Stock Price Prediction Using LSTM

A Project Based Laboratory Report

in partial fulfilment for the award of the Degree of B.Tech in Computer Science

Submitted by

K.AKASH (R170178)

K. ABHISHEK KUMAR (R171068)

P.YUVA RATHNA TEJA (R170187)

PROJECT GUIDE

A.MAHENDRA

Asst.Prof. In Department of Computer Science & Engineering

AP-IIIT RGUKT RK Valley,

Vempalli, Kadapa, AP –516330,India

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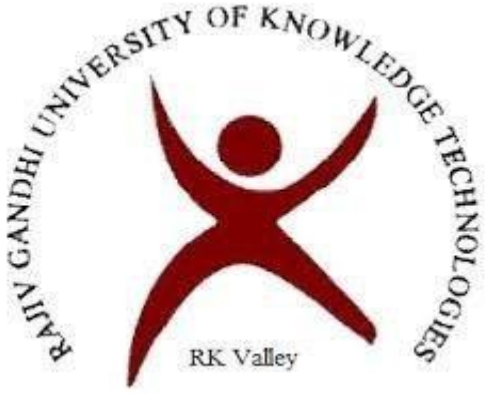
CERTIFICATE



This is to certify that the Major project entitled **"STOCK PRICE PREDICTION USING LSTM(PYTHON)"** is for the project based laboratory done by **K.ABHISHEK KUMAR, K.AKASH, P.YUVA RATHNA TEJA** bearing registration number's **R171068, R170178, R170187** is a student of B.Tech Degree during the academic year 2022-2023 in partial fulfilment for the award of B.Tech Degree From Department of Computer Science Engineering, RGUKT RK Valley

Project Guide
Mr. A. Mahendra,
Asst.Prof. in Dept of CSE,
RGUKT-RK Valley.

Head of the Department
Mr. N. Satyanandaram,
Lecturer in Dept of CSE,
RGUKT-RK Valley.

DECLARATION

We declare that the project entitled, "**STOCK PRICE PREDICTION USING LSTM(PYTHON)**" is our own work conducted under the esteemed guidance of **A.Mahdendra** at the Department of Computer Science and Engineering of RGUKT RK Valley,Idupulapaya.

STUDENT SIGNATURE'S

K.AKASH,

P.YUVA RATHNA TEJA,

K.ABHISHEK KUMAR

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Working on this Project based Lab is certainly a memorable and enjoyable event in our life. We have learned a lot of interesting new things that have broadened our view of the technology field. In here, we would like to offer our appreciation and thanks to several grateful and helpful individuals. Without them, this work could not have been completed and the experience would not be so enjoyable. We are very grateful to our esteemed Guide **A.Mahendra**, **Asst.prof.** in Department of CSE, RGUKT RK Valley, for their valuable guidance and creative suggestions that helped us to complete this Lab project. We would like to thank all those helped us directly or indirectly during this project work.

ABSTRACT

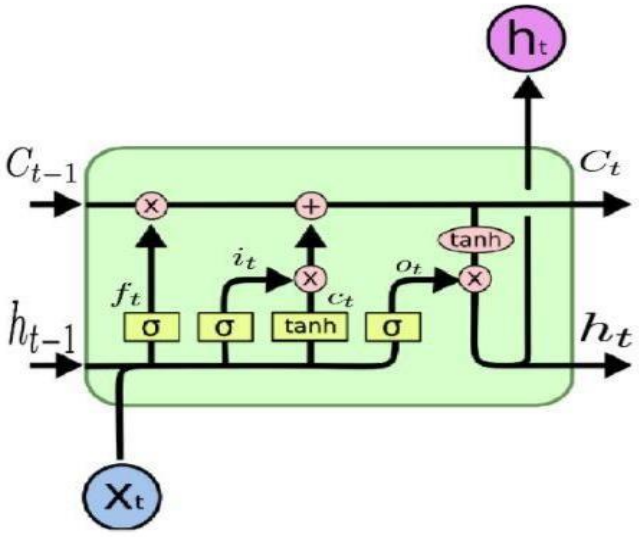
Researchers have been studying different methods to effectively predict the stock market price. Useful prediction systems allow traders to get better insights about data such as: future trends. Also, investors have a major benefit since the analysis give future conditions of the market. One such method is to use machine learning algorithms for forecasting. This project's objective is to improve the quality of output of stock market predicted by using stock value. This project proposes a different method for prognosing stock market prices. It does not fit the data to a specific model; rather we are identifying the latent dynamics existing in the data using machine learning architectures. In this work we use Machine learning architectures Long Short-Term Memory (LSTM) ,RNN etc.

OBJECTIVE

A stock market prediction is described as an action of attempting to classify the future value of the company stock or other financial investment traded on the stock exchange. The forthcoming price of a stock of the successful estimation is called the Yield significant profit. This helps you to invest wisely for making good profits.

