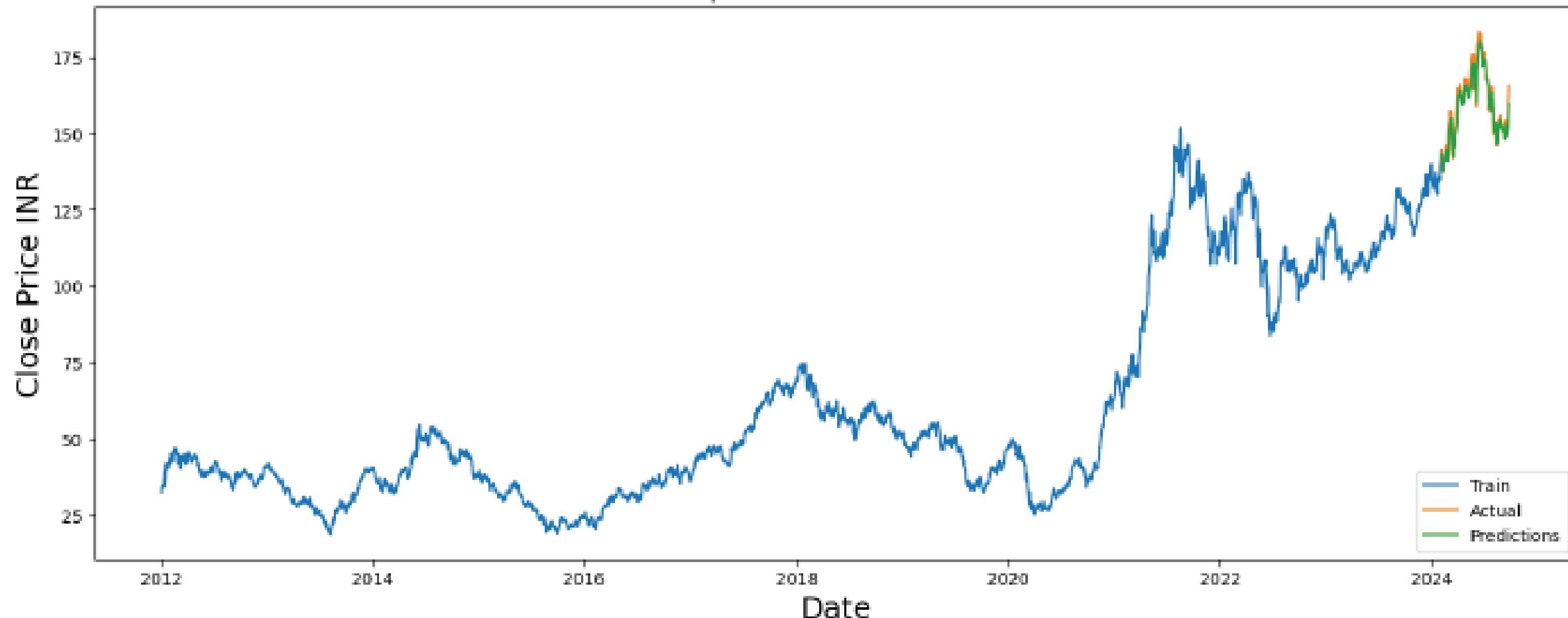
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