BUY TODAY SELL TOMORROW [BTST] A SHORT SELLING TECHNIQUE USING PREDICTION ALGORITHM

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ABSTRACT
 In the past few years even after volatility, stock market trading has become exceptionally preferred as a reliable source of Income. Buy Today Sell Tomorrow [BTST] is a technique of trading where traders leverage short term volatility by purchasing shares today and sell them the next day. Artificial Intelligence [AI] based applications on the stock market can be seen at its peak today, where the investors use machine learning techniques like LSTM, RNN, Deep learning to predict the price of the stock in future. Based on past data these techniques help in prediction of the movement of the stock. The larger the data given to the system the accuracy gets stronger. Based on the various technical indicators like MACD, RSI, Bollinger Band, Super Trends etc. and by providing longer past data to the system helps in predicting the movement of the stock. This paper is based on MACD and RSI with LSTM techniques on selected stocks to identify the optimum BTST stock for short term trading. The researchers in this paper have tried to forecast the price movements based on the machine learning technique. For the same five stocks, were identified from NSE portal and past four years' data were extracted and fed to the LSTM program to track the trend prevailing for that stock and machine level forecasting of data to the next day was performed. The output obtained through real-time stock price clearly shows a positive sign of movement as predicted the day before. Thus, this technique helps in avoiding long term market volatility and short-term profits.
Keywords Stock market, BTST, LSTM, Machine Learning, Prediction, trading

Introduction

Modern economies are greatly impacted by finance. Because of the state of the securities industry, money invested has turned into both art and science. Investors are always looking for the best return with the least amount of risk. To profit from stock market shares, investors use technical and/or investigative methods to determine their likely future worth. The returns on securities can alter depending on a variety of technical indicators both inside and outside of the business units. Therefore, all parties participating in the capital market were interested in comprehending these technical signs and how they affected security returns. Time should be considered while picking an investment. Spending time in the market is more important than timing it. Prices of shares fluctuate over time. A profitable activity requires investors to have knowledge of the appropriate investment type, size, and timing. People are generally drawn to seductive technical appeals by the attraction of extraordinary benefits.

Buy Today and Sell Tomorrow [BTST] is a supreme trading strategy wherein substantial profit can be obtained. It is a process where shares are sold before they are credited in the respective demat account. The strategy of buy today and sell tomorrow has its own risks and rewards. If things are planned better, it can minimize the risks to a great extent as it becomes difficult to pin-point strategies exclusively for short term trading. After the removal of regulation regarding clients being connected to computers for automation and prediction. It is difficult to strategies for these short-term trading in stocks. The intervention of computers in the stock exchange has enabled automatic entry and exit from a stock. The algorithms advise the users with the exact time to enter and exit the market based on preset criteria. All the aspects like timings, price, quantity of order is done through this automated system for better outputs.

Algorithmic trading, sometimes known as "AT," is the automation of trading methods and contributes to the improvement of many repetitive procedures in the financial markets. There must naturally be a very close correlation between prices when a securities trades on several exchanges, such as NSE and BSE or spot and futures. Computers are excellent at carefully looking out for these, placing orders without error. Citadel Investment Group, Morgan Stanley, Credit Suisse, First Boston, Deutsche Bank, Goldman Sachs, Lehman

Brothers & Citigroup are a few of the world's top algorithmic trading firms. India has already developed a stock market that uses a lot of computers. The entire ordering process is now computerized, including matching orders, risk management, payment, and settlement.

Overview of Stock Market & Lstm Techniques

Investment in the stock market has become one of the most preferred investment avenues in today's era. The most attractive aspect of investing is growing with the invested company, enjoying dividends and whenever needed buy and sell to earn more profits. The three major categories in which stocks are divided are income, value and growth-based stock. These stocks not only thrive to perform well in their category but generate regular income for the investors too provided investors should understand the kind of stock and its fundamental strength of the business.

Programmers have been captivated by the development of computer algorithms like ML and AI for stock price prediction. Since stocks are dynamic and market attitudes change frequently, linear models do not provide the most reliable means of predicting stock prices. The prices can be predicted by humans with the right in-depth research. But not everyone enjoys investing such a great deal of time and effort. Can we create something that can think similarly to humans? Thus, neural networks enter the picture. Traditional NNs are unable to hold the memory needed for better stock price prediction. The use of RNN is then possible, although RNN also exhibits Vanishing Gradient and is unable to store long-term dependencies. The length of time that recurrent networks can recall this information is not defined, but they do have a memory state that can hold background information and details about previous inputs. This duration is dependent on the input data that was given, the context, and the weights.