EXPERIMENTAL METHODS :

Working of LSTM model



Long Short Term Memory is a kind of recurrent neural network. In RNN output from the last step is fed as input within the present step. It tackled the matter of long-term dependencies of RNN within which the RNN will not predict the word hold on within the long term memory however can offer additional accurate forecasts from the recent info. Because the gap length will increases RNN does not offer an economical performance. LSTM will by default retain the knowledge for a long period of time. It is used for processing, predicting and classifying on the basis of time-series data.

PROGRAM :

Reading data:

```
gstock_data = pd.read_csv('data.csv')
gstock_data .head()
```

	symbol	date	close	high	low	open	volume	adjClose	adjHigh	adjLow	adjOpen
0	GOOG	2016-06-14 00:00:00+00:00	718.27	722.47	713.1200	716.48	1306065	718.27	722.47	713.1200	716.48
1	GOOG	2016-06-15 00:00:00+00:00	718.92	722.98	717.3100	719.00	1214517	718.92	722.98	717.3100	719.00
2	GOOG	2016-06-16 00:00:00+00:00	710.36	716.65	703.2600	714.91	1982471	710.36	716.65	703.2600	714.91
3	GOOG	2016-06-17 00:00:00+00:00	691.72	708.82	688.4515	708.65	3402357	691.72	708.82	688.4515	708.65
4	GOOG	2016-06-20 00:00:00+00:00	693.71	702.48	693.4100	698.77	2082538	693.71	702.48	693.4100	698.77

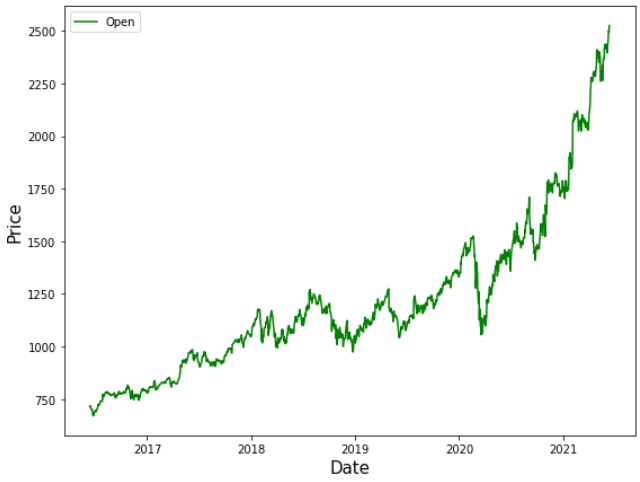
Exploring Dataset:

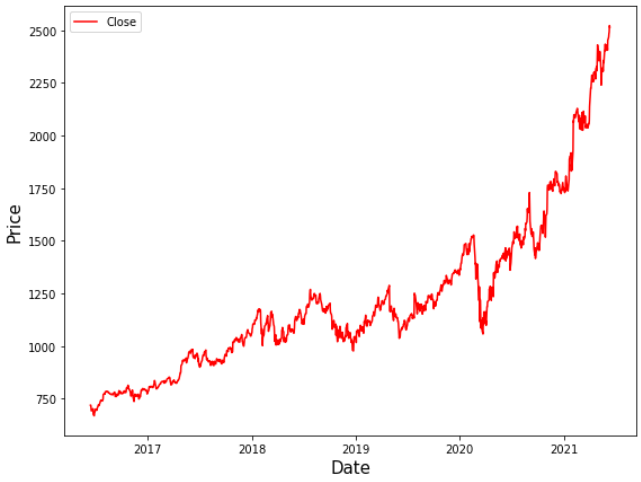
The dataset contains 14 columns associated with time series like the date and the different variables like close, high, low and volume. We will use opening and closing values for our experimentation of time series with LSTM.

```
gstock_data = gstock_data [['date','open','close']]
gstock_data ['date'] = pd.<a
onclick="parent.postMessage({'referent':'.pandas.to
_datetime'}, '*')">to_datetime(gstock_data
['date'].apply(lambda x: x.split()[0])) gstock_data
.set_index('date',drop=True,inplace=Tru e)
gstock_data .head()
```

	open	close
date		
2016-06-14	716.48	718.27
2016-06-15	719.00	718.92
2016-06-16	714.91	710.36
2016-06-17	708.65	691.72
2016-06-20	698.77	693.71

Displayed data :





Data Pre-processing:

We must pre-process this data before applying stock price using LSTM. Transform the values in our data with help of the fit_transform function. Min-max scaler is used for scaling the data so that we can

bring all the price values to a common scale. We then use 80 % data for training and the rest 20% for testing and assign them to separate variables.

```
from sklearn.preprocessing import MinMaxScaler
Ms = MinMaxScaler()
gstock_data [gstock_data .columns] =
Ms.fit_transform(gstock_data )

training_size = round(len(gstock_data ) * 0.80)

train_data = gstock_data [:training_size]
test_data  = gstock_data [training_size:]
```

Splitting data for training:

A function is created so that we can create the sequence for training and testing.