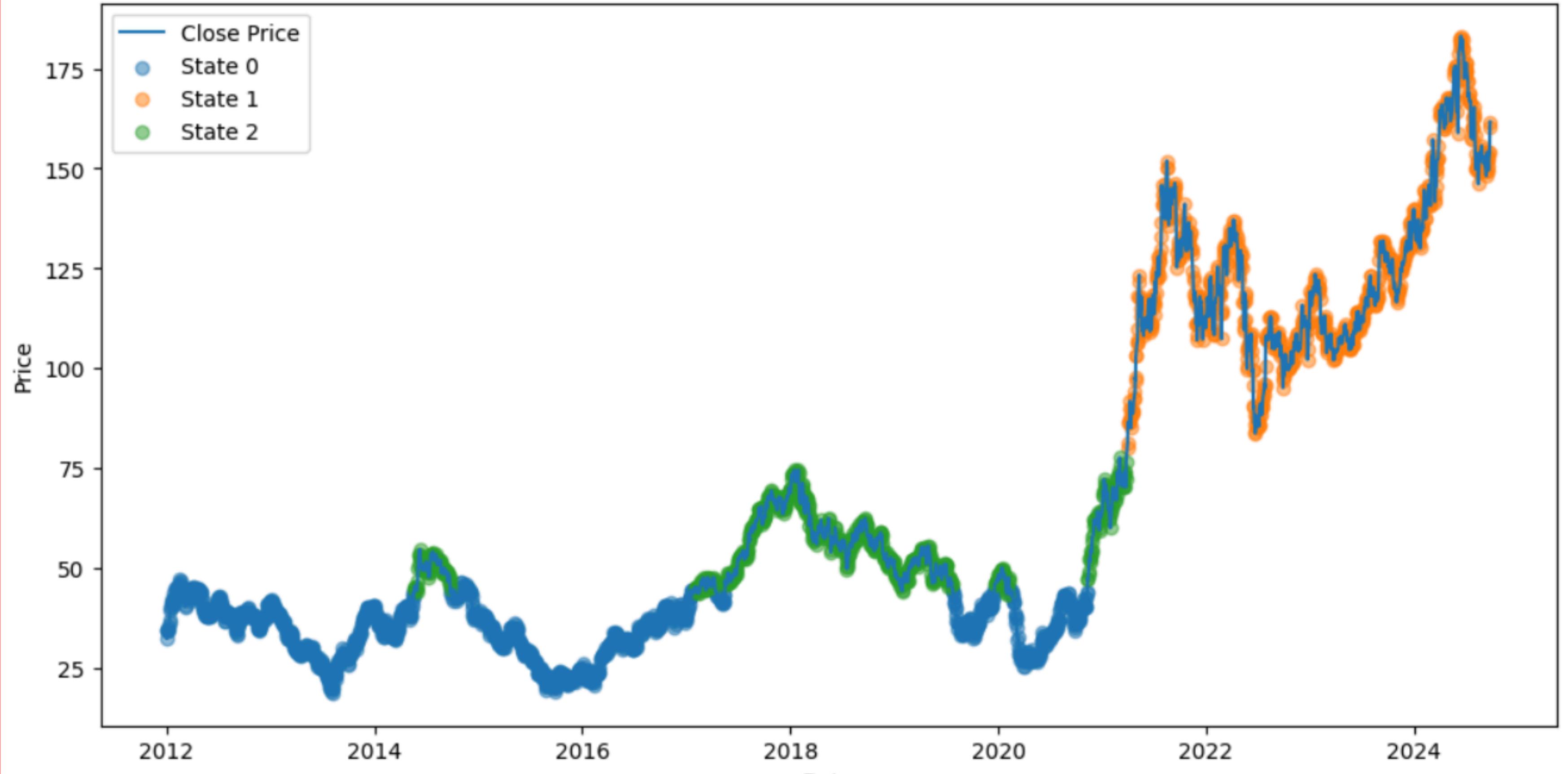


