

Framework for Stock Price Prediction using ML and React JS

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Abstract: *The stock market is available to every person and they can buy, the process of predicting the next day price of stock is easy to check, sell, buy to companies. The stocks we call as equities which is technical word, represent ownership in the company. Every as their own stock and every person can buy it this platform is responsible for giving accurate result. By using different algorithms we can predict the stock price. The ML algorithm will predict the price of stock based on the past data Investment firms, hedge funds. A very important data will be the process of good prediction of stock price and company performance data to loaded to the machine learning algorithms to process. This project uses a algorithm was lstm is deep learning algorithm, to predict using ml the check the feature day closing price of the given stock.*

Keywords: Stock Market

I. INTRODUCTION

A stock price will predict the process of predicting the stock price with help of previous data and previous data will be used to predict future data. And based on the prediction we can invest in different. usually made with an investment. the every company will make the share price available for every person.. The stocks we call as equities which is technical word, represent ownership in the company. Every as their own stock and every person can buy it this platform is responsible for giving accurate result. By using different algorithms we can predict the stock price. the ML algorithm will predict the price of stock based on the past data Investment firms, hedge funds and even individuals have been using financial models to better understand market behaviour and make profitable investments and trades. This project will make the user more interactable and the prediction stock price is accurate. The LSTM is the more popular algorithm. and it mainly used to the graph based prediction. And the stock is graph based prediction

II. LITERATURE SURVEY

Y. Mäkinen, & et al., (2021)^[1] : Stock market is basically nonlinear in nature and the research on stock market is one of the most important issues in recent years. People invest in stock market based on some prediction. For predict, the stock market prices people search such methods and tools which will increase their profits, while minimize their risks. Prediction plays a very important role in stock market business which is very complicated and challenging process. Employing traditional methods like fundamental and technical analysis may not ensure the reliability of the prediction. To make predictions regression analysis is used mostly. In this paper we survey of well-known efficient regression approach to predict the stock market price from stock market data based. In future the results of multiple regression approach could be improved using more number of variables. **Keywords:** Stock Market, Prediction, Data Mining, Multiple Regression, polynomial regression, linear regression

Y. Zuo & et al., (2020)^[2] : A stock movement prediction method is presented using quarterly financial ratio data from Hong Kong companies from the period, 2011-2014. We found that the accuracy of price movement prediction using Random Forest method over multiple quarters to be fairly weak. However we were able to predict with high accuracy in the last quarter of 2014 and not in other years. We attribute this not to the superiority of the method but to the non-stationary nature of the price signals.

Sadia, K. H & et al., (2020) [3] : Forecasting the stock market movements is an important and challenging task. As the Web information grows, researchers begin to extract effective indicators (e.g., the events and sentiments) from the Web to facilitate the prediction. However, the indicators obtained in previous studies are usually based on only one data source and thus may not fully cover the factors that can affect the stock market movements. In this work, to improve the prediction for stock market composite index movements, we exploit the consistencies among different data sources, and develop a multi-source multiple instance model that can effectively combine events, sentiments as well as the quantitative data into a comprehensive framework. To effectively capture the news events, we successfully apply a novel event extraction and representation method. Evaluations on the data from the year 2015 and 2016 demonstrate the effectiveness of our model

Ishita Parmar & et al., (2020) [4] : Learning Analytics (LA) has a significant impact in learning and teaching processes. These processes can be improved using the available data retrieved from students' activity inside the virtual classrooms of a (LMS). This process requires the development of a tool that allows one to handle the retrieved information properly. This paper presents a solution to this need, in the form of a development model and actual implementation of an LA tool. Four phases (Explanation, Diagnosis, Prediction and Prescription) are implemented in the tool, allowing a teacher to track students' activity in a virtual classroom via the Sakai LMS.