LSTM can by default store data for a very long time, which helps to build a better network. By removing unnecessary data, LSTM enables the long-term preservation of context-relevant and significant information. The prediction of stock prices is a time series problem, and the data originate from several domains, including irregular fields like social science, finance, engineering, physics, and economics. These include finance, physics, engineering, and economics. Price trends are exceedingly difficult to forecast when they are this complex. The four basic price components of a general stock are the Open Price, High Price, Low Price, and Close Price. These four price components are the focus of practically all study (OHLC). With the study of these elements, numerous algorithms have been created to forecast the next day's price of a stock.

Literature Review

Sudheer (2021) in his work has performed technical analysis on stocks of selected companies. The technical analysis helps in assisting the investment decisions in the Indian stock market. The author has stated that technical analysis provides impartial solutions in a partial world.

Vinutha (2018) compares the chosen technical apparatus accessible for forecasting. The revision tries to confine the opposing views of different tools used in technical analysis. The study aims to investigate the matter through technical analysis.

Valarmathi & Kowsalya (2016) has stated the importance of technical analysis in the secondary market. These analyses provide better analysis of stocks as well as provide better insights to the trading charts. The researcher in this study has applied various technical analysis tools like EMA and RSI for extracting useful outcomes from the past data.

Vaiz & Ramaswami (2016) in this research the researcher has studied with the help of investors to obtain useful information about the technical indicators. This increases the proportion of profitable trading and improves investment returns.

Ayre (2018), a researcher has performed an investment decision study where he has revealed that investors prefer buying and selling by applying both fundamental and technical analysis. The researcher has stated the usefulness of both fundamental and technical analysis together and how it helps in better decision making. According to the author, trend reversals, timings from technical analysis and financial strength from fundamental analysis when used simultaneously provides the investors with ample amounts of useful information.

Vijhaet al., (2020) studied the historical data set of data available on respective company's websites. Accuracy in price forecasted can be obtained through financial data.

Moghar & Hamiche (2020) in their research work has studied two stocks from Network Stock exchange of GOOGLE and NKE. Through the application of LSTM RNN, a model has been developed where 80 percent of the data is used for training and rest of the data is used for testing. The researchers through this study have improved the prediction of the stock to a great extent through the application of various epochs.

Shen & Shafiq (2020) in their research article to analyze the short-term stock prediction using deep learning. The author has studied the data sets consisting of 3558 stocks from the Chinese stock market. Detailed algorithm is prepared for getting the best combination of features which expand the data set for Principal Component Analysis algorithm and to reduce the dimension of j features data sets.

Talwar (2019), has analyzed technical analysis tools to get the best blend of stocks. The author has taken half yearly patterns of data from Bloomberg for secondary reference of various sectors. He has mainly analyzed the data for understanding the trend reversals exact time frame and accordingly work on the same.

Pushpa (2017) is a study that focuses on predicting the movements of stocks and helps investors with appropriate decision making. This study has concentrated on six major pharmaceutical companies for research. Various tools like RSI, MACD and ROC are applied to identify a pattern for efficient decision making.

Joghee (2021), the researcher in this research paper has studied the EMA Crossover on Nifty Index to design system trading and develop strategies for helping the investors for trading and investment done accordingly.

Research Gap

Overall, from the above review of research work done, it can be understood that lots of work has been done using technical indicators to understand the movement of charts and decision making accordingly. It can also be understood from the above research that lots of work has been done to predict the stock movement using machine learning techniques. One more aspect that can be understood is that we do not have an effective system to predict the exact movement due to the interference of various sentimental traumas. So, the researcher in this study has come up with an alternative to buy today and sell the next day to avoid any big trend change happening due to external factors. The algorithm formulated will help in speculating the future trend and immediately the short-term traders can capitalize on the same.

Research Methodology

Current research aims for studying time series forecasting – multivariate time series models for stock market prediction for next day market value.

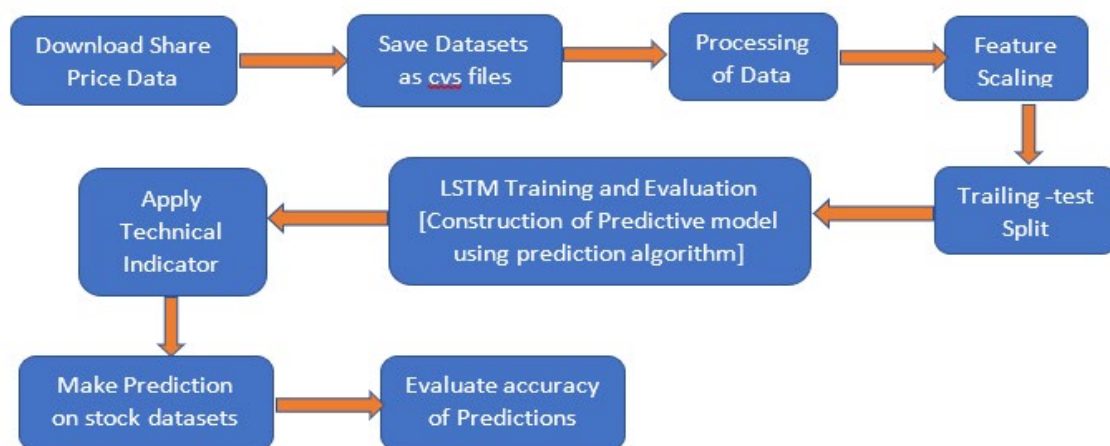General Framework of Stock Price Prediction Implementation using Machine Learning is as follows:

Figure 1: Framework for Stock Price Prediction

The Researcher has proposed designing and implementing a strategy engine for LSTM using genetic and machine learning algorithms where stock/equity prices data will be extracted from yahoo finance. For study purposes five stocks of different categories are identified for which past four years' data has been fed into the algorithm for next day's prediction.

Implementation - Secondary sources were used in the research design to accomplish the research's goal. For which technical analysis tools were used for better understanding. Out of various technical tools MACD and RSI, the most widely used techniques were used in this research to get efficient prediction of data. The goal of this research is to make use of friendly applications to help the investor and traders to have better and easier forecasting.

Time period of the study: Data related to five different companies were chosen whose 4 years past data i.e., from 1st January 2019 to 13th February 2023 has been used for analysis.

Selection of the sample: The data used in this research paper is of the Page Industries Limited [PAGEIND] from the given time of the study. The researcher attempted to predict the closing price for any given date after trailing the past data. The prediction must be made for the Closing (Adjusted closing) price of the data. Since money control already adjusts the closing prices for us, we just need to make a prediction for the "CLOSE" price. The dataset is of following form:

```
Tensorflow Version: 2.10.0
Num GPUs: 0
[*********************100%***********************]  1 of 1 completed

                    Open          High          Low           Close         Adj Close     Volume
        Date
2019-01-01    25200.000000  25200.000000  24602.550781  24847.199219  23998.572266   33677
2019-01-02    24790.000000  25111.000000  24330.000000  24591.150391  23751.269531   29590
2019-01-03    24500.000000  24700.000000  23529.449219  23614.099609  22807.587891   41968
2019-01-04    23800.000000  24000.000000  22532.599609  22663.000000  21888.972656   72358
2019-01-07    22977.650391  23498.800781  21825.000000  21907.550781  21159.324219  169813
```

Table No 1 Previous Years Data OF Page Industries LTD

To visualize the data in the graphical form, the researcher used the matplotlib library for easy understanding. The researcher has plotted all data-based parameters with the no of items (no of days) available. Following is the snapshot of the plotted data will help in understanding the open price for the day, likewise close price for the day and days low and day high, adjusted close and volume is shown in the chart below.
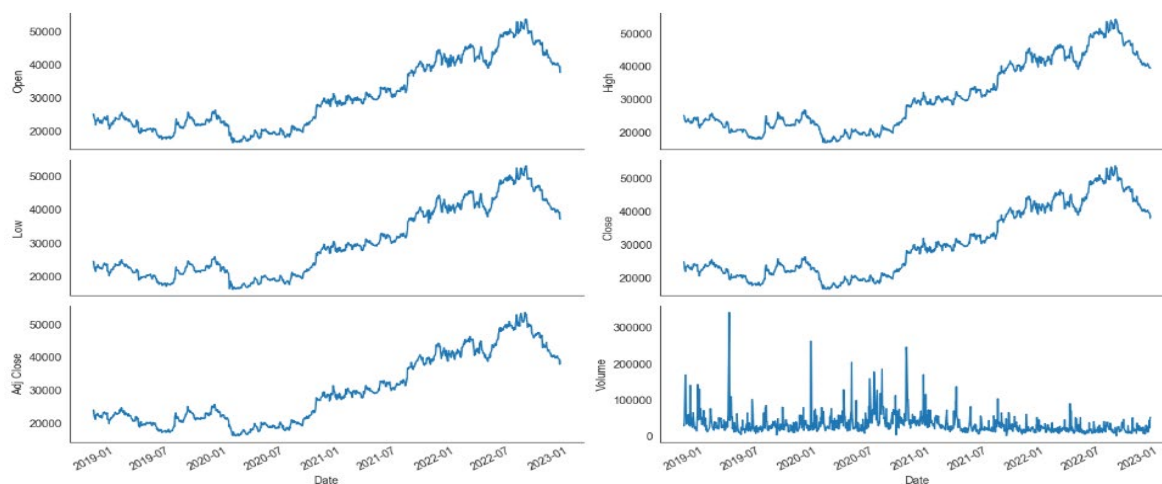

Figure 2 Close Price for Last 5 Year Data

Researchers have tried to predict the next day's price movement by generating trailing data and test data for the given stock.

```
(766, 50, 5) (766,)
(203, 50, 5) (203,)
0.1930425119141777
0.1930425119141777
```

Figure 3 Generating trailing data.