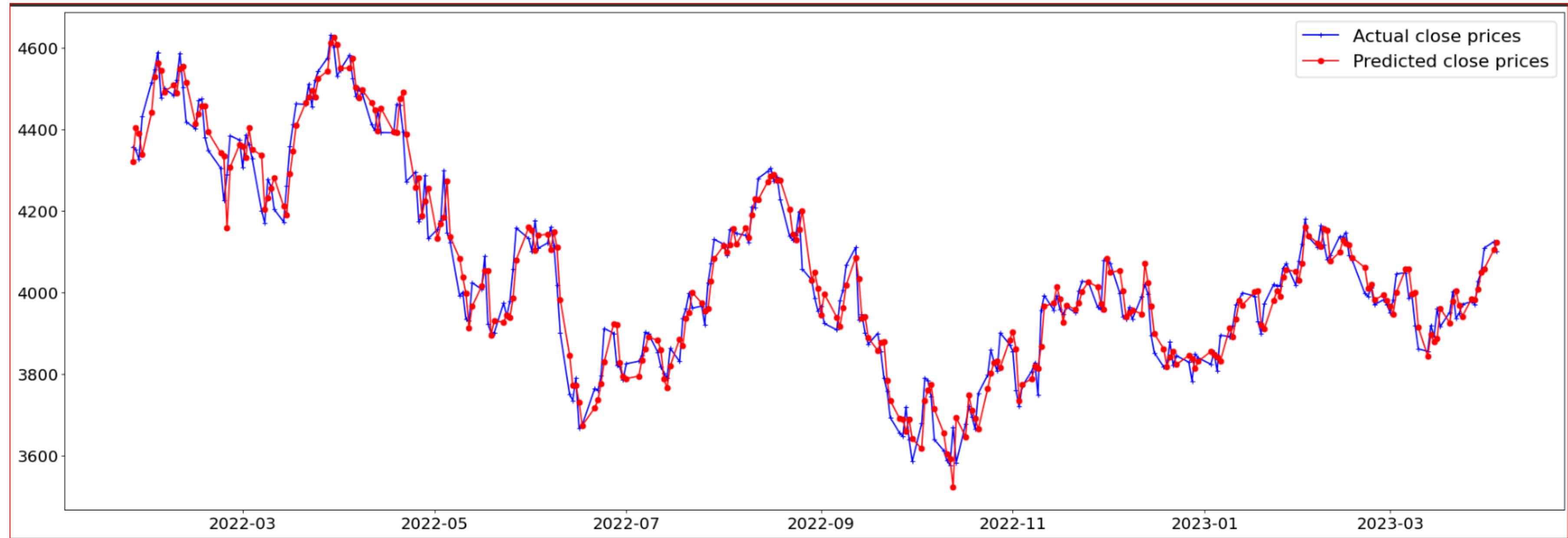
Optimized Model Predictions



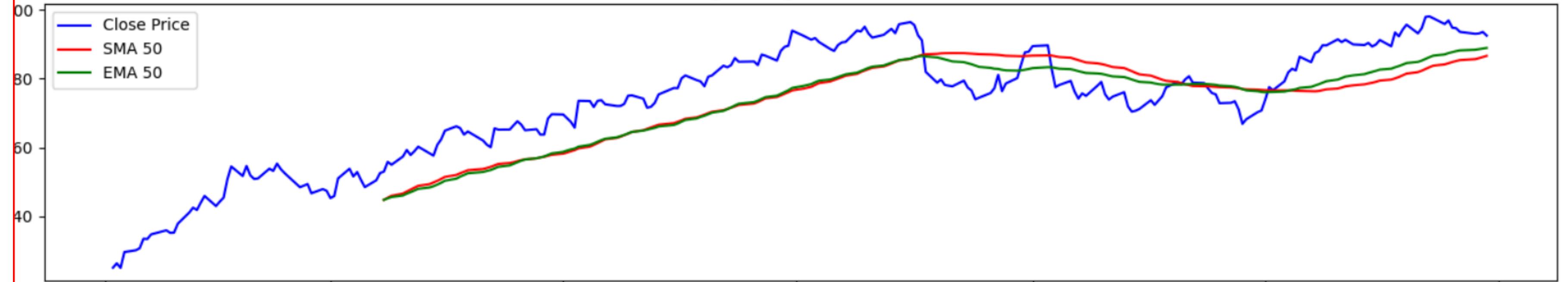
Actual vs predicted

TATASTEEL.NS Stock Price with HMM States