Yaohu Lin & et al., (2019) [5] : Stock market forecasting is a knotty challenging task due to the highly noisy, nonparametric, complex and chaotic nature of the stock price time series. With a simple eight-trigram feature engineering scheme of the inter-day candlestick patterns, we construct a novel ensemble machine learning framework for daily stock pattern prediction, combining traditional candlestick charting with the latest artificial intelligence methods. Several machine learning techniques, including deep learning methods, are applied to stock data to predict the direction of the closing price. This framework can give a suitable machine learning prediction method for each pattern based on the trained results. The investment strategy is constructed according to the ensemble machine learning techniques. Empirical results from 2000 to 2017 of China's stock market confirm that our feature engineering has effective predictive power, with a prediction accuracy of more than 60% for some trend patterns.

III. METHODOLOGY

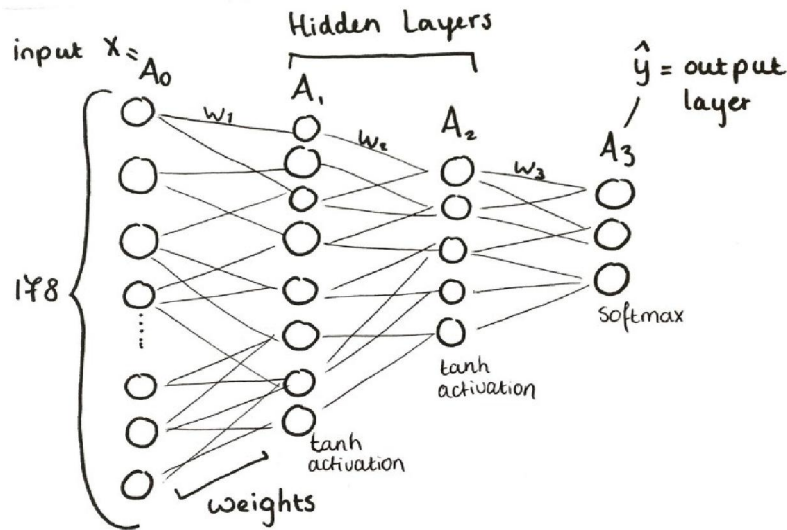
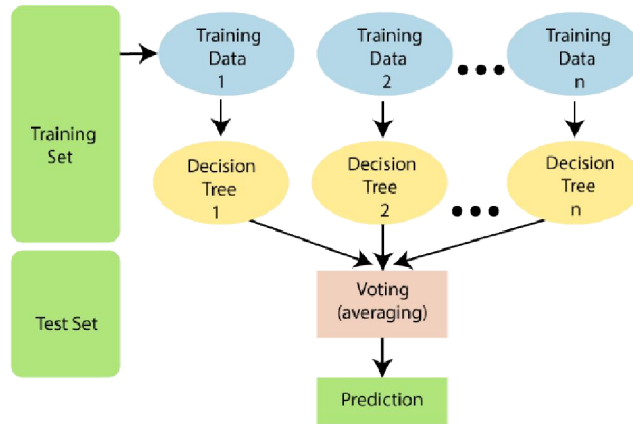
TABLE 1: Kernel functions

Kernel Functions	Formula
Linear Function	$K(x_i, x_j) = \langle x_i, x_j \rangle$
Polynomial Function	$K(x_i, x_j) = (\langle x_i, x_j \rangle + 1)^d$
Gaussian Function	$K(x_i, x_j) = \exp(-\gamma \ x_i - x_j\ ^2)$

The kernel function will make the process of prediction and the formula used to predict the epoch with RMSE. the function with the process of handling the main process to check the prediction price

