



Team Name- StockMind.ai

Stock Price Prediction Using LSTM Algorithm

New Era New Technology!

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Problem Statement

This project is about developing a predictive model that uses historical stock price data to predict future stock prices.

The project aims to leverage deep learning, specifically LSTM (Long Short-Term Memory) neural networks, to build a model that can capture complex patterns and relationships in data and make accurate predictions.

In the project, historical stock price data is collected, cleaned, and preprocessed, the LSTM model is trained on the data, and its performance is evaluated using various metrics to assess how well the model predicts future stock prices.

Literature Review

S.No.	Paper Name And Year	Inferences
1.	"Stock Price Prediction Using LSTM, RNN, and CNN-SVR Hybrid Models" by Yifei Zhang, Jun Deng, and Xiao Deng (2019). "Stock Price Prediction Using LSTM, RNN, and CNN-SVR Hybrid Models" by Yifei Zhang, Jun Deng, and Xiao Deng (2019).	In this paper, the authors compare the performance of LSTM, RNN, and CNN-SVR hybrid models for stock price prediction. The results show that LSTM outperforms the other models in terms of accuracy and efficiency.
2.	"Stock Price Prediction Using Deep Learning and Hybrid Models" by Abhishek Kumar, Vinay Kumar, and Gagandeep Kaur (2019).	This paper uses LSTM and a hybrid model combining LSTM and random forest for stock price prediction. The results show that the hybrid model achieves better performance than LSTM alone.
3.	Stock Price Prediction with LSTM and Random Walk Theory" by Kaijian He, Hanxuan Yang, and Yiran Cui (2018)	In this paper, LSTM and random walk theory are combined to predict stock prices. LSTM and random walk theory alone are both outperformed by the hybrid model.

Literature Review

S.No.	Paper Name And Year	Inferences
4.	"Stock Market Prediction using LSTM and Sentiment Analysis" by Dipta Das et al. (2018).	The authors use LSTM and sentiment analysis to predict the stock market in this paper. The results show that the proposed model achieves better performance than traditional models.
5.	Stock Price Prediction Using LSTM with Financial Indicators" by Aishwarya Kachhwaha et al. (2019)."	This paper proposes a model that combines LSTM with financial indicators for stock price prediction. The paper concludes that the proposed model outperforms traditional models.
6.	On the Difficulty of Training Recurrent Neural Networks" by Razvan Pascanu, Tomas Mikolov, and Yoshua Bengio (2013)	The paper investigates the difficulty of training recurrent neural networks. RNNs have poor performance on long-term dependencies because of the vanishing gradient problem.