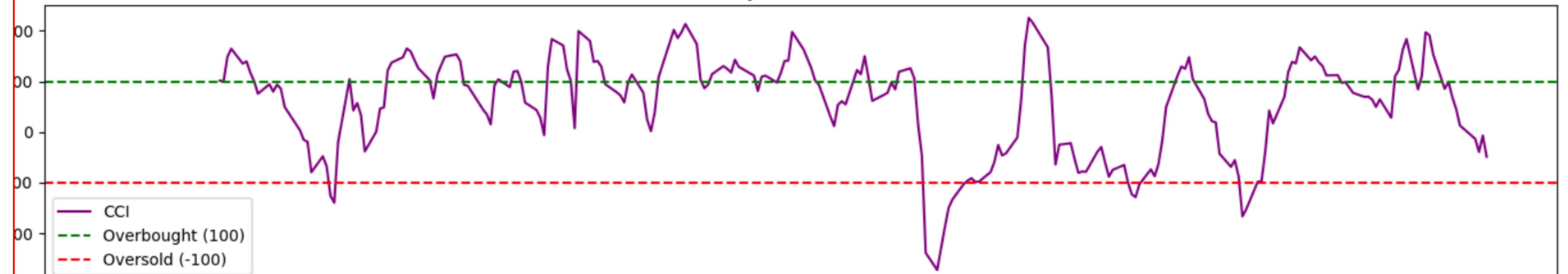




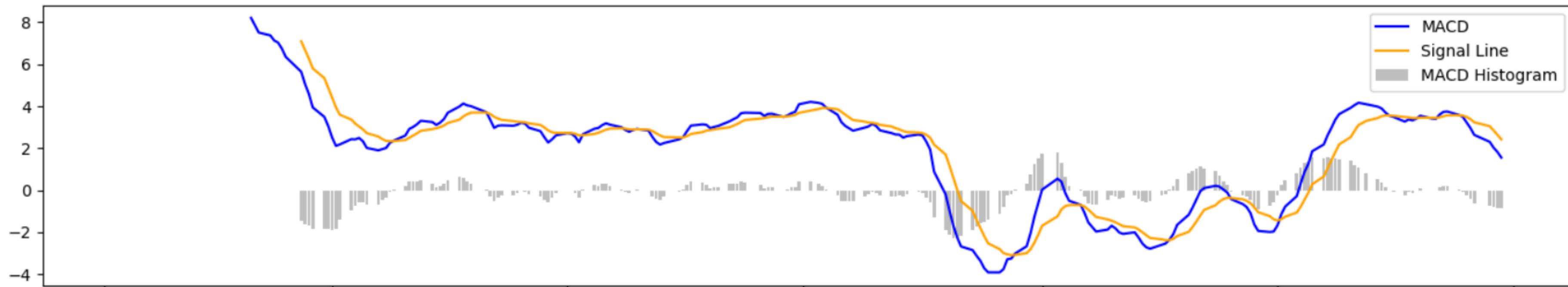
Moving Averages (SMA & EMA)



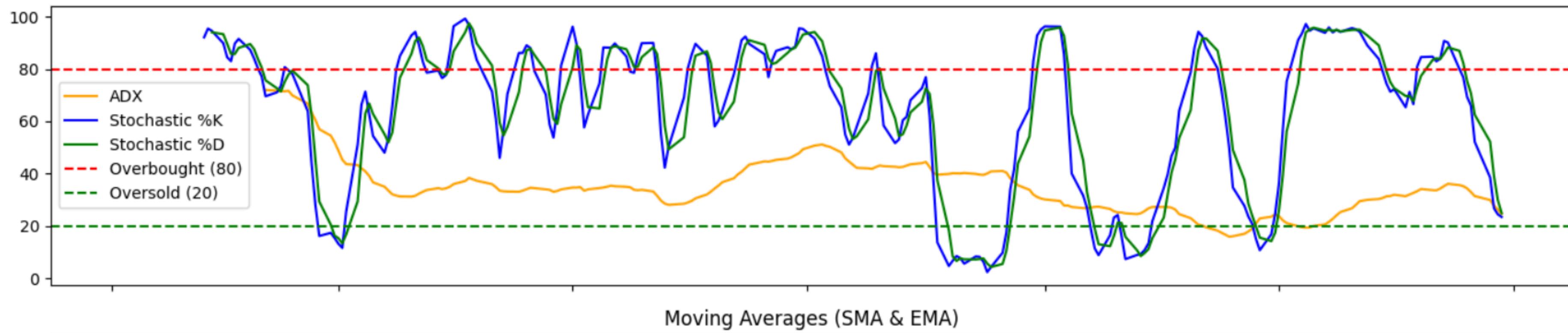
Commodity Channel Index (CCI)



