



Stock Market Prediction Using Machine Learning

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ABSTRACT

In this study, we focus on predicting the stock market using a few machine learning techniques. Nowadays, machine learning is pervasive, and the stock market is a very popular topic. After a lockdown, many people were interested in the stock market. However, the majority of them are losing money because they lack sufficient stock market understanding and are unable to foresee or capitalise on stock movement. In this work, we thus attempt to forecast the stock market using a machine learning system in order to forecast market direction. In this project, we choose the Reliance stock from the National Stock Exchange, gather daily data on it, and build a predictive model to forecast Reliance's closing price. To forecast stock closing prices, we employ a machine learning technique known as Long-Short Term Memory (LSTM).

Keywords:- Stock prediction , Machine Learning, LSTM.

1. INTRODUCTION

Since the stock market has received so much attention in recent years, a lot of individuals are drawn to it. Trading and investing may benefit greatly from an accurate stock prediction[1], but doing so is currently quite tough. Since the Covid era, market volatility has been quite high, and market fluctuations are also very high. and too many folks are suffering losses. Changes in the stock market may affect a person's investment's attitude[2]. There are basically two different forms of analysis: fundamental analysis and technical analysis. In fundamental analysis, investors look at a company's business plan, returns on equity, and performance[3]. In technical analysis, traders are focused on price movement using various tactics, volumes of data, indicators, etc. Recently, machine learning has gained more attention, which is why more people are applying it in this area. It is relatively simple to anticipate stock prices and market trends with the aid of machine learning algorithms. In addition, individuals may make far better predictions with more accuracy and while keeping in mind all possible variables with the use of machine learning. The stock market prediction has been a prominent study area since traders and investors strive to anticipate the stock market in order to minimise losses. Since it efficiently addresses the redundancy of pertinent information in historical data, the LSTM, or long-sort term memory model, is used in this study. It is particularly well-liked in the field of financial forecasting.

One of the most important aspects of machine learning is the dataset used. Because even little modifications to the data might result in significant changes in the final product, the dataset should be as precise as possible[4]. We gather the data for this project from Yahoo Finance. The data is broken down into five categories: open, high, low, close, volume, and adj volume. The volume is the total number of shares that are traded between buyers and sellers. Since forecasting market trends is a major concern, several experts and organizations have studied it[5].

2. METHODOLOGY

Stock market forecasting is a challenging task. However, if we employ the right machine learning methods, we can forecast the market. Although there are various models for machine learning, in this study we focus on the Long-sort term memory (LSTM) model to forecast the industry[6], [7].

2.1. Long-sort term memory (LSTM):-

Long sort term memory (LSTM) is the special Recurrent-Neural Network (RNN) in which information from prior states is retained. The main reason for using this model in stock market prediction is that the predictions depend on large amounts of data and are typically dependent on the long term history of the market. LSTM could also be a specific kind of RNN with a wide range of applications, including time series analysis, document classification, speech, and voice recognition. As a result, LSTM controls error by assisting RNNs in forming predictions that are more accurate by holding onto information for earlier stages.

The stock market processes enormous amounts of data, therefore the gradients in the weight matrix may become extremely minor and may even disappear.

Due to the massive amount of data that must be processed on the stock market, the gradients with respect to the weight matrix may become quite tiny, which might slow the system's pace of learning. This relates to the Vanishing Gradient issue. This is prevented by the LSTM. An input gate, an output gate, a forget gate, and a cell state gate make up the LSTM[8]. For long-term propagation, the cell retains the value, and the gates control them.

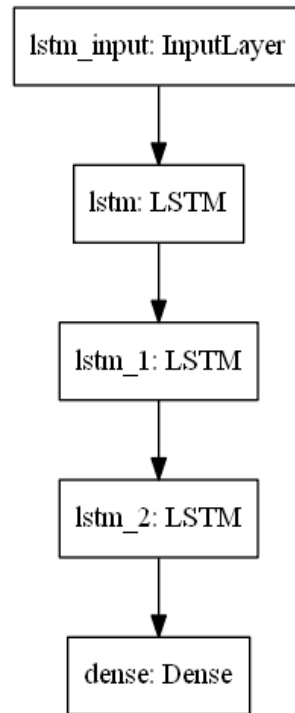


Fig1.LSTM Layer model

3.DATASET COLLECTION AND PROCESSING

In this paper we have used reliance dataset taken from Yahoofinance. We collect the daily data from the period December 2010, till September 2022. The data set consists of six attributes such as:- (1)open (2)High (3)Low (4)Close (5)Volume (6)AdjClose. We divide the data in training set and testing set of which 80 % of data are training set to train the stock prediction and remaining 20 % of data is testing set used to verify the prediction effect of the model. We use the intel i3 processor with 8 GB RAM to finish this experiment. The programming language is used to predict the stock market using machine learning is Python.

