IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

StockSight: Insightful Predictions for Strategic Investments

Aishwarya K[1] and Dr. Chitra K[2]
Student MCA, IVth Semester[1]
Associate Professor, Department of MCA[2]
Dayananda Sagar Academy of Technology and Management, Udaypura, Bangalore, Karnataka, India
aishwaryayk777@gmail.com and chitra-mca@dsatm.edu.in

Abstract: *Analysts have been examining different strategies to viably anticipate stock advertise costs. Valuable expectation frameworks give dealers with way better experiences into future patterns, profiting speculators by analyzing future showcase conditions. This project's primary objective is to realize superior exactness in forecasts compared to past models utilizing distinctive machine learning calculations. In this work, we employ three machine learning algorithms: Random Forest, LSTM, and Decision Tree Regressor. We also use four evaluation metrics: R Squared Error, MAE, MSE, and RMSE, to predict the stock prices of JPX Tokyo Stock Exchange and ITC Limited, and to compare their accuracy. The JPX Tokyo Stock Exchange and ITC Limited stock price data were downloaded from the Kaggle website. The dataset attributes include Date, Open, High, Low, Close, Adj Close, and Volume. The full source code of the project was written in Python. It is hypothesized that the LSTM model provides more accurate predictions than the Random Forest and Decision Tree Regressor for Tokyo stock data, while Random Forest offers more accurate predictions than LSTM and Decision Tree Regressor for ITC Limited stock data.*

Keywords: Machine Learning, Python, Random Forest Regressor, LSTM, Decision Tree Regressor, R Squared Error, RMSE, MSE, MAE

I. INTRODUCTION

The stock advertise envelops the different trades and scenes where offers of freely held companies are bought, sold, and issued. It serves as the commercial center for exchanging offers of freely recorded companies. Estimating stock costs could be a challenging try due to the unstable nature of the showcase. Stock costs are in steady flux, making precise forecasts troublesome. A stock speaks to a share in a company's possession. Stocks signify fractional proprietorship of a commerce instead of fair a stock ticker or a chunk of paper and can be exchanged within the stock advertise. In the event that a company's possession is partitioned into 100 parts and an financial specialist buys one portion, they claim one percent of that company.

Quantitative traders, often with substantial capital, buy stock derivatives and equities at low prices and later sell them at higher prices. Predicting stock market trends is not a new concept and continues to be a topic of discussion among various organizations. Machine learning algorithms are extensively used by many organizations for stock market prediction. The stock market facilitates the seamless buying and selling of company stocks. Each stock exchange has its own index value, which is calculated by averaging several stocks. This index helps represent the overall market and predict its movements over time. The stock market can significantly impact individuals and the economy as a whole. Therefore, accurately predicting stock trends can minimize risk and maximize profits.

II. LITERATURE SURVEY

Abhinit Davane et al, aims to predict future stock values using machine learning techniques that rely on current stock market indices and historical data for training. Python is the chosen programming language for building these predictive models. This study evaluates how well Decision Tree and LSTM models forecast stock prices, analysing factors like open, low, close, high, and volume from datasets such as Tingo or Yahoo. Both methods have demonstrated enhanced accuracy in predicting stock trends, yielding promising findings [1].

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

Vignesh C K predicted the future value of stocks or other financial instruments traded on stock exchanges. Such predictions are crucial for making informed financial and investment decisions. Machine learning techniques, trained on historical data, play a key role in these calculations by identifying trends to forecast future outcomes. The primary focus of this study is to compare and analyze the effectiveness of SVM and LSTM algorithms in predicting stock market trends [2].

Shreya Pawaskar says stock price has examined the Information Set with 7 qualities (Date, Open, Tall, Moo, Near, Volume, Adj near) and makes a forecast utilizing diverse regressors to discover end of the cost. It can be seen that the most noteworthy precision is gotten utilizing the Choice Tree Regressor show with the R^2 blunder being 1.0 and the RMSE being 0.0. This paper concluded that the Choice Tree Regressor gave the leading comes about out of all the models utilized for the stock cost forecast [3].

Adil Moghar et al aims to build a model using Recurrent Neural Networks (RNN) and especially Long- Short Term Memory model (LSTM) to predict future stock market values. The main objective of this paper is to see in what precision a Machine learning algorithm can predict and how much the epochs can improve our model [4].

Mehar Vijh et al works on Fake Neural Organize and Arbitrary Woodland methods have been utilized for foreseeing the following day closing cost for five companies having a place to diverse segments of operation. The money related information: Open, Tall, Moo and Near costs of stock are utilized for making unused factors which are utilized as inputs to the demonstrate. The models are assessed utilizing standard key markers: RMSE and MAPE. The moo values of these two markers appear that the models are proficient in anticipating stock closing cost [5].