Limitations

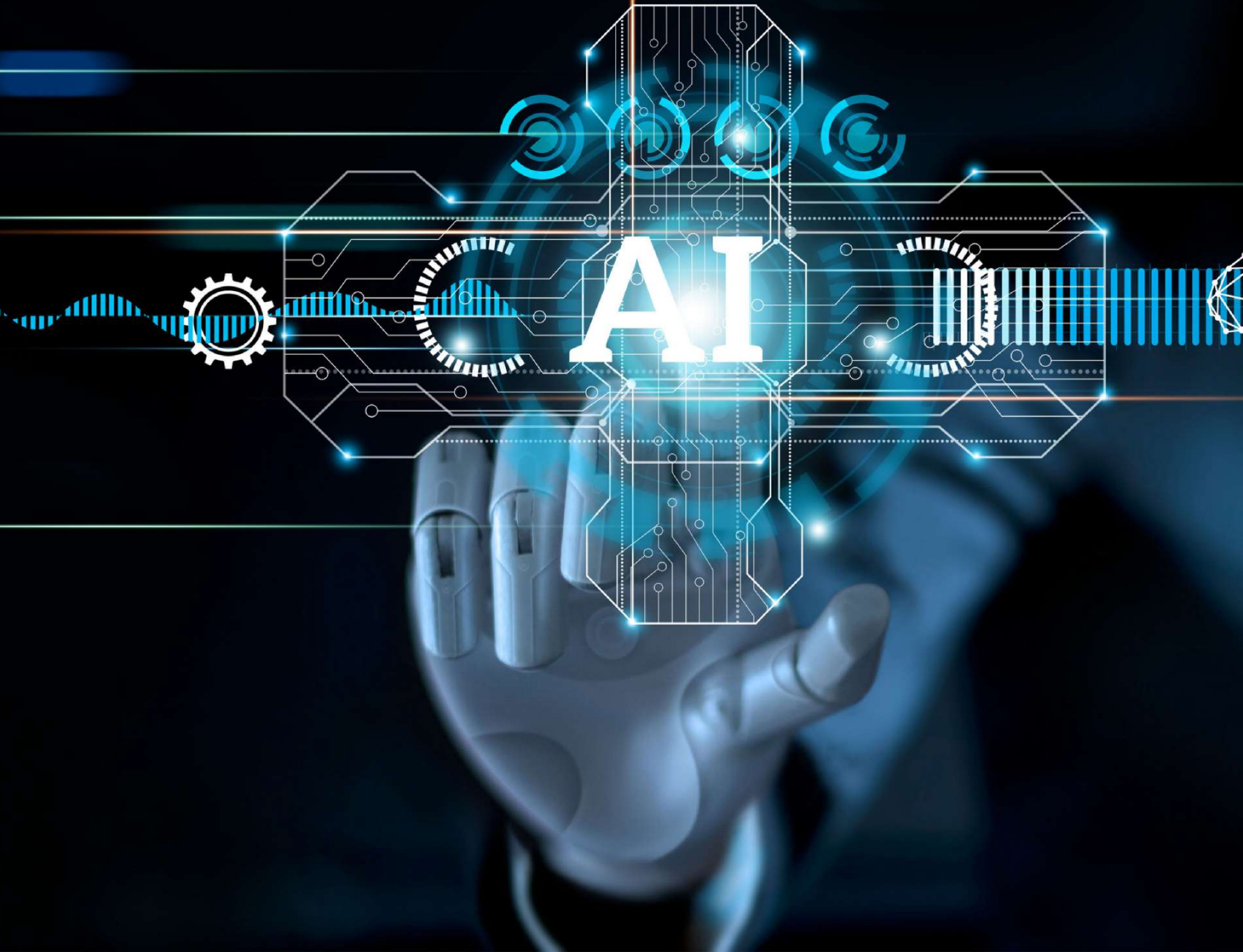
- Vanishing gradients - {6}
- Overfitting - {4}
- Feature selection bias - {5}
- Limited ability to handle sudden changes - {1}

Objectives

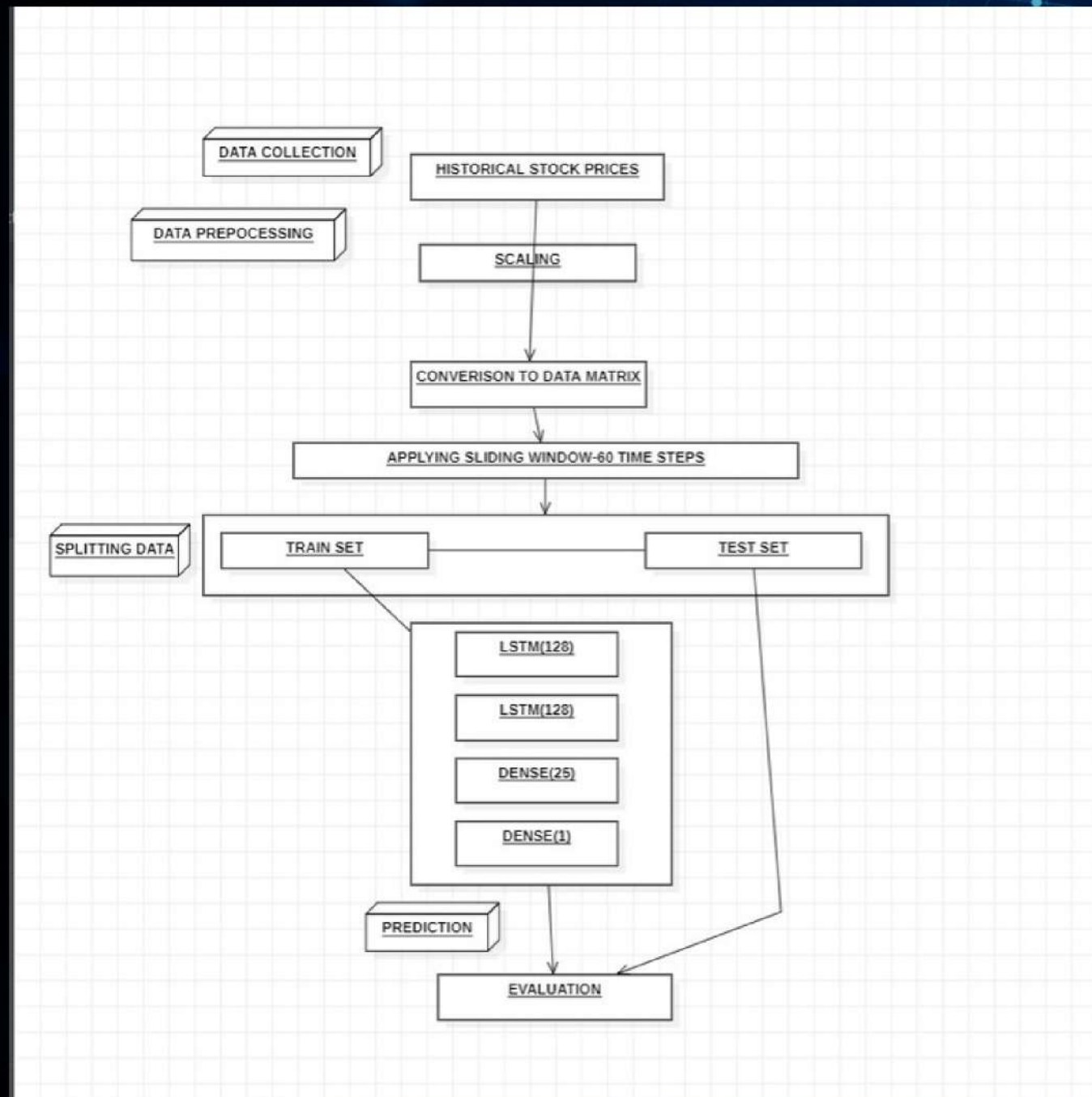
The primary objective of stock prediction using LSTM is to forecast future prices or trends in the stock market.