MACD



ADX and Stochastic Oscillator



Moving Averages (SMA & EMA)

```
tk_data] Downloading package vader_lexicon to /root/nltk_data...
tk_data] Package vader_lexicon is already up-to-date!
*****100%*****] 1 of 1 completedFetching news for AAPL: 401
led to fetch news articles for AAPL: {'status': 'error', 'code': 'apiKeyInvalid', 'message': 'Your API key is invalid or incorrect. Check your key, or go to https://newsapi.org'}
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*****100%*****] 1 of 1 completedFetching news for TSLA: 401
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nificant correlations found:
```

```
install requests beautifulsoup4 pandas numpy nltk
```

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uirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-packages (4.12.3)
uirement already satisfied: pandas in /usr/local/lib/python3.10/dist-packages (2.1.4)
uirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (1.26.4)
uirement already satisfied: nltk in /usr/local/lib/python3.10/dist-packages (3.8.1)
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uirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests) (3.10)
uirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests) (2.2.3)
uirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests) (2024.8.30)
```

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Executing (1m 44s) <cell line: 4> > score() > _score() > _score_log() > _compute_log_likelihood() > log_multivariate_normal_density() > _log_multivariate_normal_densit... > cholesky() > _cholesky()
```

Average sentiment for NVDA: 0.15554065656565663

Date	Open	High	Low	Close	\
2024-11-06 00:00:00-05:00	142.960007	146.490005	141.960007	145.610001	
2024-11-07 00:00:00-05:00	146.389999	148.929993	146.169998	148.880005	
2024-11-08 00:00:00-05:00	148.770004	149.770004	146.259995	147.630005	
2024-11-11 00:00:00-05:00	148.679993	148.850006	143.570007	145.259995	
2024-11-12 00:00:00-05:00	146.779999	149.649994	146.009995	148.289993	

Date	Volume	Dividends	Stock Splits
2024-11-06 00:00:00-05:00	242043900	0.0	0.0
2024-11-07 00:00:00-05:00	207323300	0.0	0.0
2024-11-08 00:00:00-05:00	175665800	0.0	0.0
2024-11-11 00:00:00-05:00	182325600	0.0	0.0
2024-11-12 00:00:00-05:00	198023300	0.0	0.0

