ESTIMATING PREDICTION ACCURACY OF STOCK PRICE USING ARTIFICIAL NEURAL NETWORK

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Abstract

Presently, all over the world,anenormous amount of investmentis being madeto the Stock Markets. Nationwide economic systems are sturdily associated and closely inclined to the achievement of their Stock Markets. Additionally, nowadays,trading has become too reachable capital expenditure medium, for both plannedinvestors as well as common man also.Artificial neural networks (ANN), which is a subset ofArtificial Intelligence (AI), is a way that is anticipated to select out samples (styles) and gain an information model. Significant dispositions of ANN are its capability for precise troubles with step by stepanalyzing and input-output mapping. The neural network is a superior big approach to categorize anonymous, unnoticed samples in input values that is suitable to are looking for the inventory market. Feedforward neural networks with Backpropagation schooling algorithms were taken via way of the use of way humans to make predictions.

Keywords: Artificial neural networks (ANN); NSE; Stock Price Prediction; Machine Learning;

1. Introduction

A stock marketis a public market for the looking for and promoting employer industrial business organization inventory. It is a prepared unitwith a regulatory frame, and those who exchange in stocks are registered with the inventory market and regulatory frame SEBI. Since stock market facts are quite time-version and aregenerally in anunsystematic pattern, predicting the destiny rate in inventory is pretty tough. Prediction offers knowledgeable data regarding the cutting-edge-day-day popularity of the stock charge motion. Thus, this will be finished in desire making for clients in finalizing whether or not or no longer or no longer or not or not to shop for or sell the right stocks of a given stock. Many kinds of research were completed for predicting stock market charge the

usage of several data mining strategies. This paintings goals at using Artificial Neural Network techniques to anticipate the inventory charge of groups indexed under the National Stock Exchange (NSE). The beyond the information of the selected stock is probably used for building and schooling the models. The effects from the model may be used for evaluation with the real statistics to have a study the accuracy of the model.

A large portion of the exercises, for example, looking through a specific stock and purchasing and selling of similar stocks in the Indian the financial exchange happens on its stock trades like NSE and BSE.The Bombay Stock Exchange (BSE) is one of the most seasoned stock trades and set up in 1875. Then again, The National Stock Exchange (NSE) was set up in 1992 as the main dematerialized electronic trade in the country.

Trading at exchanges like NSE and BSE takes vicinity through e-ledger wherein the number of shares that are being bought is matched with the exact number of share that is being sold on either of the exchanges. Once the record matches, the transaction takes place wherein the share transfer between seller and buyer takes place. This mechanism takes place throughout the day, starting from 9:15AM to 3:30PM IST.

With the introduction of an automated trading system which is provided by the third party in alliance with SEBI and bounding specific rules and regulations, any citizen can place his foot in Stock Market. In this way, one can contribute to the economy of the nation (GDP growth) as well as for the benefit of an individual.Fig. 1 shows return gains on the amount invested on Nifty.

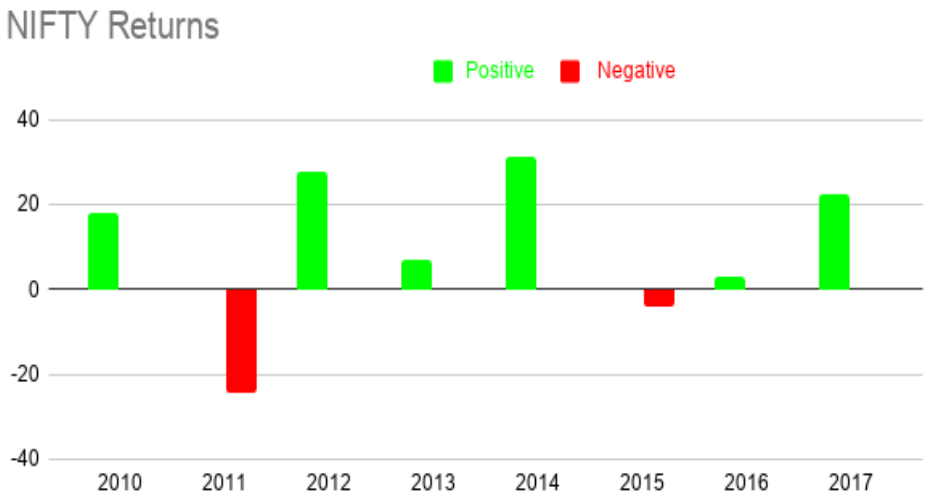

Fig. 1 Results of return gains on the amount (1Lakh rupees) invested on Nifty

The remainder of this paper is preparedas follows. Section 2 provides an analysis of the mechanism of action. Section 3 discusses the comparison between the existing system and proposed system. Section 4 provides a description of the methodology. Section 5 includes the conclusion.

2. Related Work

In this section, the related work of various authors and methodologies used in the corresponding papers are explained.The use of help vector tool (SVM) approach to enhance the general fundamental typical performance of quadratic, cubic, linear and top-notch Gaussian (SVM) for forecasting inventory price prediction became advanced on this paper. State of inventory marketplace price a hundred and seventy days modified into divided into 119 facts and 51 statistics and the number one 119 records modified into used for education and second 51 information changed into used for trying out to are looking in advance to the close to inventory rate. The four fashions prediction consequences were in comparison with the actual price of the stock market fee to assume the future inventory expenses. The tool changed into implemented using the manual vector device (SVM) and tool getting to know device bins of MATLAB 2015(a). The regularperformance of the tool modified into evaluated using Mean Absolute Percentage Error (MAPE), Root Mean Squared Error (RMSE) and Mean Squared Error (MSE) and in evaluation with the models [1].

