Stock Market Prediction

Submitted in partial fulfilment of the requirements

of the degree of

Bachelor of Engineering in

Information Technology

by

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45 Pushkar Mavale

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under the guidance of

Supervisor (s):

Mrs. Asha Bharambe

Department of Information Technology

Vivekanand Education Society's Institute of Technology

2021-2022

Vivekanand Education Society's

Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

Department of Information Technology

CERTIFICATE

This is to certify that **Rohit Karalkar, Pushkar Mavale and Himanshu Mishra** of Third Year Information Technology studying under the University of Mumbai have satisfactorily presented the Mini Project entitled Stock Market Prediction as a part of the MINI-PROJECT for Semester-VI under the guidance of **Mrs. Asha Bharambe** in the year 2021-2022.

Date: 20-04-2022

Mrs. Shalu Chopra
Head of Department

Mrs. Asha Bharambe
Supervisor/Guide

Vivekanand Education Society's

Institute of Technology

(Affiliated to University of Mumbai, Approved by AICTE & Recognized by Govt. of Maharashtra)

Department of Information Technology

DECLARATION

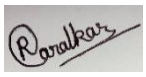
We, **Rohit Karalkar, Pushkar Mavale and Himanshu Mishra** from **class D15A**, declare that this project represents our ideas in our own words without plagiarism and wherever others' ideas or words have been included, we have adequately cited and referenced the original sources.

We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our project work.

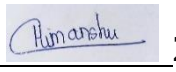
We declare that we have maintained a minimum 75% attendance, as per the University of Mumbai norms.

We understand that any violation of the above will be cause for disciplinary action by the Institute.

Yours Faithfully

1._Rohit Karalkar  20-04-2022___

2._Pushkar Mavale  20-04-2022_

3. _Himanshu Mishra  20-04-2022_

(Name & Signature of Students with Date)

Acknowledgement

We have taken efforts in this project. However, it would not have been possible without the kind support and help from many individuals. I would like to extend my sincere thanks to all of them. I also would like to express my gratitude towards our respected professors in the university who have given me an opportunity to take this project and also provide me with the knowledge to successfully complete it. My thanks and appreciations also go to my colleagues in developing the project and people who have willingly helped me out with their abilities

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1. INTRODUCTION:

Stock Market refers to the market where exchange of stocks take place. In 2019-20 financial year there were 4.09 crore stock investors, the number increased to 5.5 crore in 2020-21 and 7.3 crore in 2021-22. As the pandemic hit our lives, people realized importance of saving as well as investing their money to get the maximum returns.

Stock market is one of the major fields that investors are dedicated to, thus stock market price trend prediction is always a hot topic for researchers from both financial and technical domains

2. PROBLEM STATEMENT:

The stock market appears in the news every day. We hear about it every time it reaches a new high or a new low.

The problem here is lack of awareness of technology among local retailers in the stock exchanges which could have helped them to gain the maximum return on their investment.

The rate of investment and business opportunities in the Stock Market can increase if an efficient algorithm could be devised to predict the short-term price of an individual stock.

3. Objectives:

To facilitate the predictions of stock market for every-day use.
We also give the option to get prediction of next 30-100 days.
We also give a visualised plot of how stock rose or fall in past days.

4. Scope:

As of now we want to host our website and test it with real people.

We would love to improve our website based on user interaction.

We want to make our website accurate enough to give users a fair analysis of how stock rises in past days and how it is expected to behave in upcoming days depending upon its past performance.

5. LITERATURE SURVEY:

1) An efficient stock market prediction model using hybrid feature reduction method based on variational autoencoders and recursive feature elimination, Hakan Gunduz [1], [2]

Hourly price data of eight banking stocks listed in the BIST 30 Index were used in this study. Price data included hourly open, close, and high and low prices.

In this study, different types of ML models, such as Support Vector Machines, LightGBM, and Long-Short Term Memory are employed to classify the directions of the stock movements.

2) Hourly Stock Market Prediction Using Machine Learning Techniques: A Decade Survey on Methodologies, Recent Developments, and Future Directions – Nusrat Rouf, Majid Bashir Malik, Tasleem Arif, Sparsh Sharma, Saurabh Singh, Satyabrata Aich and Hee - Cheol Kim [1], [2]

In this study, different types of ML models, such as Artificial Neural Networks (ANN), Support Vector Machine (SVM), Naïve Bayes (NB), Genetic Algorithms (GA) are employed to classify the directions of the stock movements.

They have explained the performance of various algorithms for predicting the stock prices. They have used SMP model for prediction.

6. Proposed Solutions:

To get the insights from the stock data and predict the possible future returns on the stock using ML.