Algorithms and Techniques - To successfully anticipate the Stock Price, the researcher had to analyze time-series data and consider as many possibilities as possible. The researcher has calculated Median Absolute Error, Mean Absolute Percentage Error, Median Absolute Percentage Error (MDAPE) for preparing a prediction model. The below displayed output is applied for one particular stock like Page Industry which are given below.

Figure 4 Trailing Data on Last 5 Years Data

Results – The result obtained through a prediction algorithm provides us with a valid price and predicted Price which at every step compares the actual and predicted to provide more accuracy in the results. Blue colored graphical lines tell us the actual price variations. Whereas the purple-colored graphical lines show the predicted values. Orange colored lines give us confirmation that the previous price prediction and the actual market movement is near to the same. Following are the predicted results from the benchmark model which is shown below.
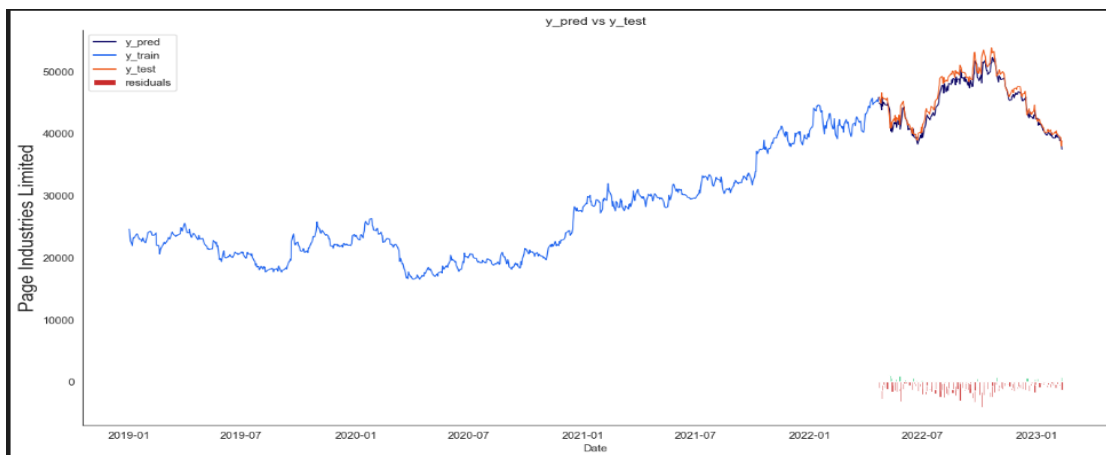

Figure 5 Prediction Benchmark Model

Figure 6 Next day prediction of Page Industries Stock

Based on the above three predictions we got to understand the actual price movement, predicted price range and third which compares the deviation between the actual and the predicted and calculates the next day's value. From the above example of Page Industries, it can be observed that the close price was 38786.2 and the next day's prediction obtained through the algorithm is 38443.48. Thus, it clearly indicates the investor to sell the stock and buy the next day. Likewise, for the five different companies the data is predicted whose values can be seen in table no 2

Sr. No.	Name of Stock	Current Closing Date	Current Closing Price	Next Opening Date	Next Day Market Price	Percent to Change
1	Atul Auto	13-02-2023	366.7	14-02-2023	360.4	-1.74%
2	Ambuja Cements Ltd	13-02-2023	360.8	14-02-2023	382.1	5.58%
3	Sun Pharmaceutical Industries Limited	13-02-2023	1006.6	14-02-2023	998.4	-0.82%
4	Page Industries Ltd	13-02-2023	38786.2	14-02-2023	39723.87	2.36%
5	Tata Consultancy Services Ltd	13-02-2023	3537.55	14-02-2023	3549.48	0.34%

Table No. 2 Next date prediction of Stock

Conclusion

The Researcher forecasts closing prices with a relatively low Mean Squared Error, there are still a lot of issues with it. The designed evolutionary prototype for proposed machine-based strategy engine for neural networks gives simplification and improvement in processing logic and speed applied may be helpful for future research domains. The value for an upcoming date can be checked by the user through a user interface (UI). And only selected stock was utilized for this study; however, we might add more stocks firms to the list to make it more complete.

Thus, these LSTM models, when efficiently used, help in making exact technical analysis which in turn helps in identifying for the right time to enter and get exited from the market. Since these models use their own past performance to predict the next day's market value movement, they become more reliable and effective in decision making and put options related to buying Indian stocks. The entire procedure predicts the outcome of average Equity Price prediction results for certain sets of constraint values observed in data. The Obtained result shows close actual and predicts lines of average stock price with influential data change. In future research, the researcher has planned to use different strategies values as parameters to train models for equity price prediction to add value to novel strategies.

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