USER DASHBOARD

Stock Selection & Analysis

Select Stock Ticker

Select Timeframe

LSTM Model Training

Epochs

Batch Size

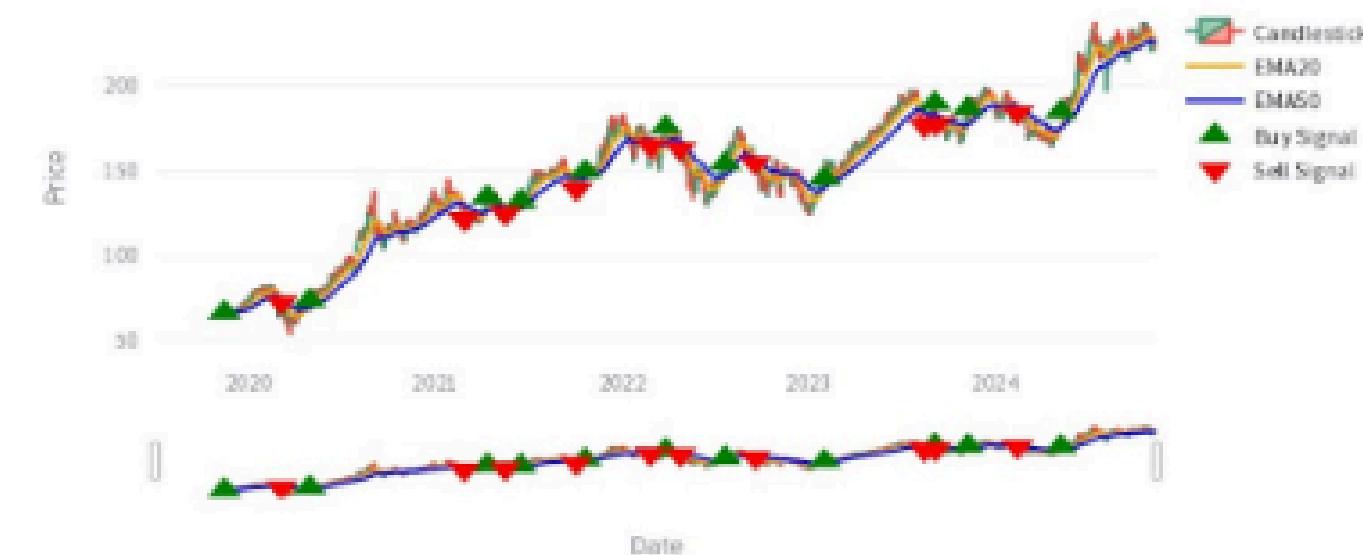
LSTM Units

Run Analysis

AI Trade-master - Comprehensive Stock Dashboard

Trading Signals

Price Chart with Trading Signals



Technical Indicators

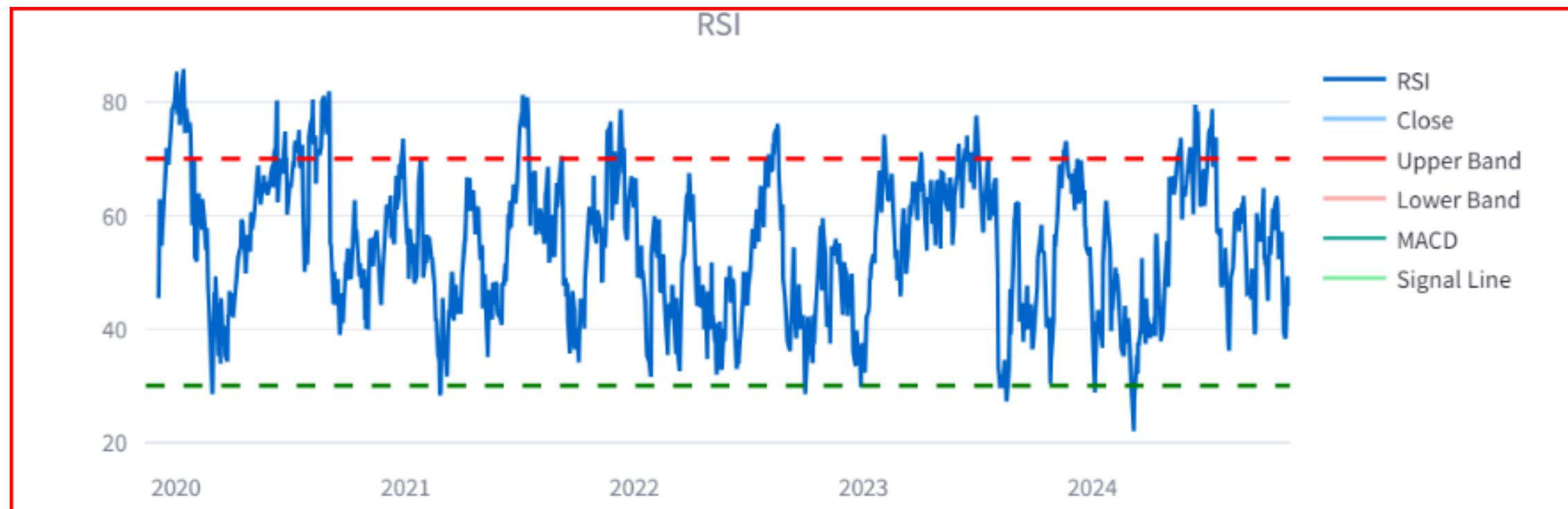


Figure 3: The RSI(Relative Strength Index) of the AAPL stock for the past 5 years