Specifically, the objectives can be:

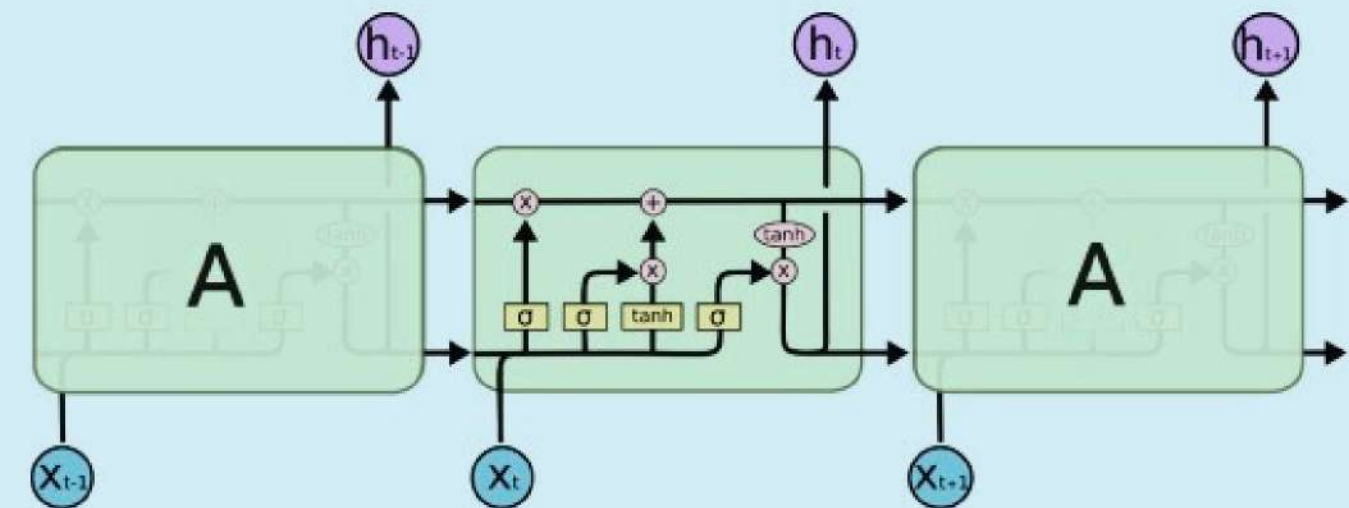
- Short-term prediction
- Long-term prediction
- Risk management
- Market analysis



Architecture Diagram



LSTM Architecture




Modules

- **Task 1** - Getting started with required files and dependencies
- **Task 2** - Creating a basic website layout
- **Task 3** - Styling the application's web page
- **Task 4** - Generating a company's information and graphs
- **Task 5** - Creating the machine learning model

We are going to use the yfinance python library to get company information (name, logo, and description) and stock price history. Dash's callback functions will be used to trigger updates based on changes in inputs.