Will make use of LSTM model which is used to predict future values based on previously observed values.

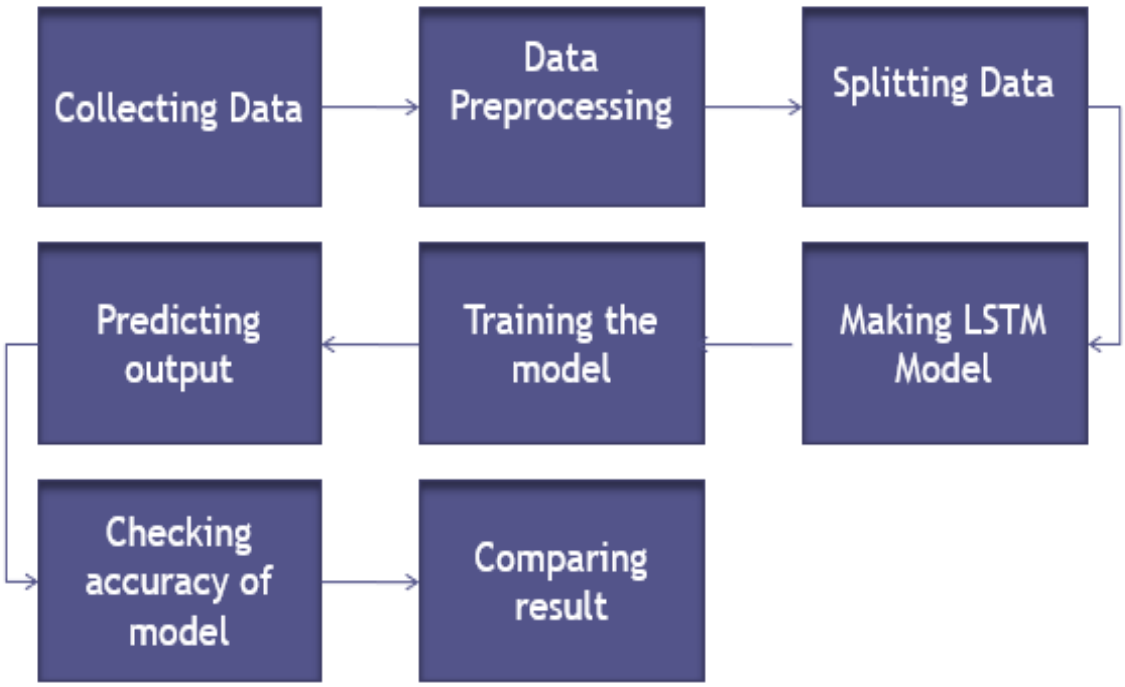
Our main objective is to build a prediction model for price trend prediction, which focuses on short-term price trend prediction.

7. LSTM Model

A Long Short Term Memory Network (LSTM) consists of four different gates for different purposes as described below :

1. **Forget Gate(f)**: It determines to what extent to forget the previous data.
2. **Input Gate(i):** It determines the extent of information be written onto the Internal Cell State.
3. **Input Modulation Gate(g):** It is often considered as a sub-part of the input gate and much literature on LSTM's does not even mention it and assume it is inside the Input gate. It is used to modulate the information that the Input gate will write onto the Internal State Cell by adding non-linearity to the information and making the information Zero-mean.
4. **Output Gate(o):** It determines what output(next Hidden State) to generate from the current Internal Cell State.

8. Design of the proposed system:



Collecting data- Our initial data was it the form of csv file containing data of past months on how our selected bank's stocks have behaved

Data Pre-Processing- We pre-processed data removing some redundant fields or empty columns

Splitting data- We split the data into training and testing set.

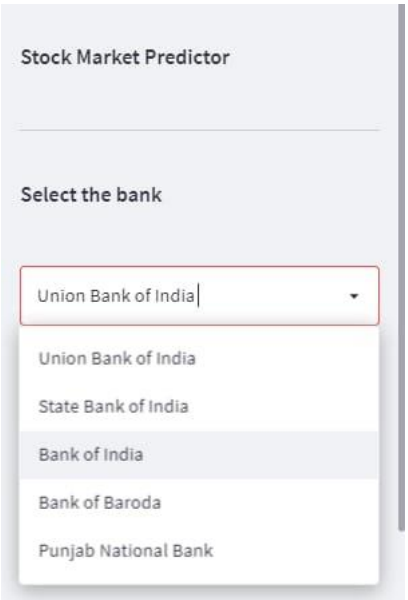
LSTM model- We passes the training dataset into LSTM model to train it

Predicting the output- After training we predicted the output on some dummy data as well as our testing datasets