Implementation of our LSTM model:

In the next step, we create our LSTM model. In this article, we will use the Sequential model imported from Keras and required libraries are imported.

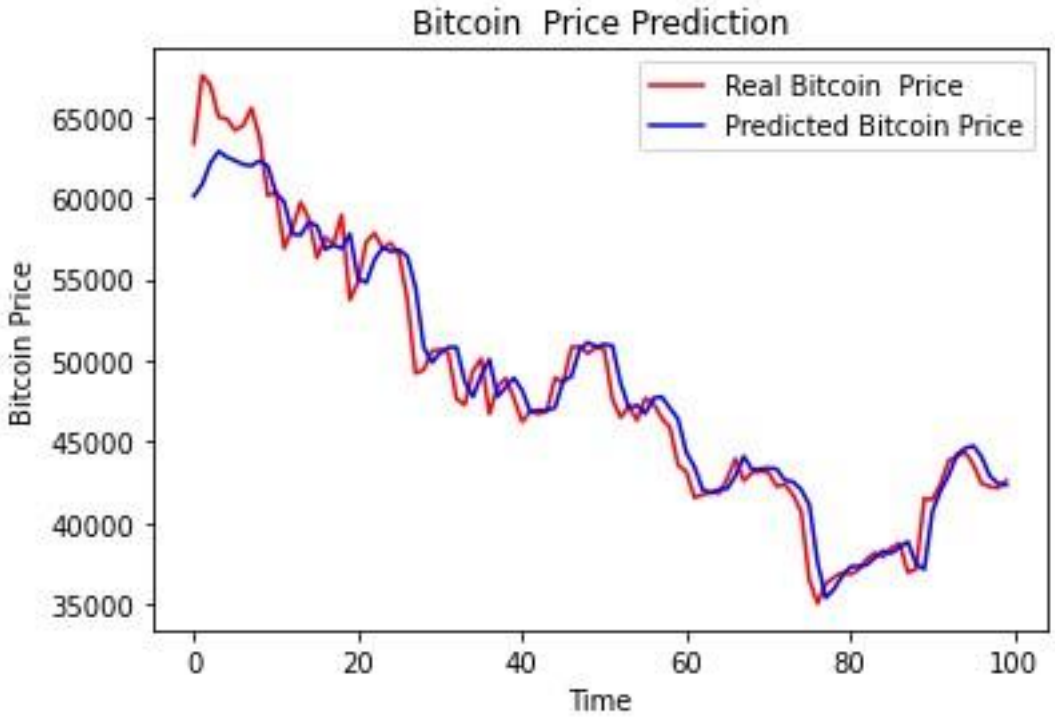
```
from keras.models import Sequential
from keras.layers import Dense, Dropout, LSTM,
Bidirectional
```

We use two LSTM layers in our model and implement drop out in between for regularization. The number of units assigned in the LSTM parameter is fifty. with a dropout of 10 %. Mean squared error

is the loss function for optimizing the problem with adam optimizer. Mean absolute error is the metric used in our LSTM network as it is associated with time-series data

RESULT :

After fitting the data with our model we use it for prediction. We must use inverse transformation to get back the original value with the transformed function. Now we can use this data to visualize the prediction



SWOT STRENGTHS:

Stock Price prediction helps us predict the stock prices of a company based on its past data. It helps people understand whether it is feasible to invest in that particular stock.

By using using the Stock Price prediction model done using LTSM we can can also see the performance of the particular stock performance in the past.

Weaknesses:

It can't consider the external factor such as political geological and accidental factor that can cause the fluctuations in the stock as it is analysed based on the past data only. Not matter how many data we collect or how precise the algorithm is, weather cannot be exact

Stock Prediction Model need a big amount of dataset so it's can learn from, more data we introduce to the system more accurate the result are.

Opportunities:

Accuracy may be better than investing without any technical skills about stock market.
It can be further improved based on adding factors like geographical political any more contemporary conditions that affect so that it can perform better.

Threats:

No matter how much data is provided it cannot be hundred percent true prediction. If decisions are made rashly based on the model prediction it may leads to invest in loss making stocks.
To perfectly integrate all factors the huge amount of data that's request cannot be executed by a normal computer, its require a super computer to execute all the algorithm in a record time, the supercomputer is very costly.

Conclusion:

we are predicting the closing stock price of any given organization, we have developed an application for predicting close stock price using LSTM algorithm. We have used datasets belonging to Google, and achieved above 93% accuracy for these datasets. In the future, we can extend this application for predicting cryptocurrency trading and also, we can add sentiment analysis for better predictions.

Reference:

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2.Jordan, Michael I., and Tom M. Mitchell. "Machine learning: Trends, perspectives, and prospects." Science 349, no. 6245 (2015):