The statistics have informed the usage of a model after which they take a look at data is administered through the professional model. We collect a confusion matrix. Confusion matrix represents the values of True compelling, fake terrible, faux remarkable, proper brilliant. True excellent in the form of accurate prediction that a price belongs to the same beauty. Proper awful is the form of correct predictions that a price does belong to the identical splendour. False positivity is the form of incorrect predictions that a charge belongs to a category even as it belongs to 3 fantasticbeauty. False lousy is the number of wrong predictions that a rate belongs to three tremendous splendour at the same time as it belongs to the identical beauty. Then we calculate great traditional regular average performance metrics represented through a way of the use of accuracy, bear in thoughts, precision and f-score [2].

Conceptual Big information investigation can be utilized in numerous areas for precise forecast and examination of the enormous measure of information. They encourage the revelation of critical data from enormous information, which is concealed something else. In this paper, we portray a methodology for the examination of the financial exchange to comprehend its unstable nature and anticipate its conduct to make benefits by putting resources into it. We initially give writing review

of past deals with this space. At that point, we give a strategy of our methodology, which contains information assortment and AI calculations. [3].

The Stock market facts are substantially time-model and are normally ina nonlinear sample, predicting the destiny charge of an inventory is pretty difficult. Prediction offers informed information concerning the present day-day popularity of the stock price motion. In the literature assessment, exceptional records mining strategies for stock marketplace prediction are reviewed. It is determined that Artificial Neural Network method can be advantageous in predicting inventory indices further to the stock price of unique corporations. Many perfect algorithms had been used with neural networks. Feedforward MLP neural network method is considered to are looking beforehand to the inventory charge of corporations listed below LIX15 index of NSE. From the save you quit end result table it is able to be concluded that the MLP neural network approach offers a remarkable output with Median Normalized Error zero.05995, Median Correct Direction % fifty-one.06, Median Standard Deviation, 6.39825 [4].

The stock marketplace is an aggregation or a cluster of patron and organization of stocks, which essentially constitute the ownership of an organization industrial enterprise agency. So, one's stocks can be furnished and supplied on stock exchanges. Since the stocks issued through a way of person groups are laid low with many various factors every outside and in the employer enterprise agency enterprise organization, the stock market may be very unpredictable. Therefore, a success prediction may also moreover need to yield massive profits. Recent research has installed that the immenseamount of on-line statistics and various social media discussions and data recollections have a propensity to have an observable effect on the financial market. So, the cause may be to investigate and determine whether or no longer or no longer or now not there can be any significant hyperlink the numerous facts articles and the facts at the internet at the stock marketplace or as an opportunity whether or not or not or not or now not or not or no longer it has any impact on the shares of stocks of an enterprise organization corporation organization. We also can because of this, decide out how every data headline should, in turn, exchange the stock marketplace [5].

Space complexity is not in any respect a hassle nowadays; however, space complexity will continuously remain as a significant element for any hybrid algorithms. These algorithms had to be adaptive in nature and get expert to the modern-day data to be had inside the marketplace. So henceforth, at the equal time as a cutting-edge fashion is placed, it has a bent to be determined in the marketplace. Then the one's adjustments need to have already been predicted through the way of the version. So the amount of training accomplished for the model want to be superior in nature. These inclinations are almost feasible because of the computational capability available nowadays. Therefore, from the literature survey, this masses quantity of data is amassed to get a profoundnotion

of the hybrid model which is wanted to be done in the near destiny. Algorithms which incorporates LSTM-GRU, LSTM-ARIMA and LSTM-GRU are very inexperienced, but the one's algorithms lagin providing correct prediction on the same time as they will be known best for as speedy as. Hence if the one's algorithms undergo non-prevent schooling, that might come to be giving very inexperienced effects [6].

Implementing CART with AVL tree the use of C language and Visual Studio for photographs. Machine getting to know is one of the maximum superior thoughts within the gift research state of affairs. Therefore, exploring device reading at the issue of statistics mining and its gaining knowledge of algorithms has hundreds of scope to an artwork. In device analyzing and facts mining, elegance is incredible for generating correct, brief and clear-cut outcomes and consequently among several techniques of device analyzing, splendour has been determined on CART (Classification and Regression Tree) is able to cope with discrete/specific competencies and offer quick, right and clean beauty consequences, and consequently, it is decided on for class of Indian inventory marketplace information [6].Firstly we are capable of describingtheCART set of guidelines then go together with the float of CART after that insertion of AVL tree set of policies, ultimately benefits of CART [7].

Implementinga device wherein the entire is uncooked statistics in terms of the inventory costs and different factors associated with the stocks. The charges than are processed with the beneficial useful resource of manner of the tool to offer a prediction about the rate and what choice to exercise,i.e. Buy Sell or Hold. Association mining tips are also finished. Association rule mining, one of the maximum crucial and nicely-researched strategies of data mining, became brought first. It dreams to extract exciting correlations, commonplace styles, institutions or simple structures amongst devices of gadgets inside the transaction databases or outstanding facts repositories. At the begin of our take, a look at we decided on nine signs and symptoms and symptoms and signs and symptoms due to their exactness in addition to they provide the same form of outputs, or their outcomes may be interpreted into standard output. Our proposed set of policies moreover gives comparable kinds of output that are Buy, Sell or Hold in which purchase way the inventory rate is going to grow and the investor is typically recommended to shop for a few shares, promote manner the stock rate will lower speedily, so the investor is usually advocated to sell his/her shares if it is in investor's portfolio and keep approach investor is suggested to keep their inventory unchanged [8].

Two techniques had been carried out on this paper: LSTM and Regression, on the Yahoo finance dataset. Both the strategies have examined a development inside the accuracy of predictions, thereby yielding top-notch consequences. Use of these days added gadget getting to know strategies within the prediction of shares have yielded promising results and thereby marked the usage of them in profitable change schemes. It has triggered the belief that its miles feasible to are expecting

inventory markets with greater accuracy and standard average overall performance using device studying strategies [9].