We are now going to build a machine learning model - Long-Short Term Memory (LSTM) for predicting stock prices.









Implimentation


 LSTM model.ipynb ☆

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```
# import pandas_datareader.data as data
import pandas as pd
import datetime as dt
from datetime import date
import matplotlib.pyplot as plt
import yfinance as yf
import numpy as np
import tensorflow as tf
```

```
[ ] # Define start day to fetch the dataset from the yahoo finance library

START = "2015-01-01"
TODAY = date.today().strftime("%Y-%m-%d")

# Define a function to load the dataset


def load_data(ticker):
    data = yf.download(ticker, START, TODAY)
    data.reset_index(inplace=True)
    return data
```

```
[ ] data = load_data('AAPL')
df=data
df.head()
```

```
[*****100%*****] 1 of 1 completed
```

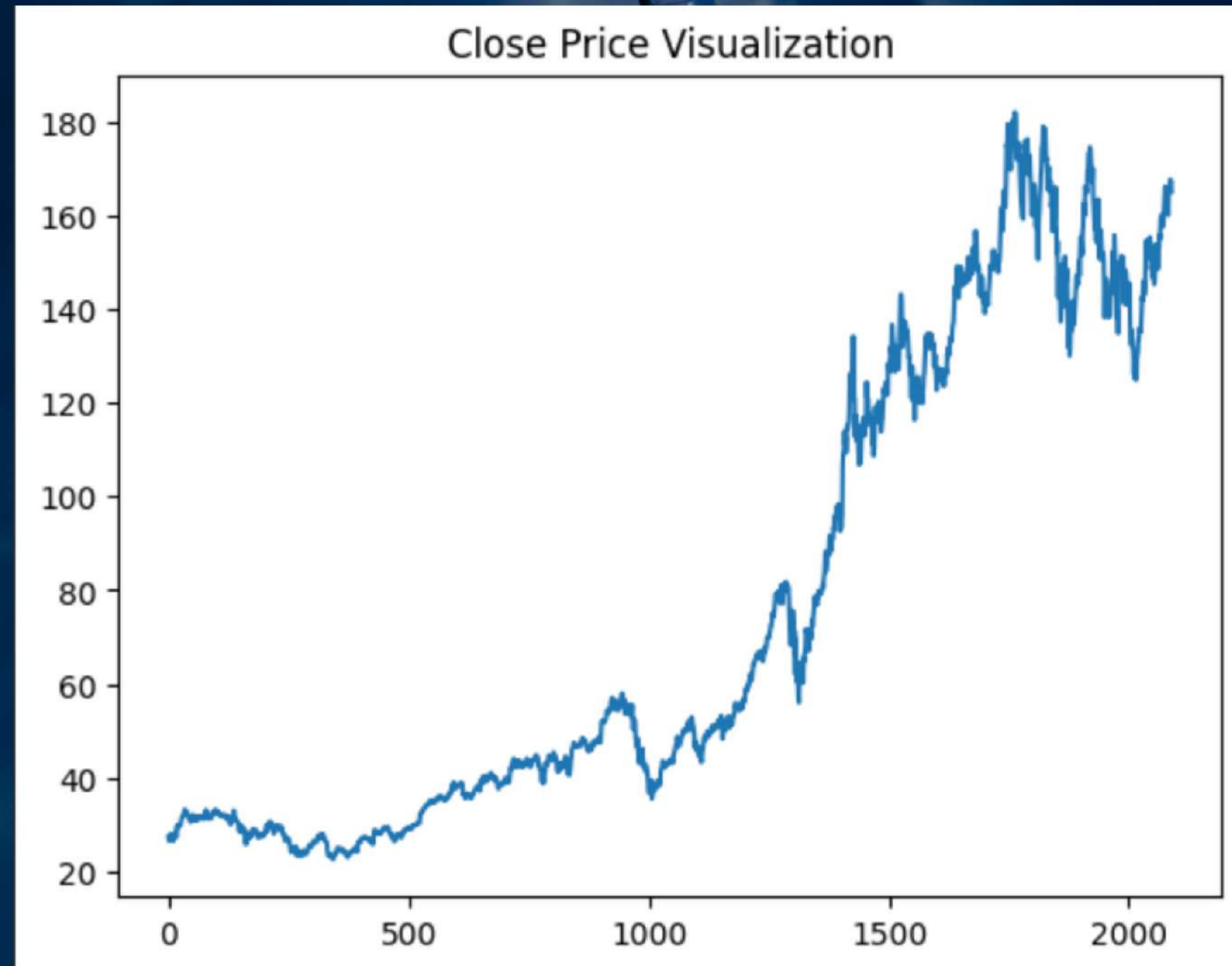
	Date	Open	High	Low	Close	Adj Close	Volume
