

Predicting Stock Market Trends Using Machine Learning

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Abstract -The aim is to predict the Stock Market the longer-term value of the financial stocks of a concern. The current trend in available marketplace prediction technologies are the use of machine learning which makes predictions supported the values of current stock exchange catalogues by training on their previous values. Machine learning itself engagements different models to form prediction easier and reliable. The paper motivations on the utilization of LSTM and Monte Carlo based Machine learning to predict stock values. Features considered are open, close, low, high, Quantity and Turn over.

Key Words: Close, high, low, LSTM model, open, regression, and volume.

1. INTRODUCTION

An accurate prediction of stocks can prime to huge earnings for the vender and the agent. Regularly, it is carried out that prediction is confused rather than random, which means it can be projected by carefully analyzing the past of respective stock marketplace. Machine learning is a regimented way to represent such procedures. It predicts a market price close to the perceptible value, thereby growing the accuracy. Overview of machine learning to the area of stock prediction has charmed to many researches because of its competent and precise measurements. The main part of machine learning is the dataset used for prediction. The dataset should be as existing as possible because a little modification in the data can continue massive deviations in the outcome [2]. In this project proposed, supervised machine learning is active on a dataset found from Yahoo Finance. This dataset comprises of following five variables: open, close, low, high, Quantity and Turn over. Open, close, low and high are different bid values for the stock at detached times with closely straight names. The Quantity is the number of stocks that agreed from one owner to additional during the time period. The model is then trained and tested on the dataset. LSTM and Monte Carlo models are involved for this estimation separately. Monte Carlo involves minimizing error and predicting closing price in online using web data reader and LSTM [3][4] donates to recalling the data and outcomes for the wide-ranging run. Finally, the graphs for the oscillation of prices with the dates (in case of Monte Carlo based model) and between actual and predicted value (LSTM based model) are plotted. The paper involves of following: Part 9 parts frontward the two models implemented and the methods used in them in detail. Part 7 discusses the results produced with altered plots for both the models in detail. Part 8 consists of conclusion and the last section contains the references.

2. Literature review

[1] Survey on stock market prediction using machine learning techniques this paper aim is to predict the share or stock market presentation with the support of an artificial neural network. The techniques of artificial neural networks classify the stock in mostly three categories that is purchase, grasp and trade, maintained previous data. It's experimental that the logistic regression model is working by every separate to predict a stock in a very better way.

[2] Survey on stock market estimate using machine learning algorithms. The paper proposed to predict the stock program with good accurateness. The dominion of notice is that the dataset of the stock values from past years. The raw dataset must be pre-processed for data study. After pre-processing the data, we are going to implement machine learning techniques like random forest and support vector machines on the dataset to come up with the results.

[3] Survey on predicting stock prices using LSTM Prediction the stock prices have always been a difficult task for the analysts. The investors are highly curious about the stock prediction. For a successful investment, many investors have a motivating knowing the long-run condition of the stock market. The prediction models for the stock market helps the depositors and also the analysts by providing the long run information of the stock market. Recurrent neural networks (RNN) and Long Short-Term Memory (LSTM) is the machine learning approaches used for stock price prediction.

[4] Survey on stock trend prediction using regression Analysis A data mining approach various organizations is collecting data, building large data warehouses to store the collected data. Determining the knowledge out of the composed data is done by paying a technique called data mining. Data mining software tool is active to extract values of the variables from the dataset to predict the long-run values of other variables with the application of time series data.

[5] Survey on stock market prediction using machine learning Emerging an application for studying and predicting stock market prices rises the investor's curiosity in stock markets. First, we have to analyses the current and developing methods of stock price estimate. The different methods are fundamental analysis, technical analysis, and also the application of machine learning. Essential analysis and machine learning are familiarized to guide an investor's decisions. Whereas the practical analysis methodology provides restricted useful information.

3. Proposed system

We will develop a financial data predictor program in which there will be a dataset storing all historical stock prices and

data will be treated as training sets for the program. The main purpose of the prediction is to decrease indecision associated to asset decision making. We suggest a Deep Learning (DL) method that will be trained from the accessible stocks data and gain intelligence and then practices the learned knowledge for an accurate prediction. Our proposed system uses a LSTM and Monte cario methods to predict stock prices for the large and small capitalizations and in the three different markets, retaining prices with both daily and up-to-the-minute occurrences.

4.Methodology

LSTM is the progressive version of Recurrent-Neural Networks (RNN) where the data belonging to previous state perseveres. These are dissimilar from RNNs as they involve long term dependances and RNNs works on finding the connection between the recent and the present information. This shows that the intermission of data is relatively smaller than that to LSTM. The main resolution behind using this model in stock market prediction is that the predictions depend on large amounts of past data and are generally reliant on on the long-term history of the market[6]. So, LSTM controls error by giving an aid to the RNNs through absorbent data for older stages making the prediction more correct [7]. Since stock market contains processing of large data, the inclines with respect to the bulk matrix may become very small and may destroy the learning amount of the system. This resembles to the unruly of Vanishing Gradient. LSTM prevents this from happening. The LSTM contains of a retention cell, input gate, yield gate and a forget gate. The cell remembers the value for long term spread and the gates regulate them [8]. In this paper, a sequential model has been completed which involves loading two LSTM layers on top of each other with the output value of 256. The input to the layer is in the method of two layer [0] and layer [1].