Data mining may be interpreted as a records discovery method. Data mining strategies are devised to deal with the issues by using the manner of offering a reliable version with information mining competencies. To gather a version that investigates the inventory patterns using the beyond inventory exchange dispositions, we use the auto-regressive covered transferring not unusual (ARIMA) model [10].

Several algorithms and techniques such as SVM, CART, Regression, Association rule mining and also historical data of stocks have been considered to predict the future price of a particular stock in order to achieve profitable trading.

Table 1 shows the comparative study that has been carried out with the proposed model and already existing model against which prediction with comparatively high accuracy is obtained. Listsreference survey papers is to demonstrate and develop our familiarity with other papers work relevant to the focus of our study.

Simplistic Model: This is a simplistic model that directly takes the trend of the last n days of historical price series as the future trend. Hence cannot be considered for short time prediction.

SVM: Support Vector Machine is a machine learning technique used in recent studies to forecast stock prices.These are used as parameters to the SVM model. The model attempts to predict whether a stock price sometime in the future will be higher or lower than it is on a given day.

ARIMA (AutoRegressive Integrated Moving Average): is a forecasting algorithm based on the idea that the information in the past values of the time series can alone be used to predict the future values.It is suitable for short term predictions only.

Table 1. Analysis of the mechanism of action

Article No.	**Findings**
[1]	In this paper, the device has ended up finished using the assist vector tool (SVM) and machine getting to know tool packing containers of MATLAB 2015(a). The average performance of the tool turns out to be evaluated using Mean Absolute Percentage Error (MAPE), Root Mean Squared Error (RMSE) and Mean Squared Error (MSE) and in evaluation with the models. The give up prevent stop result showed that the advanced Fine Gaussian version has plenty an excellent deal plenty much fewer prediction mistakes than the opportunity three models.

[2]	In this paper, they have effectively done gadget investigating calculations on the dataset for anticipating the stock commercial centre charge. They finished records pre-handling and capacity inclination at the dataset and executed four calculations: KNN, SVM, Random Forest, and Logistic Regression at the dataset. They dissected the differentiation of the calculations by figuring the generally not strange normal by and large execution measurements (exactness, Recall, accuracy, f-score). They besides situated the favourable circumstances and drawbacks of the calculations. They end that Random Forest is the phenomenal arrangement of rules out of the four with more exactness pace.
[3]	In desired, the task of financial exchange forecast is very extreme, and achieving exceptionally extreme exactness is not doable. In any case, gadget perusing systems can offer modest commercial centre movement forecasts that can be utilized by clients. The determined outcomes show that the use of help vector machines with Gaussian part and regularization has a higher familiar customary,usual presentation than the calculated relapse and SVM with perfect pieces.
[4]	In the paper, they evaluate, exceptional information mining strategies for inventory marketplace prediction are reviewed. It is located that Artificial Neural Network approach can be beneficial in predicting inventory indices in addition to the inventory rate of particular organizations. Many unique algorithms were used with neural networks.
[5]	In this project, they have got considerable evidence that there can be a correlation most of the fee of shares of stock and each day information associated with it. Through the device analyzing version, we have been capable of look at that there can be in truth an effect the one's facts articles. Though no longer masses, it is far useful for a fanatic who is deeply captivated with making an investment inside the inventory market.
[6]	This paper discusses a unique industrial business enterprise network-based indeed version that could assist are searching ahead to directional inventory fee actions the use of thinking about each influential business enterprise relationships and Twitter sentiment.
[7]	The previous research had been finished first-rate on distant places inventory marketplace facts consequently on this artwork; CART is used with Indian stock market records for type purpose due to the actual consequences acquired in the route of splendour are smooth to interpret because of its tree shape. Experimental results have confirmed that CART is better implementation the usage of AVL tree set of guidelines. It is accurate, rapid and particular.
[8]	Their work is life by means of an Internet Website. They can be right now giving the main Buy Sell Hold options for a few groups and are inside the methodology of searching for to embellish and transfer the instrument functionalities. We are performing evaluations and doing apparatus situating out and looking to improve the standard usual overall performance of the device and could profit the notable results as we rely on.

[9]	This paper modified into an attempt to determine the destiny charges of the stocks of an employer with greater accuracy and reliability using device reading techniques. The number one contribution of the researchers being the software of the novel LSTM Model as a way of figuring out the stock expenses.
[10]	This model makes a smart desire; this is using the implicit prediction, permit the factors affecting the stock fee contained in the hidden USA version, on the way to keep away from vain errors. So, the Hidden Markov Model can be used to expect the inventory price. Considering the unmarried forecast uncertainty and randomness, we make a bit alternate of the real Hidden Markov Model set of pointers.

3. Proposed work with higher prediction accuracy rate

In this project the lowest, the highest and the average value of the stock market in the last d days are used to predict the next day's and next week's market value. Recurrent Neural Network (RNN) is a popular method used to incorporate technical analysis for making predictions in financial markets. The stock market data have been extracted from NSE Stock Market dataset. Fig 2 shows the flow of work or data that has been fetched directly from the NSE and stored as a CSV file in order to carry out cleansing of data and perform predictions on the cleansed data and present the result in the graphical visualization. Fig 3 and Fig 4 indicates the flow of the proposed work.