0	2015-01-02	27.847500	27.860001	26.837500	27.332500	24.565699	212818400
1	2015-01-05	27.072500	27.162500	26.352501	26.562500	23.873646	257142000
2	2015-01-06	26.625000	26.857500	26.157500	26.565001	22.875802	262188400

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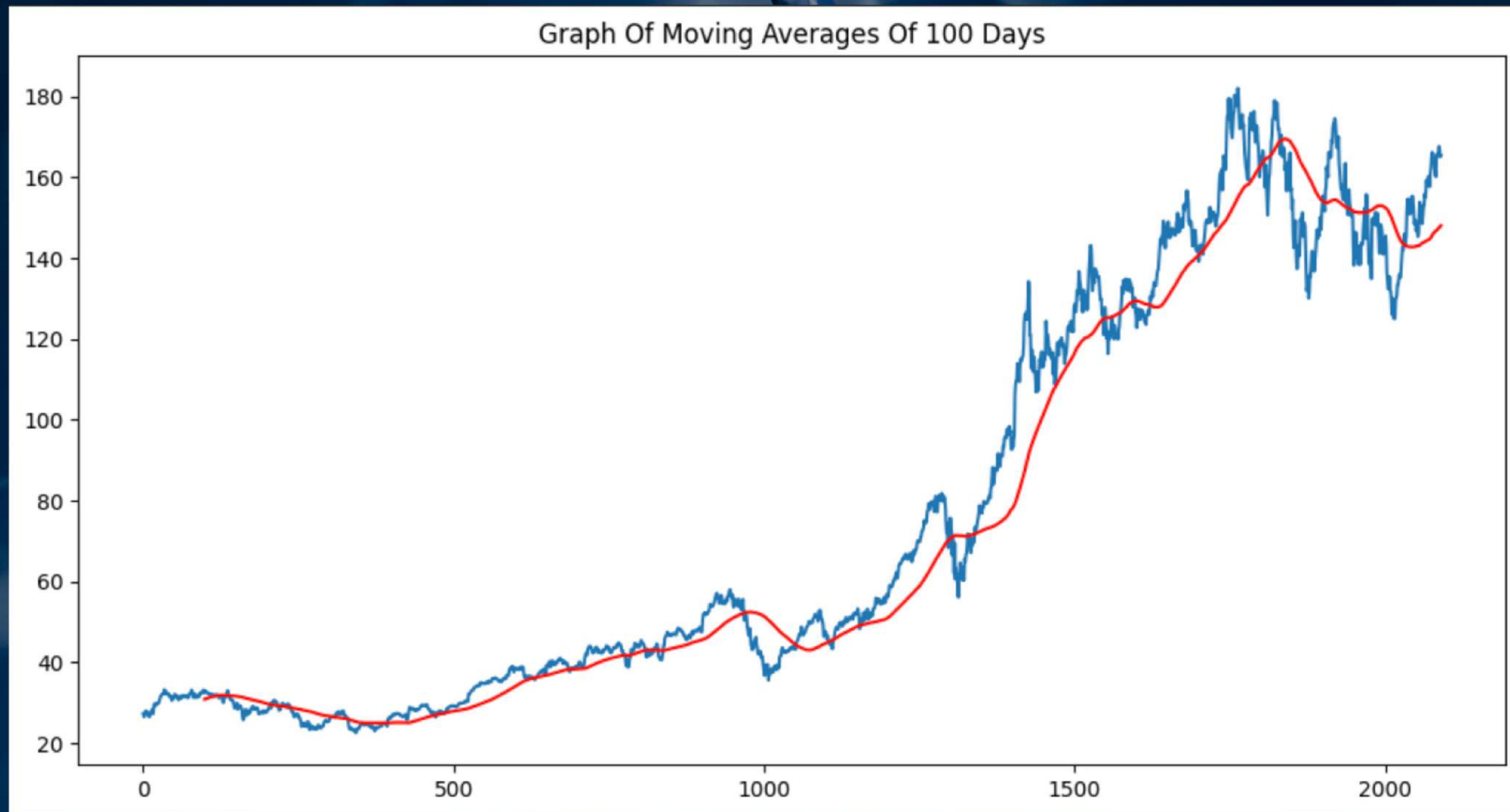


Graph Analysis

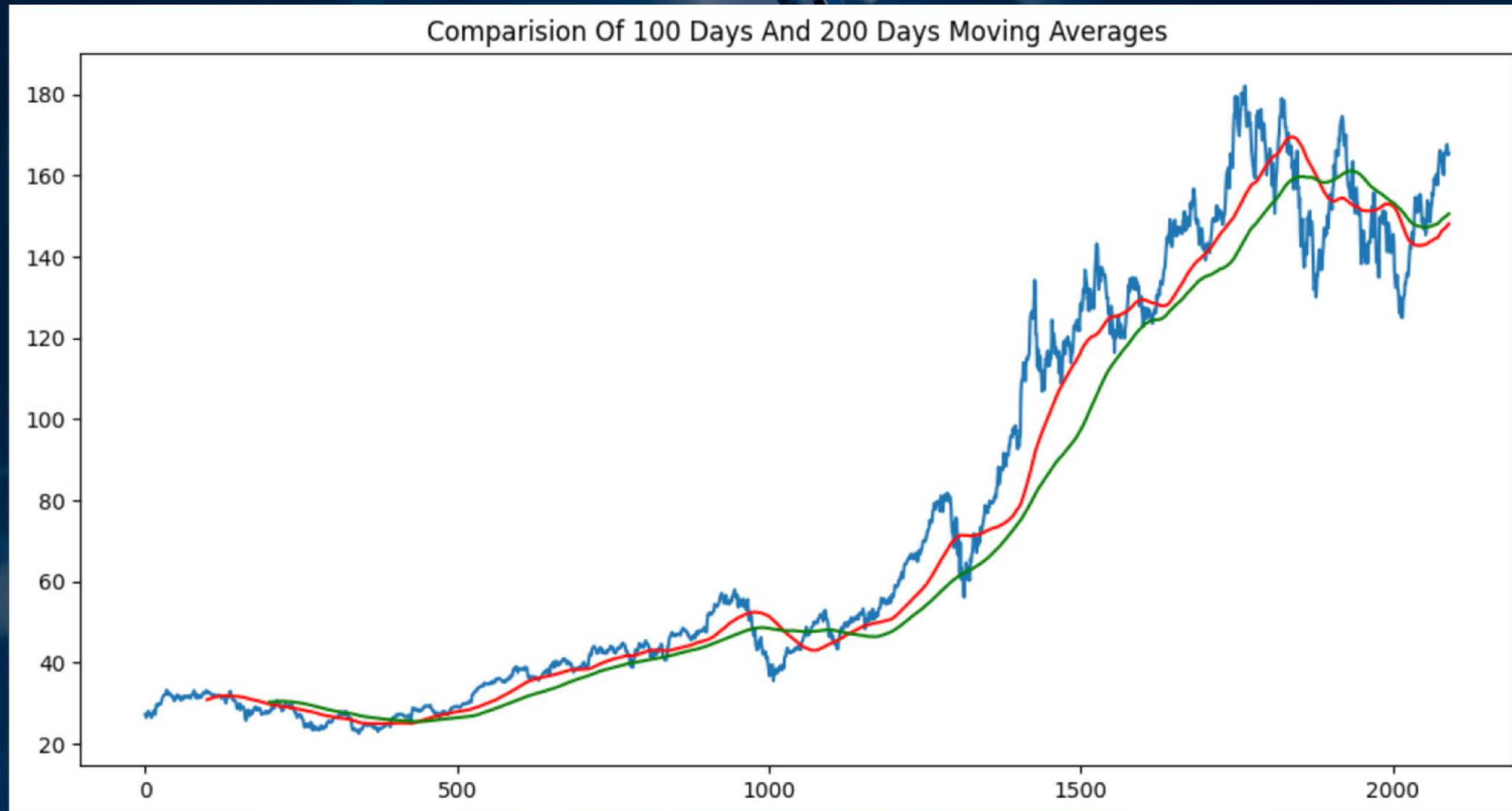
Close Price Graph Of Apple Stocks



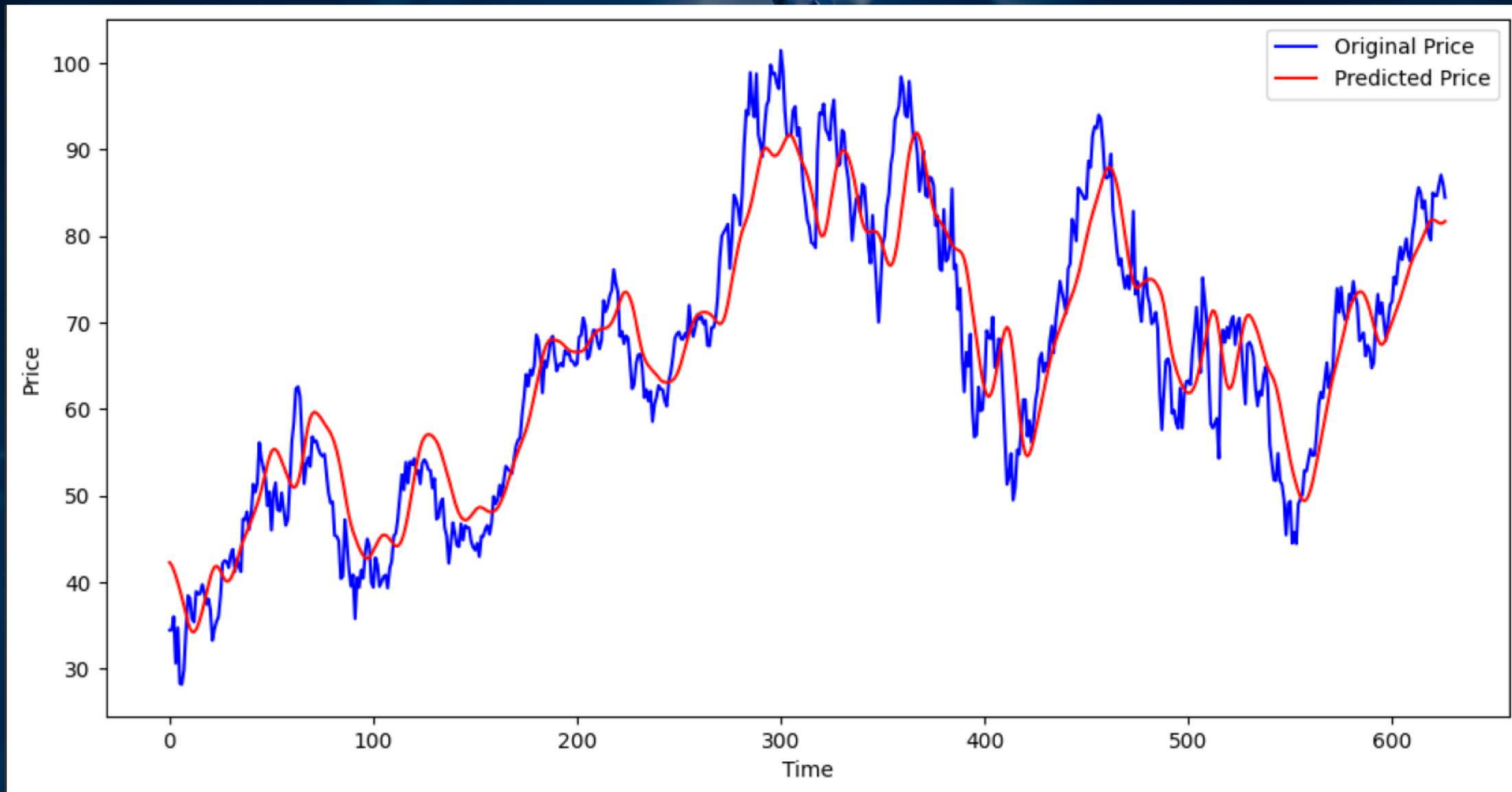
Moving Averages Graph For 100 Days




Comparision Of 100 Days And 200 Days Moving Averages






Results - Original Price Vs Predicted Price








GitHub Link






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README.md


Stock-Price-Prediction-Using-LSTM


This project is made under AI course at my college. It is bit different from just predicting stock prices, in addition to prediction it also visualizes the graph of the stocks of the company.


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