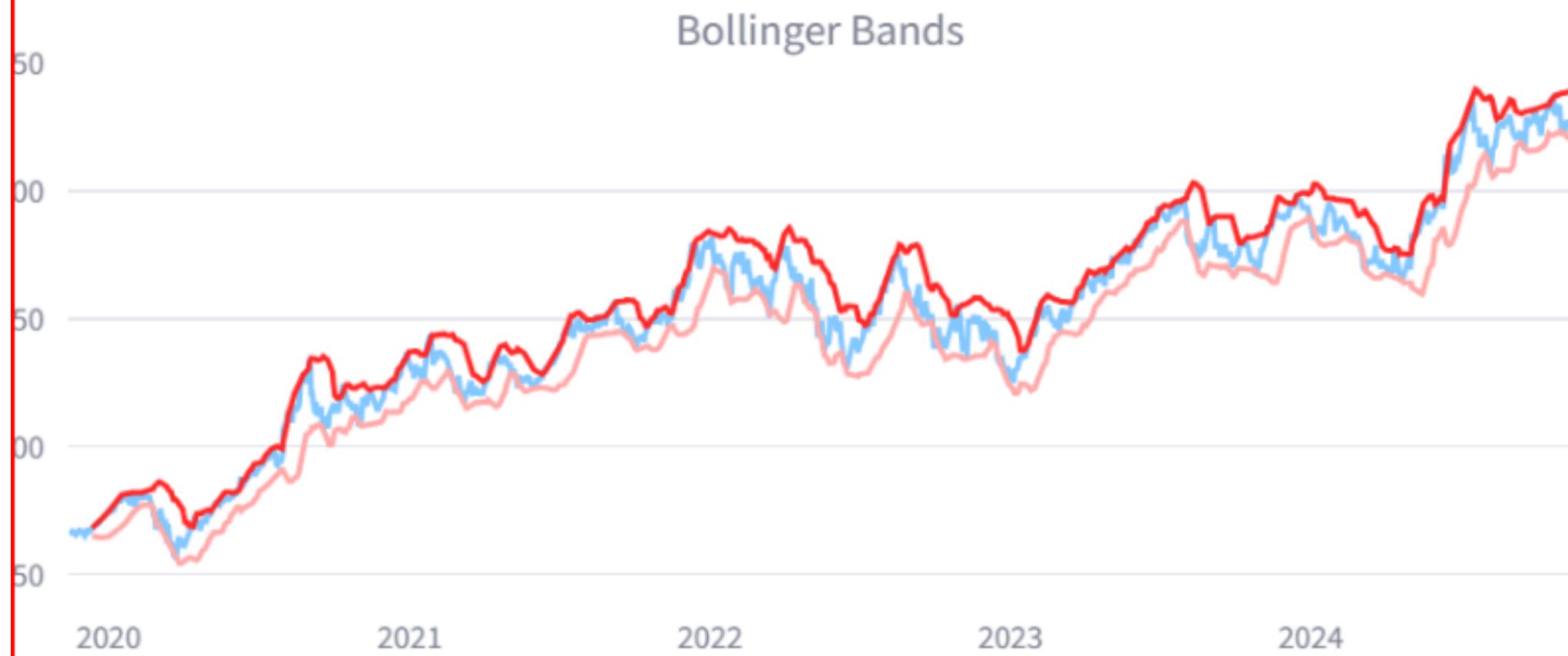


Figure 4: The Bollinger Bands of the AAPL stock for the past 5 years

Return Percentage with Initial Capital ↴

Initial Capital:

\$100,000

Final Portfolio Value:

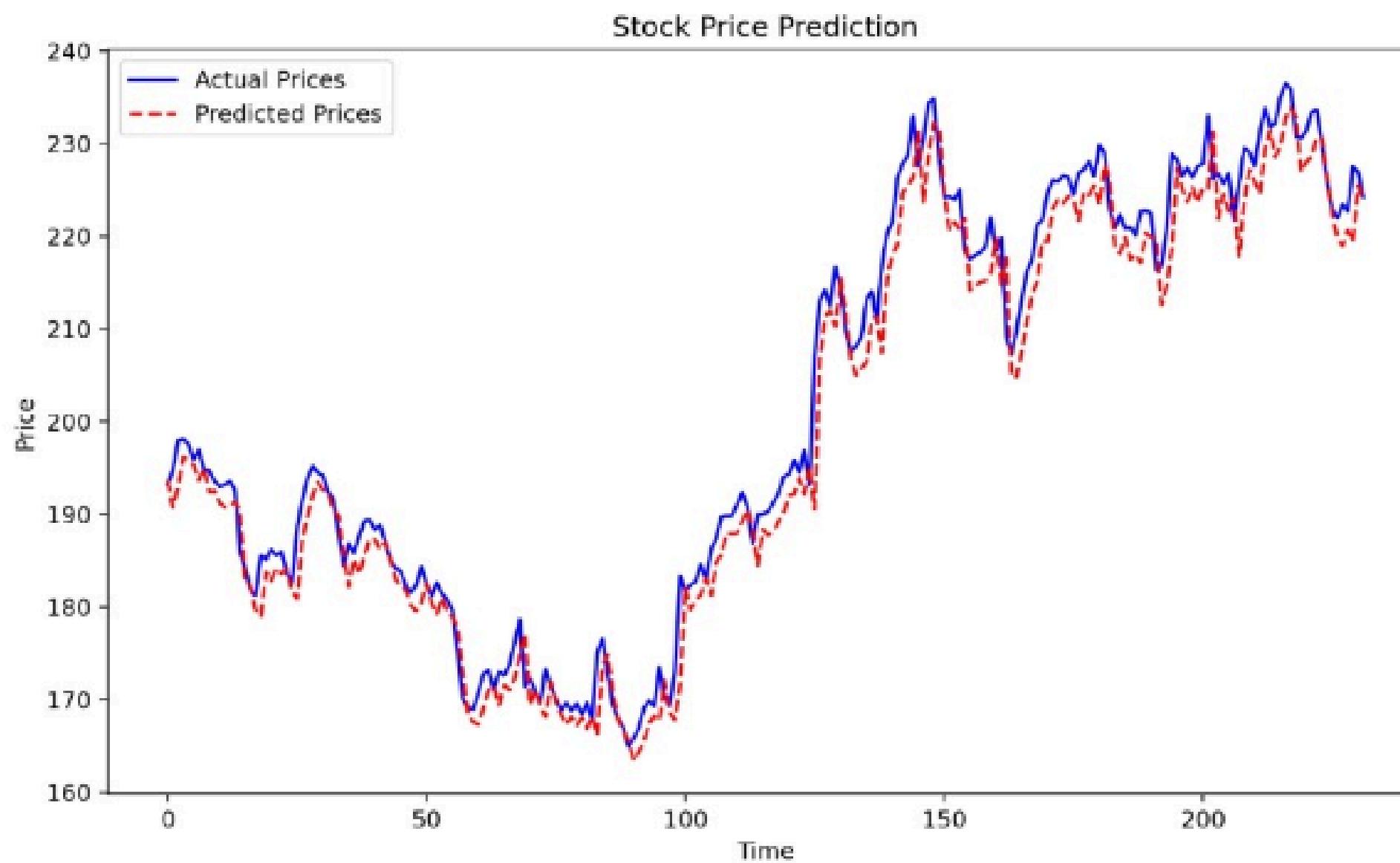
\$252882.06

Return Percentage:

152.88%

	Action	Date	Price
0	Buy	2019-11-15 00:00:00	64.4124
1	Sell	2020-03-06 00:00:00	70.2187
2	Buy	2020-04-30 00:00:00	71.3775
3	Sell	2021-02-26 00:00:00	118.7519
4	Buy	2021-04-13 00:00:00	131.6495
5	Sell	2021-05-18 00:00:00	122.4753
6	Buy	2021-06-17 00:00:00	129.2833
7	Sell	2021-10-04 00:00:00	136.698
8	Buy	2021-10-21 00:00:00	146.8565
9	Sell	2022-02-25 00:00:00	162.3998

Actual vs Predicted Prices ↴



Return Percentage with Initial Capital

Initial Capital:

\$100,000

Final Portfolio Value:

\$252882.06

Return Percentage:

152.88%

7. Backtesting

7.1 Backtesting Framework:

The backtesting module evaluates the system's performance across a historical dataset spanning 12 years. Metrics including return on investment (ROI), maximum drawdown, Sharpe ratio, and win/loss ratio are used to gauge the model's effectiveness in realistic trading conditions.





THANK YOU