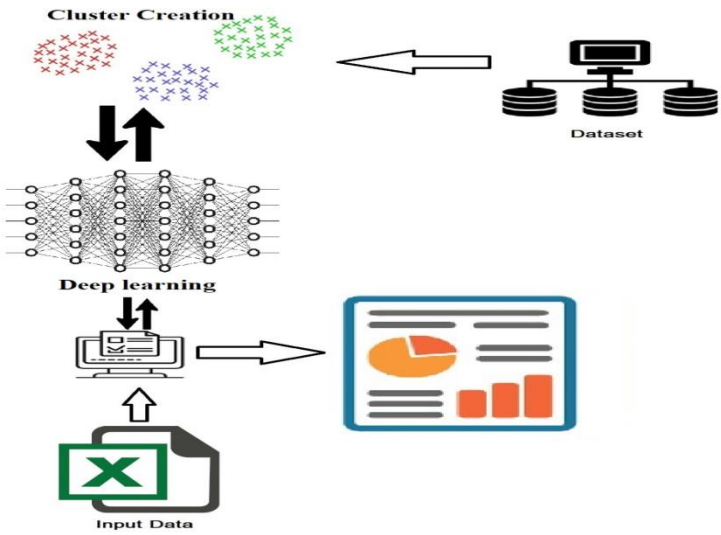

Fig2: Proposed System architecture diagram

Different kinds of neural networks may be advanced via the mixture of different factors like community topology,schooling technique and so on. For this test, we had been given

were taken into consideration. Artificial Neural Network and Long Short-Term Memory.

Stage 1: Raw Data: In this stage, the historical stock data is agiated from https://www.quandl.com/data/NSE, and this historical data isutilized for the pre diction of future stock prices.

Stage 2: Data Pre-processing: The pre-processing step includes

- Datadiscretization: Part of data reduction but with particular importanc e especially for numerical data.
- Data transformation: Normalization.
- Data cleaning: Fill inmissing null values.
- Data integration: Integration of data files.

After the dataset is converted into a pure dataset, the dataset isseparated intotraining and testing sets so as to assess. Here, the training values are taken as the more up to date values. Testing data is kept as 5% to 10% of the total dataset.

Stage 3: Feature Extraction: In this layer, only the features which are to be fed to the neural network are chosen. We will choose the feature from Date, open, high, low, close, and volume.

Stage 4: Training Neural Network: In this stage, the data is fed to the neural network and trained for prediction assigning random biases and weights. Our LSTM model is composed of a sequential input ayer followed by 2 LSTM layers and a dense layer with ReLU activation and then finally a dense output layer with a linear activation function.

Stage 5: Output Generation: In this layer, the output valueis shown by the output layer of the ANN, and it is compared with the target value. After the comparison, the error or the difference between the target and derived output which adjusts the weights and the biases of the network.

3.1 Random Forest Algorithm

Random forest is a supervised classification machine learning algorithm which uses ense mble method.

A random forest is made up of numerous decision trees and helps to tackle the problem of overfitting in decision trees. These decision trees are randomly constructed by selecting random features from the given dataset.

Random forest arrives at a decision or prediction based on the maximum number of votes received from the decision trees. The outcome which is arrived maximum number of times through the numerous decision trees is considered as the final outcome by the random forest.

Algorithm for RandomForest

Step 1: Start with the selection of random samples from a given stock dataset.

Step 2: Construct a decision tree by specifying the condition for every sample of stock price.

Step 3: Assigning each data point to the closest cluster.

Step 4: Compute cluster centroids.

Step 5: Re-assign each point to the closest cluster centroid.

Step 6: Select the most voted prediction result as the final prediction result.

3.2 LSTM Algorithm

Long Short-Term Memory is a Recurrent Neural Network that has feedback connection in its architecture. It has an advantage over traditional neural network because of its capability to process entire sequence of data. LSTM is very popular in sequence prediction problems because they're able to store past information.

Algorithm for LSTM

Step 1: Fetch past data of stocks and computation of sigmoid function.

Step 2: Extraction of last n days data to detect current state.

Step 3: Define output by considering Data in current cell state.

3.3 Linear Regression Algorithm

Linear regression is the analysis of two seperate variables to define a single relationship and it is a useful measure for technical and quantitative analysis in financial markets. One is predictor or independent variable and other is response or dependent variable. It looks for statisticalrelationship but not deterministic relationship.

Algorithm for Linear Regression

Step 1: Analyzing the correlation and directionality of the stock data.

Step 2: Estimating the stock data model from the price.

Step 3: Evaluating the validity and usefulness of the stock model.

