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PREDICTION OF NETFLIX STOCK PRICE DATA SETUSING LSTM MODEL

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ABSTRACT

The main goal of this study is to build a prediction model based on stacked LSTM deep learning to forecast Netflix stock values on day-closing. The "Stock ticker" characteristic is used as an input in the prediction model, which forecasts stock market closing price as a chart using a web application written in Python. Date, Open, Close, High, Low, Volume, and Adj Close are the attributes that are included in the model. Data was gathered between the years 2002 and 2022, and I separated it into two parts: a training set and a testing set. Only the testing portion is to be used for the final forecast. The closing time is then displayed against time on a graph. The results suggest that NETFLIX functions effectively. Forecasting the index may be done using machine learning techniques.

Keywords: *Stock Prediction, NETFLIX, Machine Learning, LSTM Model.*

Introduction

Stock Market

The stock market is crucial to a nation's financial system. For both enterprises and investors, it offers one of the finest investment opportunities. An Initial Public Offering (IPO) is a technique for a corporation to generate revenue while growing. The moment is right for investors to increase their stock purchases and profit from the dividends available through the company's shareholders' incentive programme. An investor can trade stocks like a trader on the stock market. To decide whether to sell, hold, or acquire additional stocks, stock brokers must anticipate the trends in market behaviour. To maximise their earnings, stock brokers and traders must buy the stocks that are predicted to expand in the near future and sell the ones that are predicted to decline. If they successfully forecast price patterns, stock traders may make spectacular gains. Therefore, forecasting future stock market patterns is crucial for stock traders' decision-making.(Khan *et al.* 2020)

Accurate stock market forecasting has become increasingly difficult in recent years. The primary indicator used to forecast the stock market is stock prices. Here, clear tactics are applied to generate a high rate of profit. One of the most important problems in finance and engineering is stock market forecasting. Academics and businesses are more interested in this area of the stock market's research because of the potential financial reward. Since it is a topic that interests them constantly, the majority of

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investors and financial experts focus on stock market predictions. Finding the optimal moment to buy or sell a company is a very difficult task for shareholders since numerous factors are important and affect price changes on the stock market. (*Budak et. al*, 2016)

The following steps were used in forecasting i.e Problem Statement, Gathering the information, Understanding the Data ,Choosing & Fitting the models, Evaluating the Performance and last step is to Forecast the future.

Materials and Methods

- **Data Collection** The Data set for Stock Price of Microsoft Corp was collected from Yahoo Finance. This Data set start from 2002 to 2022 Shown in Fig1.For the illustrated period, the data has recorded each day's Netflix stock's open price, closed price, the highest price in a day, lowest price in a day, and the corresponded transaction volume. And the data contains 5044 observations in total.

Fig. 1: Data Gathering from 2002 to 2022

	Date	Open	High	Low	Close	Adj Close	Volume
0	2002-05-23	1.156429	1.242857	1.145714	1.196429	1.196429	104790000
1	2002-05-24	1.214286	1.225000	1.197143	1.210000	1.210000	11104800
2	2002-05-28	1.213571	1.232143	1.157143	1.157143	1.157143	6609400
3	2002-05-29	1.164286	1.164286	1.085714	1.103571	1.103571	6757800
4	2002-05-30	1.107857	1.107857	1.071429	1.071429	1.071429	10154200

- **Feature Extraction** When you have a huge data set and need to conserve resources without losing any crucial or pertinent information, the feature extraction approach might be helpful. The quantity of redundant data in the data collection is decreased with the aid of feature extraction.

Fig. 2: Shows the Number of Trading Days

```
Total number of trading days: 5044
Total number of fields: 10


Null values: 0
NA values: False
```

We will choose the Open column, which indicates the stock's opening price on a given day, from the dataset. We must scale the data in order to provide the most optimal outcomes. We are using the Scikit-Learn library's MinMaxScaler() function to translate the input values between 0 and 1 for this job.

```
# Create a new dataframe with only the Open column and convert it into a NumPy array
data = data['Open'].values

# Reshape the data
data = data.reshape(-1, 1)
```

```
# Split the data into training and testing sets
dataset_train = np.array(data[:int(data.shape[0]*0.8)])
dataset_test = np.array(data[int(data.shape[0]*0.8):])
```

- **Data Selection** At this step, information from the dataset that was pertinent to the study was selected and extracted. Table 1 illustrates the nature and description of the seven (7) properties in the stock dataset.