Date	High	Low	Open	Close	Volume	Adj Close
2012-01-02	351.542725	340.348846	345.128540	349.957764	8679938.0	322.067139
2012-01-03	360.037201	351.839905	352.780975	358.922760	9455771.0	330.317627
2012-01-04	362.043182	353.325836	360.284851	354.712677	8557084.0	326.443085
2012-01-05	359.071350	343.791199	354.143066	346.465851	13364666.0	318.853516
2012-01-06	358.600830	345.054230	345.252350	355.406097	9495456.0	327.081207
...
2022-09-23	2495.949951	2436.100098	2485.000000	2439.500000	4397194.0	2439.500000
2022-09-26	2417.800049	2375.149902	2394.050049	2377.350098	5759298.0	2377.350098
2022-09-27	2426.000000	2360.100098	2394.000000	2396.250000	7455448.0	2396.250000
2022-09-28	2378.000000	2327.100098	2360.350098	2332.449951	7844140.0	2332.449951
2022-09-29	2367.500000	2313.000000	2360.000000	2325.300049	6765723.0	2325.300049

Fig 2. Dataset of Reliance taken from Yahoo finance



Fig 3.Closing price of Reliance

4.RESULT

In this Section, we provide a detailed the results obtained using forecasting technique.

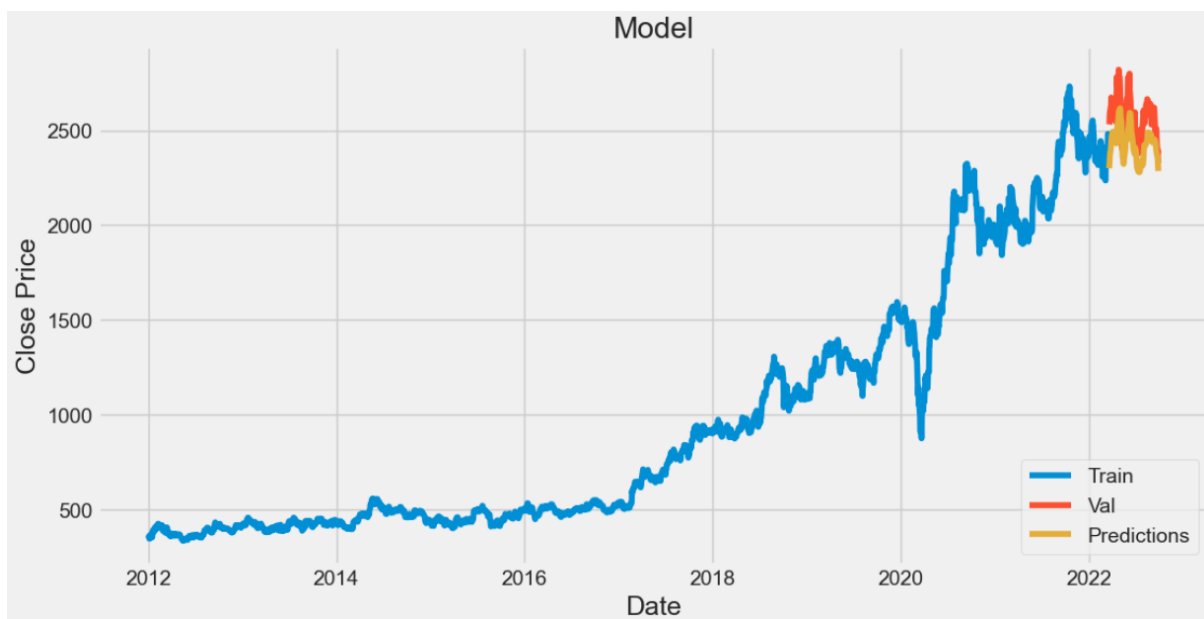


Fig 5. Predicted Closing Price of reliance

This is the Reliance Industry's closing price forecast graph. This method has a root mean square error of 156.03 since the forecast is displayed here as a red line and the actual train price as a blue hue. The forecast is quite accurate once a large amount of time has passed.

5.CONCLUSION

In this paper we have presented LSTM approach of stock prediction on the yahoo finance database .these model is based on machine learning . Algorithm shows an good accuracy of prediction it has to led the conclusion that it is possible to predict stock market with more accuracy using this

techniques.

In the future, In the future, the stock market prediction can be further improved by a much bigger dataset to predict accurate price .and some more machine learning algorithm could also studied to check the accuracy.

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