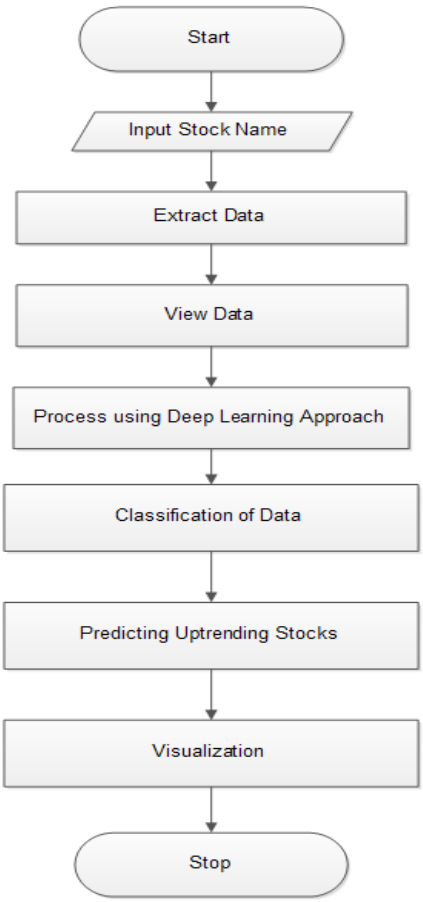

Fig 3. Indicates flow chart of the proposed work

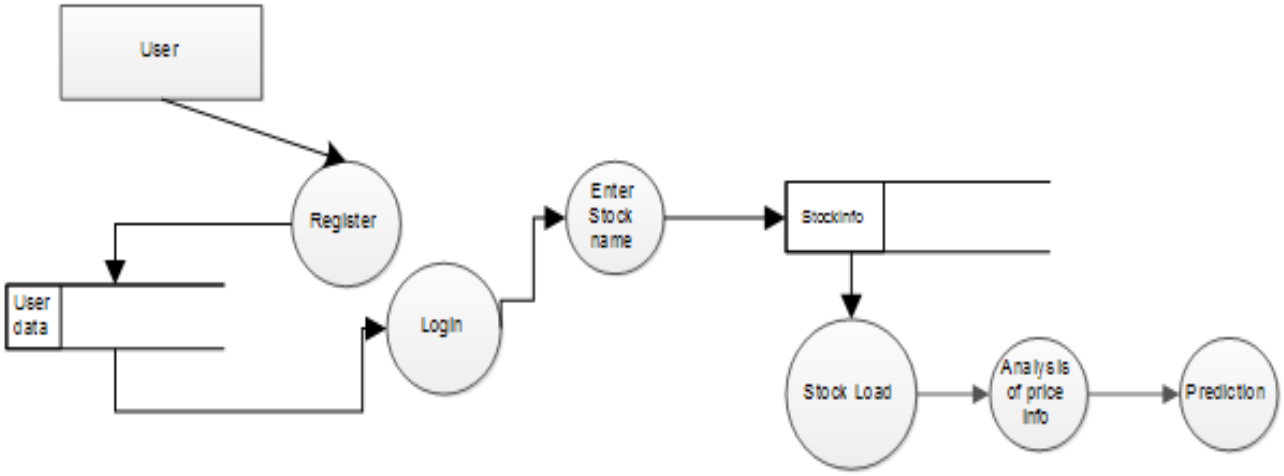

Fig 4. Indicates Data flow diagram.

To understand the mathematics behind RNN, have a look at the below image. As discussed inside the first heading, output depends on both current and past inputs. Let $\mathbf{I_1}$ be the first inputwhose dimension is **n*1** where n is the length of column. $\mathbf{S_0}$ be the hidden state to the first RNN cell having 4neurons. For each cell, input hidden state should be one previous. For the first

cell initialize $\mathbf{S_0}$ with zeros or somerandom number because no previous state is seen. **U** be another matrix of dimension **d*n** where **d** is the number ofneurons in the first RNN cell and **n** is the input columns of data. **W** is another matrix of dataframe whose dimension is**d*d**. **b** is bias whose dimension is **d*1**.

3.4 Parameters and Gradients

Parameters in the RNN are **U, V, b, c, W**are shared among all the RNN cells. Parameters are learnable and are responsible for training the model. At each time step, the loss is computing and is backpropagated through the gradient descent algorithm.

3.5Gradient of loss with respect to V

Gradient represents the slope of tangent and points in the direction of the greatest rate of increase of function. From the loss, it means cost function or error. Move is made opposite to the direction of the gradient of the loss with respect to V. Mathematically new value of V is obtained as shown in equation (1)

$V_{new} = V_{old} - \eta \frac{d(L)}{d(V)}$, ... (1)

where**d(L)/d(V)**is the sum of all losses obtained from time steps.

3.6 Gradient of loss with respect to W

W is multiplied by **S**. In order to calculate derivative of loss with respect to weight at any time step, the chain rule is applied to take into consideration all the path to reach W from $\mathbf{S_n}$ to $\mathbf{S_0}$. This means that due to any of the wrong S_n, W is affected. In other words, some wrong information came from some hidden state which leads to loss. Mathematically, weight is updated as shown in equation (2) below.

$W_{new} = W_{old} - \eta \frac{d(L)}{d(V)}$ ..... (2)

3.7 LSTM (Long Short-Term Memory)

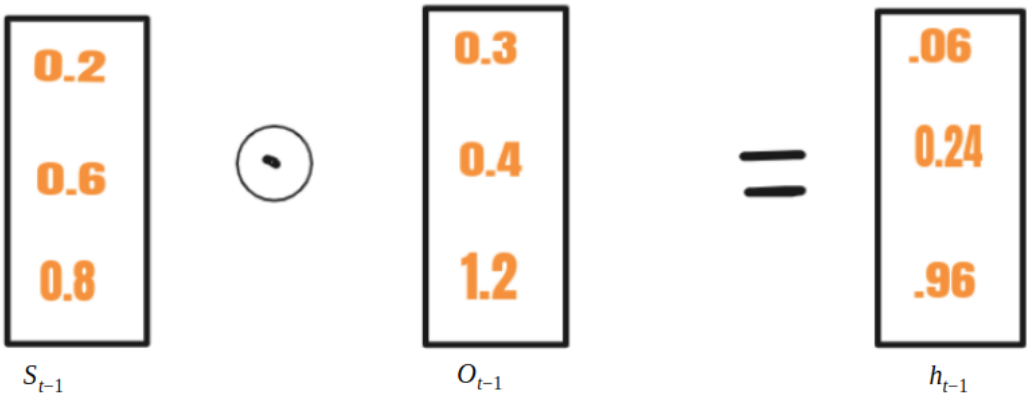

Fig 5: Indicates the strategy for selective write, read and forget.