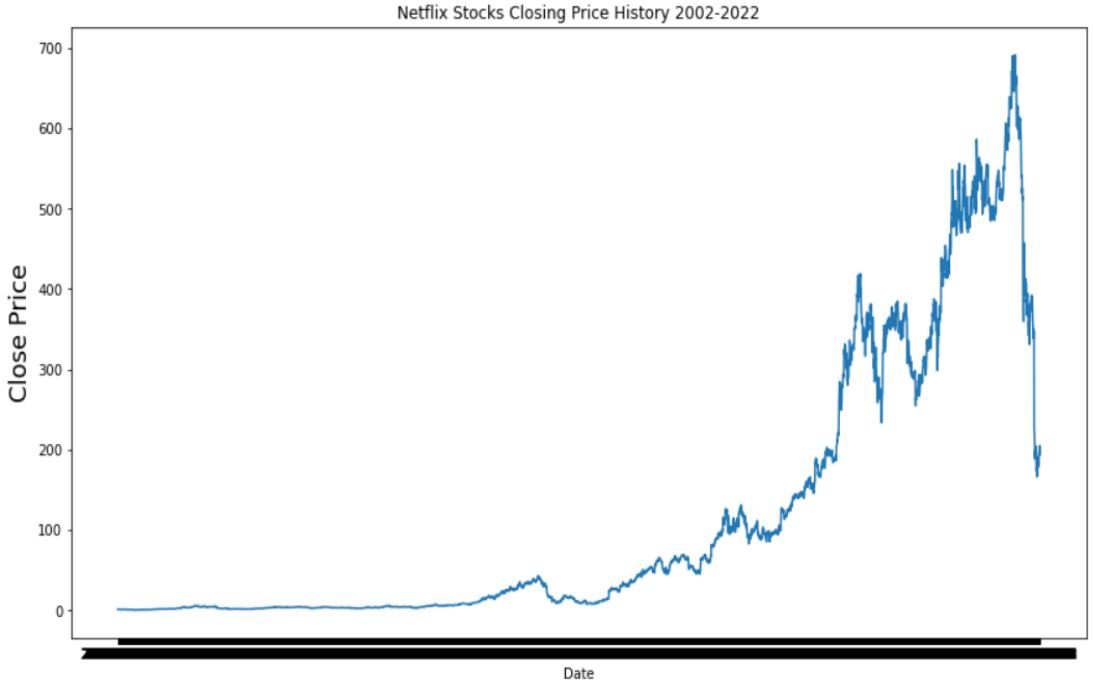
Table 1: (Kanade, P. A. (2020))

SR. NO.	Attribute	Type	Work
1	DATE	Numerical	Starting date
2	HIGH	Numerical	The high represents the price at which a stock is traded at any given time.
3	LOW	Numerical	The low is the stock's lowest trading price over a specific time period.
4	OPEN	Numerical	It is the price at which financial security first trades on a market.
5	CLOSE	Numerical	The last price at which a stock trades during an ordinary trading session is referred to as the closing price.
6	VOLUME	Numerical	Volume refers to the number of contracts traded in futures or options or shares traded in a stock.
7	ADJ. CLOSE	Numerical	The adjusted closing price amends a stock's closing price to reflect that stock's value after accounting.

With the help of drop command the Date and Adj Close columns has been dropped, that means we are using only 5columns.

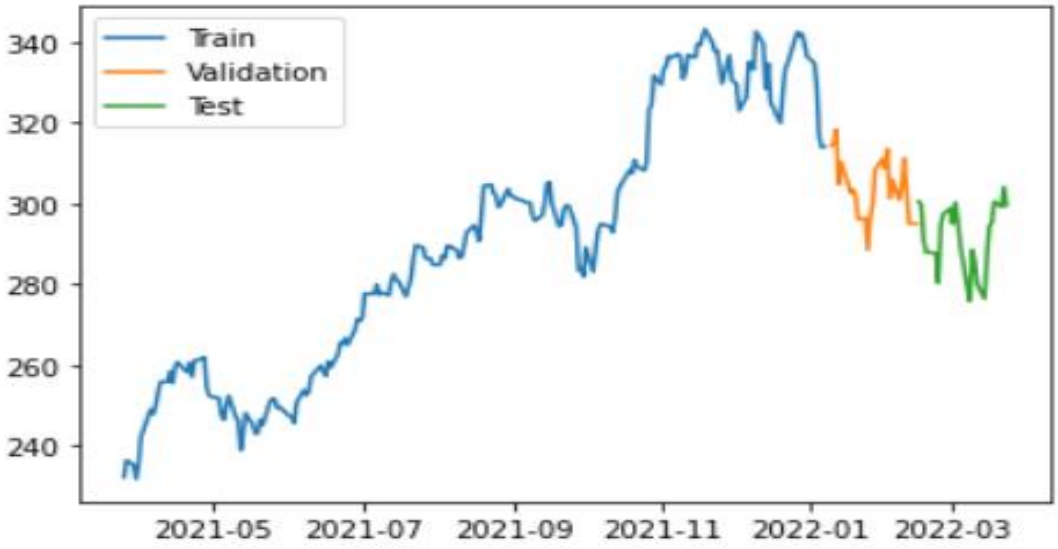
- **Data Transformation** Data consolidation is another term for this. It's the process of transforming chosen data into formats suitable for data mining. In this ,the index of date was reset as researcher want to use it as a simple column, also just drop the two columns i.e Date and Adj. close.Fig3 shows Netflix Stocks Closing Price History