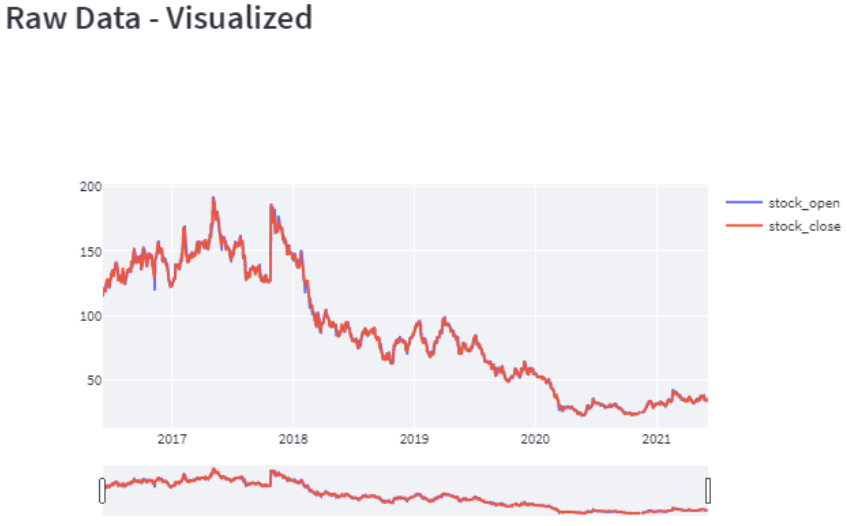
Accuracy- Depending upon the results our algorithm gave on testing dataset we determined the accuracy of our algorithm

9. Result and Conclusion

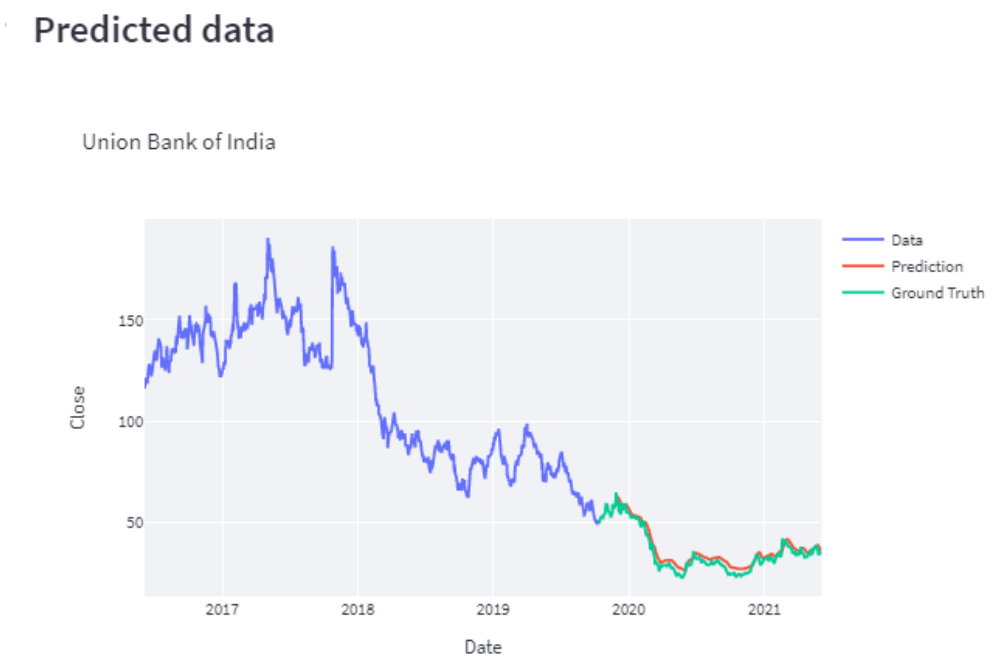
Selecting the bank



Previous data plotted



Predicted data along with actual changes



Predicted data

We have used previous datasets of some of the banks to train them and predicted based on how values have risen or fallen since past days. The prediction varies from 30 days to up-to 100 days.

10. Conclusion and Future Work:

We would like to increase the accuracy of our app and make UI more user friendly giving them real time analysis of how stock rises or falls. We also plan to give them option to buy or sell the stocks on fly.

11. References:

An efficient stock market prediction model using hybrid feature reduction method based on variational autoencoders and recursive feature elimination, Hakan Gunduz

A Decade Survey on Methodologies, Recent Developments, and Future Directions – Nusrat Rouf, Majid Bashir Malik, Tasleem Arif, Sparsh Sharma, Saurabh Singh, Satyabrata Aich and Hee - Cheol Kim

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