In RNN, $\mathbf{S_{t-1}}$ is fed along with $\mathbf{x_t}$ to a cell whereas as shown in Fig 5, in LSTM $\mathbf{S_{t-1}}$ is transformed to $\mathbf{h_{t-1}}$ using another vector $\mathbf{O_{t-1}}$as shown in the below equations (3) and (5) respectively. This process is called **selective write**as shown in Fig 6. Mathematical equations for selective write are as below

$O_{t-1} = \sigma(U_o x_{t-1} + W_0 h_{t-2} + b_0)$ ..... (3)

$H_{t-1} = S_{t-1} * O_{t-1}$.....(4)

O_t = output gate .....(5)

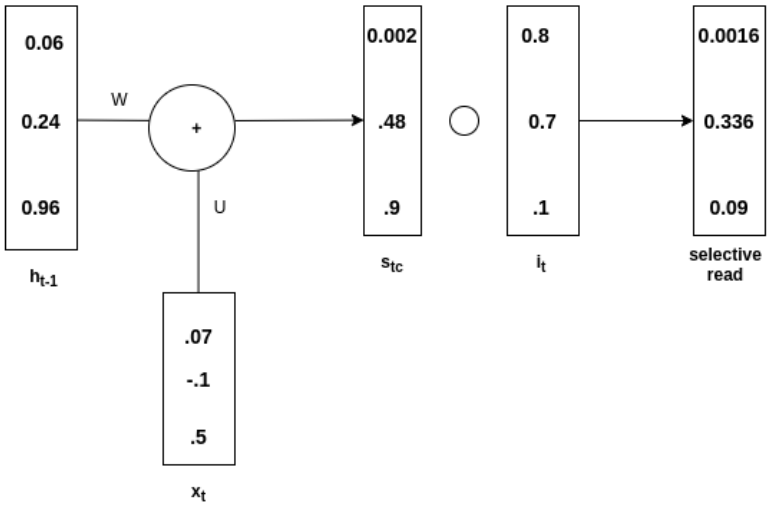

Fig 6: Indicates selective methodology.

As shown in equation (4), $\mathbf{h_{t-1}}$ is added with $\mathbf{x_t}$ to produce s_t. Then Hadamard product of (written $\mathbf{s_{tc}}$ in the diagram) and it is made to obtain $\mathbf{s_t}$.

This is called an **input gate**. In s_t only selective information goes and this process is called **selective read**as shown in equation (6) and (7). Mathematically, equations for selective read are as below.

$i_t = \sigma(U_i x_t + W_i h_{t-1} + b_t)$.....(6)

Selective read = $s_t * oi_t$.....(7)

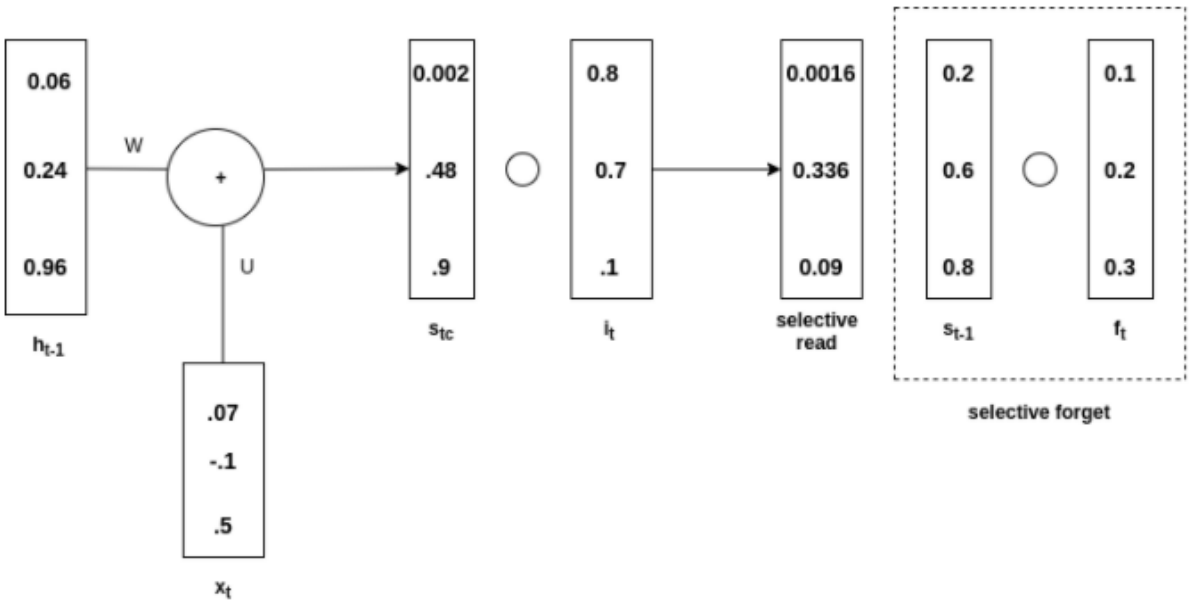

Fig 7: Indicates selective forget.

$\mathbf{s_{t-1}}$ is hadamard product with f_t and is called **selective forget**as shown in Fig 7. Overall $\mathbf{s_t}$ is obtained from the addition of selective read and selective forget.

4. Result Analysis

Implementation is the process of converting a new or a revised system design into an operational one. The objective is to put the new or revised system that has been tested into operation while holding costs, risks, and personal irritation to the minimum. A critical aspect of the implementation process is to ensure that there will be no disrupting the functioning of the organization. The best method for gaining control while implanting any new system would be to use well planned test for testing all new programs. Before production files are used to test live data, text files must be created on the old system, copied over to the new system, and used for the initial test of each program.

The main objective of our dissertation is to develop a more adaptive and effective stock prediction system by applying machine learning techniques. The survey papers prove the successfully of our

proposed approach. A systematic prediction tool is developed could be used to assist invested make more accurate decision in their stock market investment. Our prediction system integrates the stock movement forecasting and stock price forecasting.

In this application, front end has been developed using HTML, CSS, JavaScript with bootstrap framework. The back end has been developed using C# and MySQL as relational database. The dataset is collected via nsepy API.

In addition, numbers of visualization are provided to enhance our system. The models using the features from these external sources along with the traditional stock market data improve the performance for the stock market prediction.

Fig 8: Homepage

The above Fig 8 indicates the home page/landing page where user can opt between Register page or Login page.