Fig. 3: Stocks Closing Price History (2002-2022)



- **Data Mining Stage** Three steps made up the data mining stage. The stock datasets were analysed using all of the algorithms at each phase. Percentage splitting was used as the testing strategy in this study, which involved training on a portion of the dataset, cross-validating it, and testing on the remaining portion. After that, intriguing patterns that represented knowledge were found. Fig 5 shows splitting data into training and testing

Fig. 4: training, Testing and Validation Data

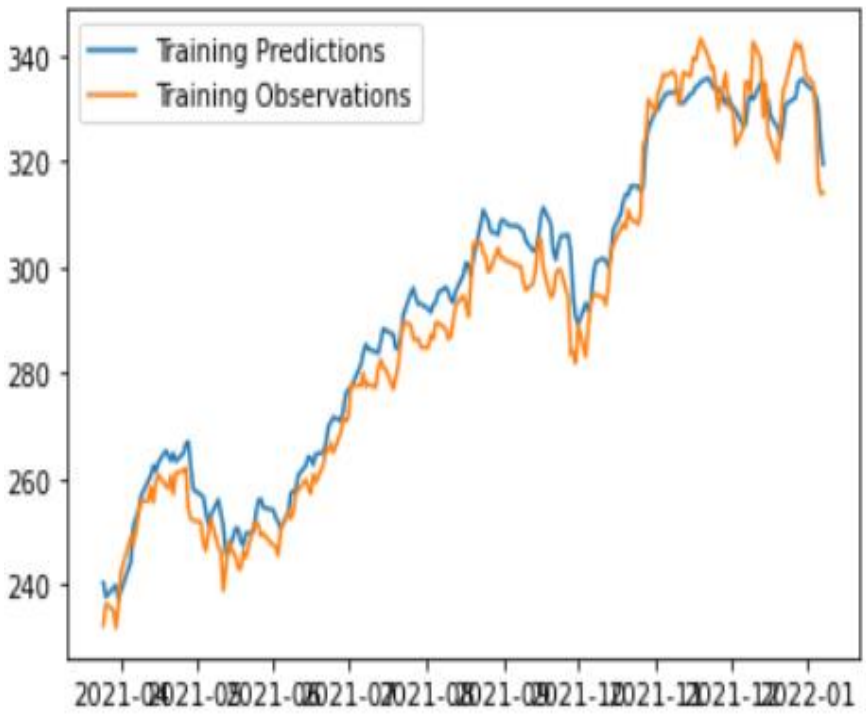


Now you can see the size of the dataset has decreased as the author divided data into 70% training data and 30% Testing Data.

Results and Discussion

In this paper, author has made a LSTM model based on training predictions and Training observations and Testing predictions and Training observations in Fig 6 Based on this model the results says are very good.

