Stock Market Price Prediction using Machine Learning

Omkar Shirke
Student, Department of Information Technology
Palghar, India

Anita Chaudhari
Assistant Professor
Department of Information Technology
Palghar, India

Devarshi Tandel
Student, Department of Information Technology
Palghar, India

Smiti Bari
Student, Department of Information Technology
Palghar, India

ABSTRACT
Stock exchange is amongst the most important actions in the commercial world. The act of trying to predict the upcoming price of a stock or additional economic tool traded on a commercial conversation is recognized as stock market prediction. The large percentage of stock traders utilize practical and important analysis, and also time series analysis, while making stock estimates. Python is the programming language used to use machine learning to predict the stock market. In this paper, we propose a Machine Learning (ML) approach that will be trained utilizing offered to the public stock statistics to figure intellect, and then use that intelligence to produce an true prediction.

Keywords
Stock market prediction; Long Short-Term Memory; Liner Regression; Machine Learning

1. INTRODUCTION
Financial markets are complicated, quickly marketplaces that have a significant effect on the global economy. On financial stock markets, macroeconomic variables such as government, natural catastrophes, artificial disasters, marketplace mind, and other direct elements such as supply and request, conjecture, and anticipation have a massive result. Since globalization and financial market integration have added to the complexity it is difficult to predict stock market actions using simply theory. As an outcome, the foreign factors said above should be measured.

Stock marketplace forecasting has been a popular subject among academics for the past two decades. Scholars have preferred to use web properties to forecast stock marketplace actions as computational supremacy and the accessibility of big data has increased. Stock market activity may be predicted with machine learning and natural language dispensation methods. Text, videos, photographs, and other types of financial data are all acceptable. Written data was mined from web broadcast, search engine enquiries, and social mass media by the majority of the researchers. The software we provide here predicts the stock return price of 30 Dow Jones Industrial Average (DJIA) directory firms. For the stock value return estimate algorithm, we employ Twitter sentimentality examination, online news text examination, search engine interrogation hits, past stock prices, and different machine learning techniques to evaluate the accuracy using real stock market data.

There is a solid option of identifying stock arrival prices since earlier studies identified a link between stock marketplace information and the aforementioned data bases. These estimated values may be used to get upcoming insight into how the marketplace disturbs a company's economic health and to make economic decisions that save lots of bucks.

2. LITERATURE REVIEW
This paper makes an effort to predict future values of a business's stock with greater accuracy using LSTM model in machine learning. The implementation of the innovative LSTM Model as a technique of estimating stock prices is the researchers' key contribution. The accuracy of prediction can be increased in the future by using a much larger dataset than the one now used[1].The accuracy for LR predictions on classification data indicates that when PCA is functional to the data to help the forecast job, the accuracy is much better. SVM has a high correctness on non-linear sorting data, however LR is favored if the offered model is regression since it has high sureness worth[2].

The aim of this article is to help stock brokers and investors in making stock market investment. This paper examines a well-known regression approach for predicting stock price. The outcomes of a multiple regression technique might be enhanced in the future by employing a larger number of variables[3].The importance of sentiment analysis in this paper is extremely important. If properly done, it can raise accuracy to 90 %, but if there is even a small error, it can decrease accuracy to 60 %. Beta rate for stock marketplace data will be provided for characteristic feed in in future studies[4].

In this study, they present a method that provides two distinct categories of price forecast founded on past and real-time information along with broadcast study, to help investors make better choices. LSTM uses the most up-to-date trade data and analysis tools as its input[7].This research gives an overview of multiple stock market prediction algorithms, their parameters, and datasets. The aim of this analysis is to compare traditional, machine, and deep learning methods in order to assist researchers in their further research[8].

They explore work on controlled machine learning models in stock market forecasting in this study. The study that looked at how controlled machine learning techniques can be worn to better stock marketplace predictive accuracy[9].This review presents an summary of ML applications in stock market forecasting to understand what can be complete in the future.