III. METHODOLOGY

Existing Method

Stock showcase expectation remains a profoundly examined region in spite of its challenges due to the market's tall instability. Analysts have investigated different relapse procedures such as direct and calculated relapse, at the side Choice Trees and LSTM models, to successfully figure stock costs. This inquire about is conducted utilizing datasets from Tingo and Yahoo, centering especially on the JPX Tokyo Stock Trade Expectation, a sizable dataset. The same calculations are connected to foresee the ITC Restricted Stock Cost for comparative assessment. The closing cost is basically utilized as a key figure in preparing these models. Each strategy has appeared progressed estimate exactness, yielding positive results, highlighting the noteworthiness of exactness in stock advertise expectation.

Proposed Method

Trait such as: cost of open, tall, moo, near, volume, adj near cost taken from colossal dataset are nourished as input to the models for preparing. To pre-process the information procedures like Information cleaning, Testing information etc. is connected on the dataset. After this information is separated into two sets specifically preparing and testing which are proportion of 80:

20 separately. At that point, this set are utilized to prepare a demonstrate utilizing three distinctive approaches:

Arbitrary Woodland, LSTM and Choice Tree. At long last, all these models are assessed utilizing different assessment measurements like R Square Mistake, Root Cruel Square Blunder (RMSE), Cruel Outright Blunder (MAE), Cruel Squared Mistake (MSE).

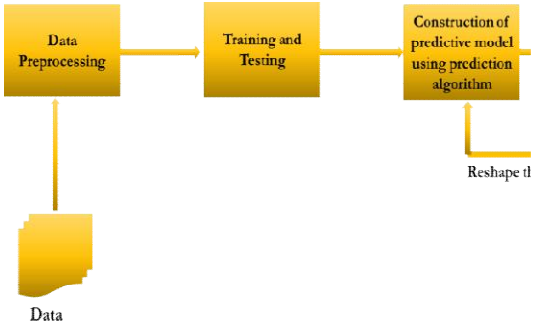

Figure 1: Block Diagram for process of StockSight Prediction

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

Figure 1 represents a distinct step or function in the stocksight prediction process. The arrows between blocks indicate the flow of data or results from one step to the next. This diagram helps visualize how data flows through the system and how different components interact to achieve the goal of predicting stock market trends.

IV. RESULTS AND DISCUSSIONS

Arbitrary Timberland, LSTM and Choice Tree calculations were prepared and tried with JPX-Tokyo- Stock-Exchange-Prediction and ITC Restricted Stock datasets. The dataset is part into preparing and testing with the proportion 80% and 20% separately. The gotten comes about are appeared within the taking after figures and tables.

4.1 EXPERIMENTAL RESULTS OF THE PROPOSED LEARNING ARCHITECTURE

The Stock Showcase Forecast examination compares two dataset Dataset 1 and Dataset2, to compare the Quality of the dataset. The dataset 1 comprises of chronicled stock information of JPX-Tokyo- stock-exchange-prediction. The dataset incorporates 1048576 lines and 6 columns. The data is assembled between January 2017 to April 2019. The properties are Date, Open, Moo, Tall, Near, Volume. The dataset 2 comprises of verifiable stock information of ITC Constrained stock cost. The dataset incorporates 6684 lines and 7 columns. The data is assembled between January 1996 to July 2022. The properties are Date, Open, Moo, Tall, Near, Adj Near, Volume.

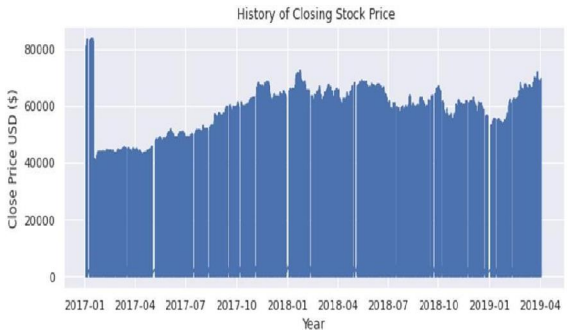

Figure 2. Tokyo Stock Dataset

Figure 3. ITC Limited Stock Dataset

Figure 2 outlines the Closing cost of the JPX-Tokyo-Stock-Exchange Expectation dataset. It appears the Closing cost of January 2017 to April 2019. This figure demonstrates the Stock's Closing cost (final exchanged cost) on that specific day of stock advertise exchanging. We are able see that Stock costs are fluctuating each day.

Figure 3 outlines Closing cost of the ITC Restricted Stock Cost dataset. It appears the Closing cost of January 1996 to July 2022. This figure shows the Stock's Closing cost (final exchanged cost) on that specific day of stock showcase exchanging.