Fig. 5: LSTM Model



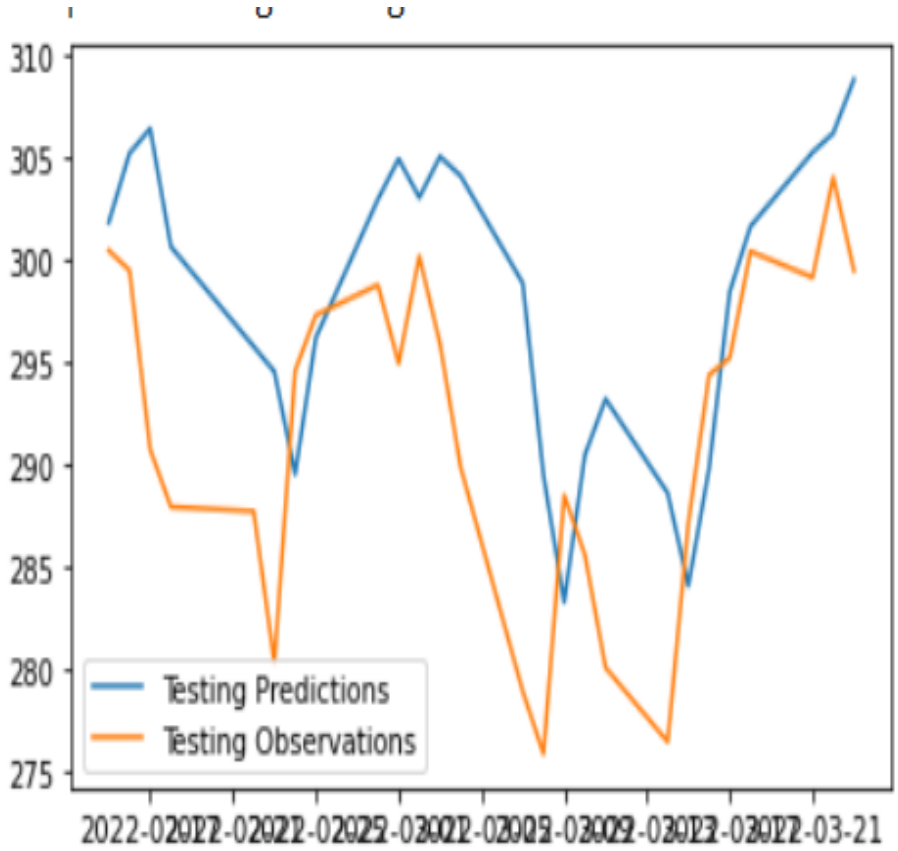
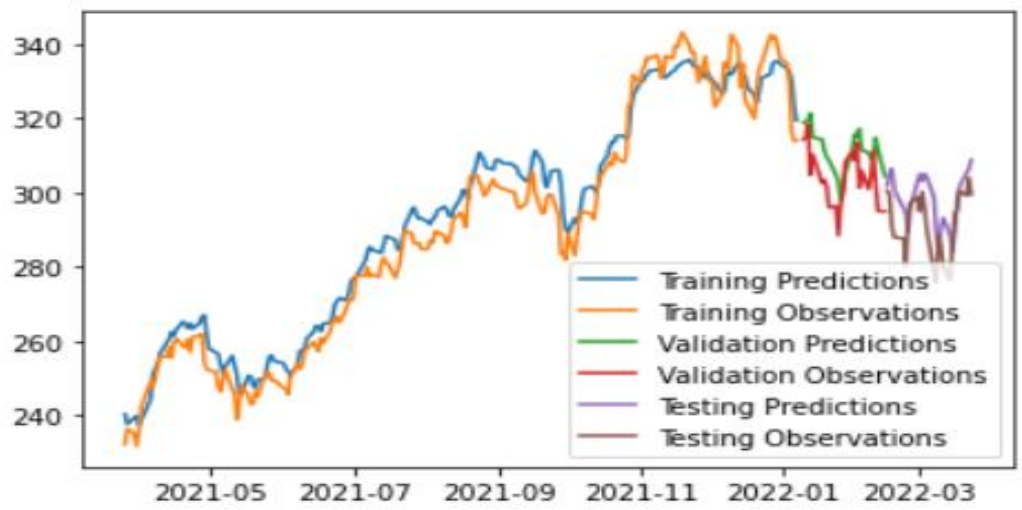


Fig. 7: Complete Predictions vs Observations



Scope of the Research

Because stock values fluctuate often and are affected by a wide range of variables that result in complicated patterns, it is challenging to predict stock market prices. By creating a web application for forecasting close stock prices using LSTM algorithms, this research predicts the closing stock price of Netflix. The key benefit of the study's scope is that it will help investors make more accurate investment predictions by giving them a better grasp of trade closing prices.

Conclusion

To forecast stock prices on the Netflix on day of closure, the author develops a prediction model based on the Stacked LSTM deep learning model. The "Stock ticker" characteristic is used as input by the prediction algorithm, which forecasts that the stock market will close. Price is shown as a Chart using a Python web application. Date, Open, Close, High, Low, Volume, and Adj Close are the attributes that are included in the model. Data was gathered between 2002 and 2022. At last Complete Predictions vs Observations are shown in this paper.

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