They apply sentiment analysis and mathematical indicators in this study, which are two efficient methods for successfully analyzing data[10].The purpose of this study is on utilizing LSTM and Recurrent Neural Networks (RNN) to forecast stock prices on NSE information using different criteria such as present market value. on select a company for the LSTM and RNN machine learning model The model's performance is shown by associating the company data to the forecasted data using an RNN graph.[11].

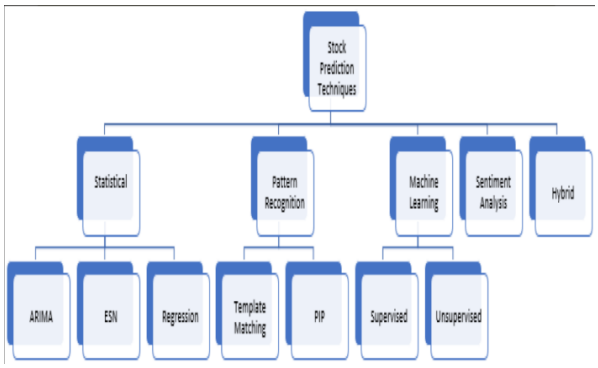

Figure 1.Stock market prediction techniques

The above figure(figure1) shows different stock market prediction techniques like statistical, pattern recognition, Machine Learning, Sentiment Analysis, Hybrid. In our model we have used Unsupervised Machine Learning Approach.[5] The quality of the several ML models was equated and studied, and the stock value and motion of the Apple stock dataset were forecast. The Logistic Regression Model is use and provided a extreme mean accuracy of 68.622%[6].

3. Block diagram:

By importing the required libraries, the live data is loaded using pandas datareader. The data is tested and trained. Then we feature the scaling, which is accomplished by subtracting the min value from the feature and then dividing by the range using Min-Maxscaler. Getting the inputs and outputs is the next step, following with reshaping. We add input and LSTM LAYER after implementing the model. The Model is then put altogether. After compilation, the dataset's real stock price and predicted stock price are derived (which is the result). Using matplotlib and see the results in a graph form pyplot as plt . Regression includes reducing error in a linear way.

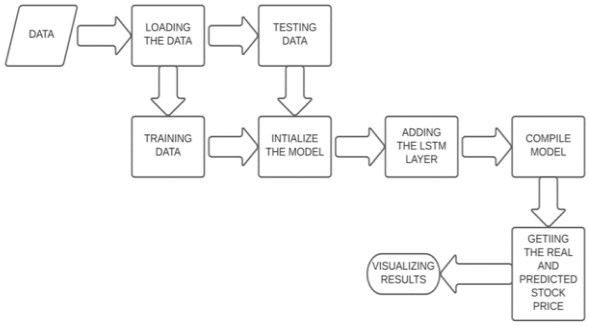

Figure 2.Proposed Methodology

Long Short-Term Memory (LSTM): Helps in the long-term memory of data and results. Finally, graphs show price changes that occur (in the event of regression) based model including the difference in price between the actual and predicted price (for the LSTM based model) are compiled.

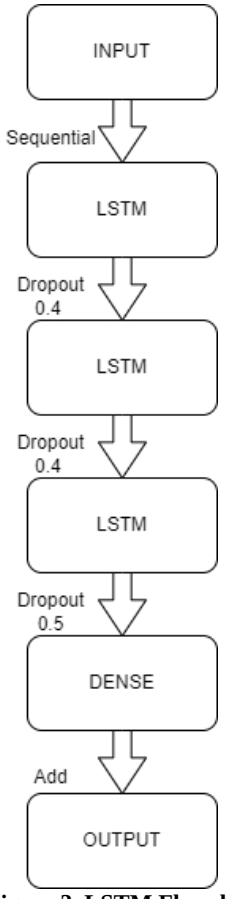

Figure 3. LSTM Flowchart

Steps: -

1. Sequential for initializing the neural network
2. LSTM for adding a layer of Long Short Term Memory
3. Dropout for avoiding overflow by adding dropout layers.
4. Dense allows you to add a densely coupled neural network layer to your model.