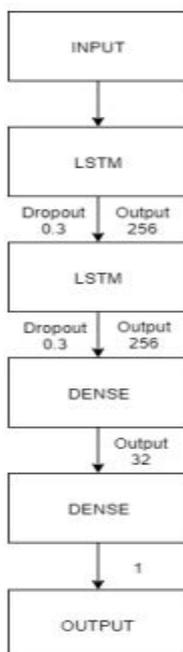
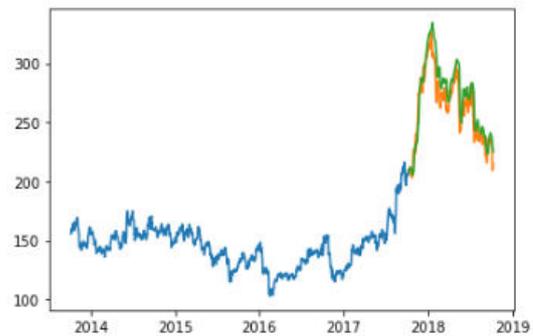


Figure.1 LSTM Layers

A dropout value of 0.5 has been fixed which means that 0.5 out of total nodes will be solid during the training process to evade over-fitting of data and upsurge the speed of the training process. At last, the core dense layer where each neuron is linked to every other in the next layer is added providing input of 35 parameters to the next core layer which gives output as 1. The model is amassed with a mean square cost function to maintain the error through the process and accuracy is select as a metric for the prediction.

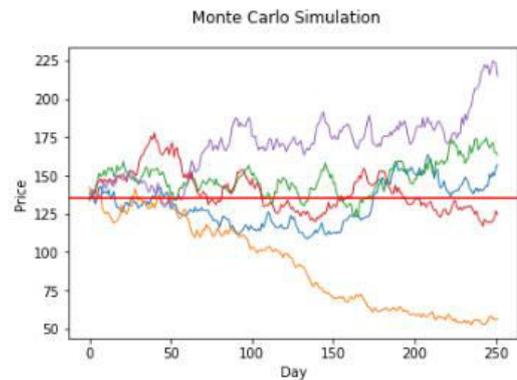
5.Experimental results

The proposed system is trained and tested finished over the collected dataset taken from Tata Global. It is split into training and testing sets individually and profits the following results upon passing through the Two models:



5.1 LSTM Based Model Results

Figure 2. Plot between Actual and Predicted Trend of LSTM



5.2. Monte Carlo Simulation

Figure 3. Plot between Actual price and Predicted Monte Carlo

The above graph figure 1 is plot over the data having batch size 250 and 50 epochs. The prediction is shown by green line and the actual trend is revealed by orange. The closeness of these two lines tells, how effectual the LSTM based model is. The prediction be similar to real trend when a

significant amount of time has passed. The more the system is trained the superior the accuracy which will be achieved.

6.CONCLUSIONS

Two techniques have been utilized in this paper: LSTM and Monte Carlo, on the Tata Global finance dataset. Both the techniques have exposed an upgrading in the accuracy of predictions, thereby given positive results. Use of recently announced Deep learning techniques in the prediction of stocks have given promising outcomes and thereby noticeable the use of them in gainful exchange arrangements. It has led to the assumption that it is possible to predict stock market with more precision and efficacy using machine learning techniques. In the future, the stock market prediction system can be further upgraded by utilizing a much large dataset than the one being utilized presently. This would help to upsurge the accuracy of our prediction models. Besides, other models of Deep Learning could also be calculated to check for the accuracy rate resulted by them.

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The heading should be treated as a 3rd level heading and should not be assigned a number.

REFERENCES

1. Rao, Polamuri Subba, K. Srinivas, and A. Krishna Mohan. "A survey on stock market prediction using machine learning techniques." In ICDSMLA 2020, pp. 923-931. Springer, Singapore, 2020.
2. Sharma, Ashish, Dinesh Bhuriya, and Upendra Singh. "Survey of stock market prediction using machine learning approach." In 2017 International conference of electronics, communication and aerospace technology (ICECA), vol. 2, pp. 506-509. IEEE, 2017.
3. Roondiwala, Murtaza, Harshal Patel, and Shraddha Varma. "Predicting stock prices using LSTM." International Journal of Science and Research (IJSR) 6, no. 4 (2017): 1754-1756.
4. Abdulsalam, S. O., Kayode S. Adewole, and R. G. Jimoh. "Stock trend prediction using regression analysis—a data mining approach." (2018).
5. Rao, Polamuri Subba, K. Srinivas, and A. Krishna Mohan. "A survey on stock market prediction using machine learning techniques." In ICDSMLA 2019, pp. 923-931. Springer, Singapore, 2020.
6. Mohan, S., Mullapudi, S., Sammeta, S., Vijayvergia, P. and Anastasiu, D.C., 2019, April. Stock price prediction using news sentiment analysis. In 2019 IEEE Fifth International Conference on Big Data Computing Service and Applications (BigDataService) (pp. 205-208). IEEE.
7. Kim, Taewook, and Ha Young Kim. "Forecasting stock prices with a feature fusion LSTM-CNN model using different representations of the same data." PloS one 14, no. 2 (2019)
8. Ghosh, Achyut, Soumik Bose, Giridhar Maji, Narayan Debnath, and Soumya Sen. "Stock price prediction using LSTM on Indian share market." In Proceedings of 32nd international conference on, vol. 63, pp. 101-110. 2019.
9. Bakir, Houda, Ghassen Chniti, and Hédi Zaher. "E-Commerce price forecasting using LSTM neural networks." International Journal of Machine Learning and Computing 8, no. 2 (2018): 169-174.
10. Nelson, Adriano CM Pereira, and Renato A. de Oliveira. "Stock market's price movement prediction with LSTM neural networks." In 2017 International joint conference on neural networks (IJCNN), pp. 1419-1426. IEEE, 2017.