Fig 9: Linear Regression Analysis Graph of TCS share

The above Fig9shows the graphical representation of TCS (Tata Consultancy Services) considering the historical data of the TCS share collected from NSE (National Stock Exchange).

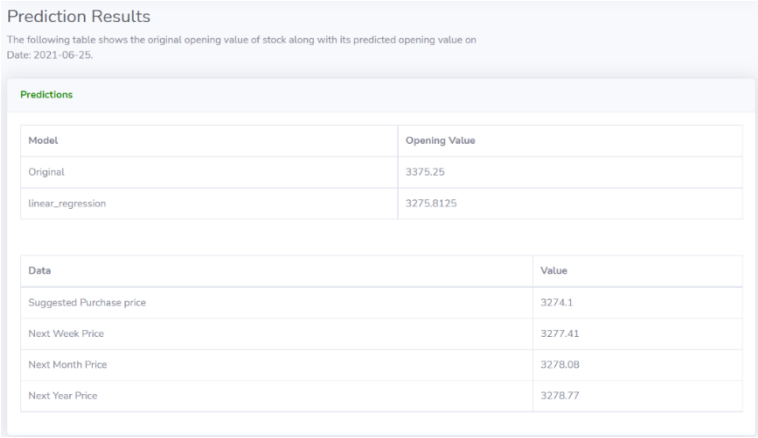

Fig 10: Linear Regression Prediction Result of TCS Share

The above figure 10 shows the weekly, monthly and yearly prediction result by using Linear Regression algorithm. From the above graph, considering the predicted result, the user/trader can enter a trade in live market at suggested price in order to minimize losses.

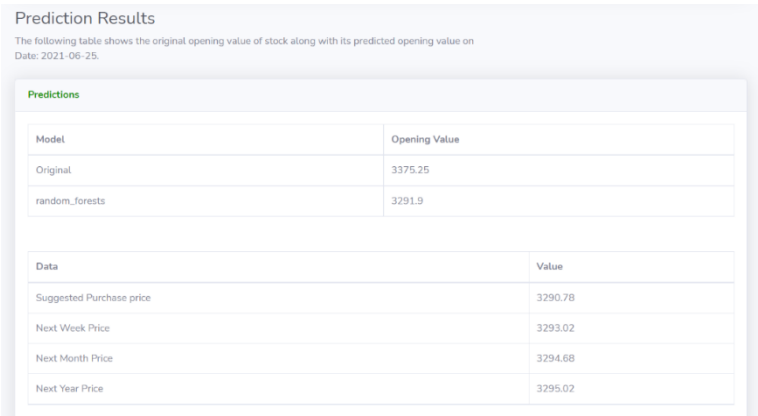

Fig 11:LSTMPrediction Result of TCS Share

The above figure 11shows the weekly, monthly and yearly prediction result by using Random Forest algorithm. From the above graph, considering the predicted result, the user/trader can enter a trade in live market at suggested price in order to minimize losses.

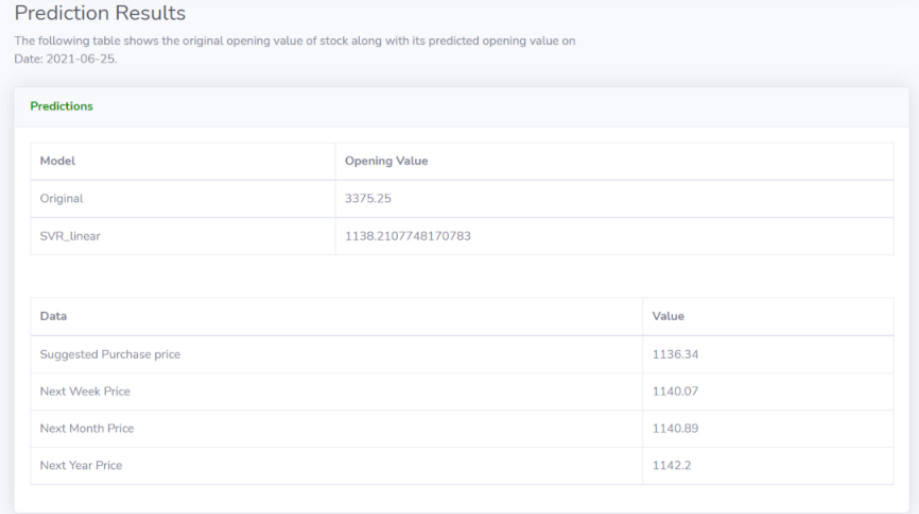

Fig 12: Random Forest Prediction Result of TCS Share

The above figure 12 shows the weekly, monthly and yearly prediction result by using RNN-LSTM algorithm. From the above graph, considering the predicted result, the user/trader can enter a trade in live market at suggested price in order to minimize losses.

Fig 13: Indicates actual TCS share price.

The above figure 13shows the real time candlestick chart of TCS (Tata Consultancy Services) share price captured from Zerodha Kite Application. The red candle shows the down trend of the price. The green candle shows the uptrend of the price.