We had executed our work on I3 , 10th Generation CPU,UHD graphics card, Windows 10, 16Gb RAM

Dataset used:

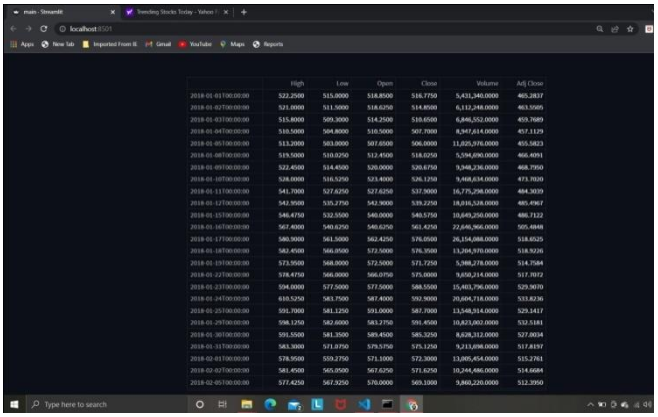

Figure 4. Dataset of Stock "TCS.NS"

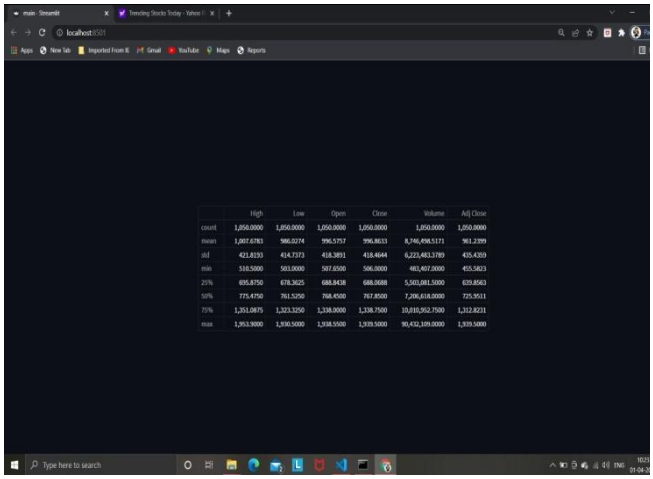

Figure 5. Dataset of Stock "TCS.NS"

In figure 4 and 5, Here we have collected Dataset of Stock "TCS.NS" of last 10 years from Yahoo Finance which has some constraints like All time high value, all time low value, current value, volume of stock, closing value, etc.

4. RESULTS

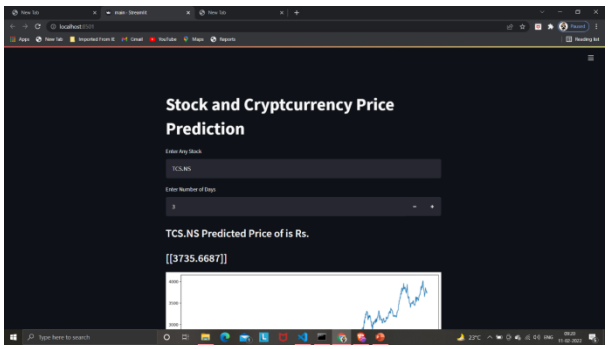

Figure 6. Predicted price of Stock "TCS.NS"

In the figure(6), we have created a text input option using st.input() which is in streamlit library. Also we have added a integer input option using streamlit library, which gives error if null or 0 is selected. After selecting desired stock name and number of days, press enter button to get the predicted price.