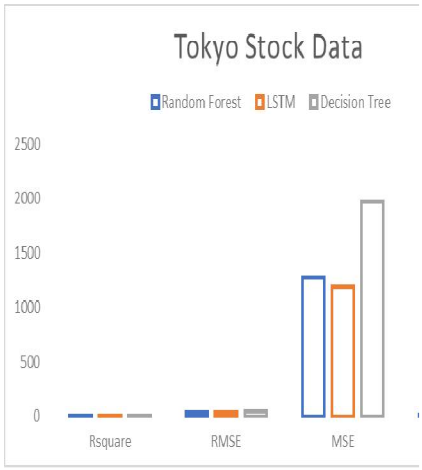

Figure 4: Tokyo stock data

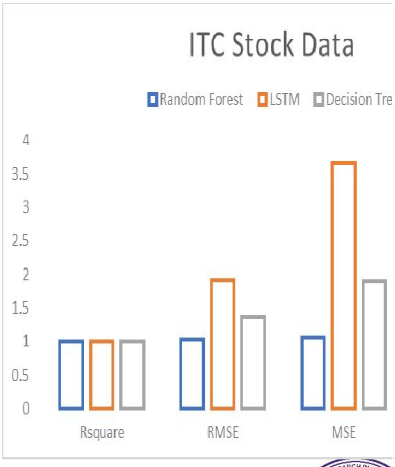

Figure 5: ITC stock data

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

Figure 4 compared three algorithms like Random Forest, LSTM and Decision Tree. LSTM gives good result than the other model for the Tokyo stock dataset.

Figure 5 compared three algorithms like Random Forest, LSTM and Decision Tree. Random Forest gives good result than the other models for the ITC stock dataset.

Comparison between Tokyo and ITC Dataset

Models	R square	RMSE	MSE	MAE
Random Forest	0.9998	35.6801	1273.0703	14.5896
LSTM	0.9998	34.4055	1183.7418	14.6485
Decision Tree	0.9997	44.3796	1969.5504	18.7596

Table 1: Accuracy for Tokyo stock dataset

Table 1 appears that the exactness of Tokyo dataset that LSTM gives great result than the other demonstrate for the Tokyo stock dataset

Models	R square	RMSE	MSE	MAE
RandomForest	0.9998	1.0287	1.0583	0.5560
LSTM	0.9937	1.9132	3.6606	1.5228
Decision Tree	0.9998	1.3786	1.9006	0.6821

Table 2: Accuracy for ITC stock dataset

Table 2 appears that the exactness of ITC dataset that Irregular Woodland gives great result than the other demonstrate for the ITC dataset.

V. CONCLUSION

In our research, we examined how different machine learning models—Random Forest, LSTM, and Decision Tree—performed using two distinct datasets: JPX-Tokyo Stock Exchange Prediction and ITC Limited Company Stocks. We observed that LSTM outperformed Random Forest and Decision Tree models in predicting future values for the JPX-Tokyo Stock Exchange dataset. However, when we analyzed ITC Limited stocks, Random Forest produced better results compared to LSTM and Decision Tree models. It's essential to understand that stock market movements aren't always predictable or uniform in their patterns. These fluctuations vary depending on the specific companies and sectors involved, influencing how long trends persist and their impact. By comprehending and assessing these cycles and trends, investors can identify potential opportunities for increased profitability

REFERENCES

[1] Davane, Abhinit, et al. “stock market prediction using machine learning”, International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 p-ISSN: 2395-0072 Volume: 08 Issue: 05 | May 2021 www.irjet.net.

[2] Vignesh, C. K, "Applying machine learning models in stock market prediction”, EPRA International Journal of Research & Development (IJRD) (2020): 395-398.

[3] Pawaskar, Shreya, “Stock Price Prediction using Machine Learning Algorithms”, International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538 Volume 10 Issue I Jan 2022- www.ijraset.com

[4] Moghar, Adil, and Mhamed Hamiche, " Stock market prediction using LSTM recurrent neural network", Procedia Computer Science 170 (2020): 1168-1173.

[5] Vijh, Mehar, et al. “Stock closing price prediction using machine learning techniques”, Procedia computer science 167 (2020): 599-606.

[6] Bhardwaj, Pragya, and Jayant Kwatra, “Stock Market Price Forecasting Using Recurrent Neural Network”, Indonesia Journal on Computing (Indo-JC) 7.1 (2022): 51-60.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, November 2024

[7] Umer, Muhammad, Muhammad Awais, and Muhammad Muzammul, " Stock market prediction using machine learning (ML) algorithms", ADCAIJ: Advances in Distributed Computing and Artificial Intelligence Journal 8.4 (2019): 97-116.
[8] Ghani, M. Umer, M. Awais, and Muhammad Muzammul, "Stock Market Prediction Using Machine Learning (ML) Algorithms", Advances in Distributed Computing and Artificial Intelligence Journal, eISSN (2019): 2255-2863.
[9] Reddy, V. Kranthi Sai, "Stock market prediction using machine learning", International Research Journal of Engineering and Technology (IRJET) 5.10 (2018): 1033-1035.