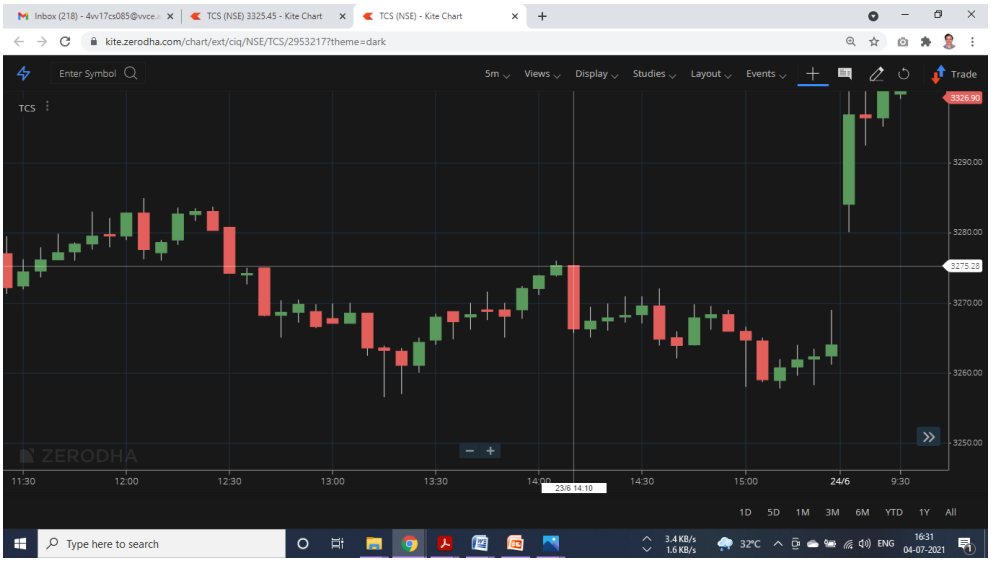

Fig 14: Indicates actual TCS share prices.

The above figure 14shows the real time candlestick chart of TCS (Tata Consultancy Services) share price captured from Zerodha Kite Application. The red candle shows the down trend of the price. The green candle shows the uptrend of the price.

5. Comparative Analysis

The below table shows the contrast between existing methodologies of the analysis of stock prediction and the proposed methodology.In this project the lowest, the highest and the average value of the stock market in the last d days are used to predict the next day's market value.

Linear Regression is an approach for predictive modelling to showcase relationship between scalar dependant variable 'Y' and one more independent variable 'X'.

RNN & LSTMs are explicitly designed to avoid long-term dependency problem. Remembering information for long period of time as well as easy to learn is practically their default behavior.

The random forest algorithm follows an ensemble learning strategy for classification &regression.The random forest takes the average of the various subsamples of the dataset, this increases the predictive accuracy and reduces the over-fitting of the dataset.

The stock market data have been extracted from NSE Stock Market dataset.

The graphical visual obtained from web application gives the clarity on behavior of market thus helping us understand price action. The below Table 2 shows the brief description of comparison between the existing system and proposed system.

EXISTING SYSTEM	**DRAWBACKS**	**PROPOSED SYSTEM**
An artificial neural network with backpropagation algorithm	Neither development nor pruning techniques have endeavoured for the determination of stock price.	Applying ANN tests on real-time data and not concentrating on a particular sector.
Random forest Algorithms, support vector machine	Previous years' dataset is considered. No real-time data is used for predicting stocks.	They are considering more parameters to obtain higher accuracy. These Algorithms are Implemented on public comments to understand the relationship between customer and employee.
Root Mean Square Error (RMSE), the difference between the target value and the fetching result value is reduced by using RMSE value. Recurrent Neural Network, Long Short-Term Memory	Does not focus on events in the environment, like news or social media. It exploits only one data source. Thus it is highly biased.	Future enhancement includes comparing the accuracy of LSTM with other prediction algorithms. LSTM gives more accurate value when compared with other prediction algorithms.

Linear regression, moving average	Used for limited company stocks More amount of data is not considered for prediction	With the moving average Algorithm, it is shown that the Algorithm understands the past data and does not focus on the seasonal part. Therefore, accuracy is more.
An artificial neural network, multiple linear regression, Bayesian Algorithm	Using Bayes theorem bias is found. Predicted price is fluctuating they are not constant	As Bayes theorem provides bias in stock prices, so the focus of the Algorithm can be moved to Ann using this seasonal stock prices can be predicted.
SVM, ANN SVM (Support vector Machine)	Only sentiment data are used from various news and Twitter resources, and no historical data are considered for predictions.	Not only concentrating on the positive or negative outcome of a particular tweet but also considering historical data as well.
LSTM Neural Network Algorithm	Only by considering the effect of historical data on price movements is too singular and may not be able to analyze the price on a particular day precisely.	They are adding information expectations identified with stock-related news and fundamental data, to improve the security and precision of the model on account of a significant occasion.
ARIMA, Facebook Prophet, Recurrent Neural Network LSTM	Models did now not perform appropriately in instances in which inventory costs are low or pretty unstable. The fashions that used textual content (financial facts articles) as a part of the entries have finished very well, on the equal time as fashions that predicted destiny inventory fees through historical stock charges motive excessive percent errors.	To confirm if there is any impact or effect on the stock cost of a specific organization because of the stock value changes for different organizations. By utilizing the two opinions and authentic information, we can anticipate the exact stock cost of an organization.
Regression-Based Model, LSTM	Sentiment analysis is not used. The larger dataset is not considered.	In destiny, the accuracy of the stock market prediction device may be further advanced through the usage of a miles huge dataset than the first-class being applied presently. Sentiment assessment via Machine Learning on how records affect the stock charges

		of a company is also an auspicious place.
Random forest, SVM, sentiment analyzer tools	Considering only twitter data for sentiment analysis hence, not all the people who trade in stocks share their opinions on Twitter.	Further, other news resources for sentiment analysis can be used. Along with this, historical data can be used to obtain high accuracy.

Table 2. Comparison between the existing system and proposed system.

6. CONCLUSION

In this work, it can be concluded that the analysis of the stock market or the prediction of the stock price is a difficult task considering the factors affecting the movement of the market such as sentimental decision made by the trader or the pandemic situation such as covid19 which can alter the direction of price action in the market. In order to avoid such anomalies or difficulties, the analysis should be carried out more precisely considering technical, fundamental as well as emotional factors which can directly or indirectly affect various sectors such as financial, agriculture, mining, IT which in turn enables fluctuation in the particular stock price. Hence considering the latest technologies such as ANN can be useful in analysingthemovement of the stock market.

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