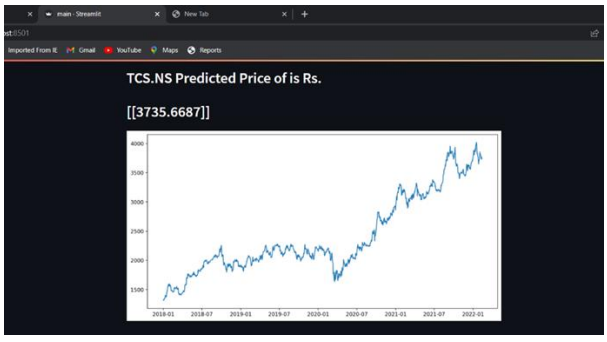

Figure 7. Predicted graph of Stock "TCS.NS"

In figure (7), we have selected the stock name ("TCS.NS") and future prediction days. After this our prediction model runs and gives the desired output i.e. predicted price of "TCS.NS" (figure5) and the respective graph of the stock as well.

5. CONCLUSION

We proposed in the research that we integrate data from many global economic markets with ML algorithms to anticipate stock index actions. The algorithm is based on a big dataset containing data collected from various global financial markets. For predicting the daily trend of Market stocks, various machine learning-based algorithms have indeed been proposed. Our well-trained predictor has been used to create practical trading models.

6. REFERENCES

[1] Parmar, Ishita, Navanshu Agarwal, Sheirsh Saxena, Ridam Arora, Shikhin Gupta, Himanshu Dhiman and Lokesh Chouhan,"Stock Market Prediction Using Machine Learning" ,2018 ,First International Conference on Secure Cyber Computing and Communication (ICSCCC) ,574-576.

[2] MeghnaMisra, Ajay Yadav and Harkiran Kaur,"Stock Market Prediction using Machine Learning Algorithms: A Classification Study", 2018, International Conference on Recent Innovation in Electrical, Electronics & Communication Engineering - (ICRIEECE), 2475-2478.

[3] Ashish Sharma, Dinesh Bhuriya and Upendra Singh, "Survey of Stock Market Prediction Using Machine Learning Approach", 2017, International Conference on Electronics, Communication and Aerospace Technology ICECA, 506-509.

[4] NaadunSirimevan, I.G.U.H. Mamalgaha, Chandira Jayasekara, Y.S. Mayuran, and Chandimal Jayawardena, "Stock Market Prediction Using Machine Learning Techniques", 2019, International Conference on Advancements in Computing(ICAC), 192-197.

[5] EV Shah ,Haruna Isah andFarhana Zulkernine, "Stock Market Analysis: A Review and Taxonomy of Prediction Techniques", 2019.

[6] Srinath Ravikumar and Prasad Saraf, "Prediction of Stock Prices using Machine Learning (Regression, Classification) Algorithms", 2020, International Conference for Emerging Technology (INCET), 1-5.

[7] Sumeet Sarode, Harsha G. Tolani, Prateek Kak, and Lifna C S, "Stock Price Prediction Using Machine Learning Techniques", 2019, International Conference on Intelligent Sustainable Systems (ICISS), 177-181.

[8] Rachna Sable, Dr. Shivani Goel, and Dr.Pradeep Chatterjee, " Empirical Study on Stock Market Prediction Using Machine Learning", 2019, International Conference on Advances in Computing, Communication and Control (ICAC3).

[9] Zaharaddeen Lawal, Hayati Yassin and Rufai Zakari, "`Stock Market Prediction using Supervised Machine Learning Techniques: An Overview", 2020, IEEE Asia-Pacific Conference on Computer Science and Data Engineering (CSDE).

[10] Parag Kadu, and Dr. G. R. Bamnote, "Comparative Study of Stock Price Prediction using Machine Learning", 2021, Proceedings of the 6th International Confeence on Communication and Electronics Systems (ICCES), 1200-1204.

[11] Jeevan B, Naresh E, Vijaya Kumar B P, Prashanth kambli, "Share Price Prediction using Machine Learning Technique", 2018, IEEE Third International Conference

on Circuits, Control, Communication and Computing.

[12] A. Pavate, A. Chaudhary, P. Nerurkar, P. Mishra and M. Shah, "Cuisine Recommendation, Classification and Review Analysis using Supervised Learning," 2020 International Conference on Convergence to Digital World - Quo Vadis (ICCDW), 2020, pp. 1-6.