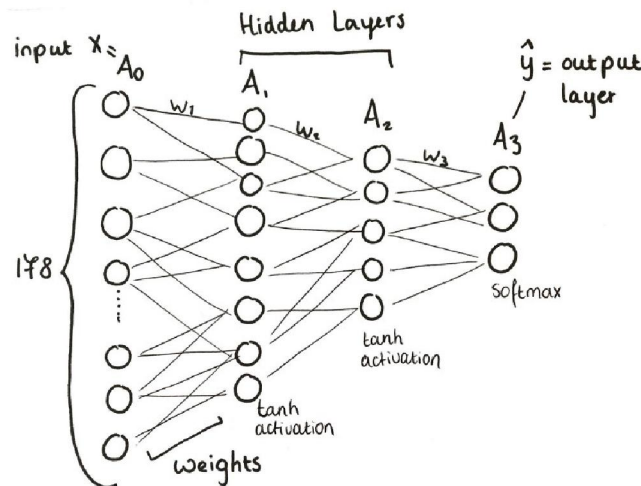
3.1 RF

The RF algorithm will make the prediction . based on the tree structure . it checks if the number is greater it moves to node else it moves to next node the process is done till end . the which we are loading was very big in stock , so instead of RF we are LSTM. Make sure algorithm is over fitting are not . if algorithm is over fitting make sure re build the model from start.



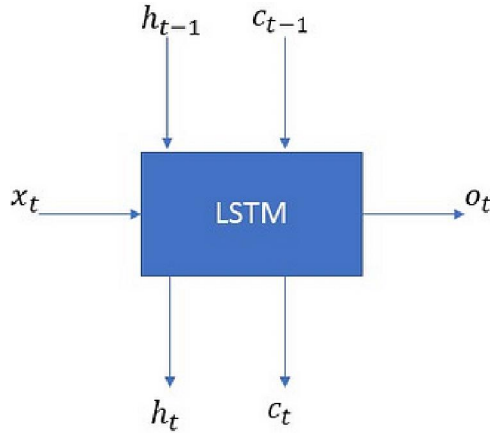
3.2 LSTM

THE LSTM will is deep learning algorithm and the process of predicting the stock price is in neural network the reason for using LSTM was it is implemented using neural network. The LISTM use introduced in 1997 and it used to note the small changes in ever move.



3.3 LSTM Equations

The LSTM has the full detailed formula with the process of handling the result in the LSTM X(T) IS THE INPUT the c and h used to generate the LSTM.



$$f_t = \sigma_g (W_f \times x_t + U_f \times h_{t-1} + b_f)$$

$$i_t = \sigma_g (W_i \times x_t + U_i \times h_{t-1} + b_i)$$

$$o_t = \sigma_g (W_o \times x_t + U_o \times h_{t-1} + b_o)$$

$$c'_t = \sigma_c (W_c \times x_t + U_c \times h_{t-1} + b_c)$$

$$c_t = f_t \cdot c_{t-1} + i_t \cdot c'_t$$

$$h_t = o_t \cdot \sigma_c(c_t)$$

σ_g : sigmoid

σ_c : tanh

. : element wise multiplication

f_t is the forget gate

i_t is the input gate

o_t is the output gate

c_t is the cell state

h_t is the hidden state

Example: Sentiment Analysis using LSTM

The sentiment analysis with makes the and process the every single word in input and passing to the LSTM for the process of the main thing and worst thing will make the prediction of stock more accuracy.

IV. TESTING THE MODEL

Testing the model by giving the data to the model and if the prediction accuracy is high which is good model . and the accuracy is less the 50 we have re build the model based on the model we have to load the data and predict the price . use the different techniques .

4.1 Prediction

The prediction of stock price prediction with help of the machine learning and process is done by the LSTM algorithm . and the prediction process is done by the process of marketing in stock exchange. The price of stock prediction based on the past data predicting the future price of stock.

4.2 Performance Evaluation

The accuracy of the model is very in important. lets consider based on the important feature in dataset. If the model accuracy is more than 70 % which is good model . more then 90% is over fitting . less then 50% poor model we have to rebuild it.

V. IMPLEMENTATION

5.1 Dataset Collection

The data is collected different resource and process of extracting the data in web using we scraping and getting data from database and feedback forms. The collecting the data is very important and use if wisely to make the prediction high .

5.2 Data Cleaning

The data cleaning is the process of removing the duplicates and handling the missing data. Which improves them model accuracy and removing the unwanted fields . the model will not handle the large amount data . if the data is large we just move to deep learning.

5.3 Feature Extraction

The all features in dataset may not important for prediction and feature selection algorithm will make the prediction of important algorithm . it will removes all the algorithms. The feature that we extracting will make the huge difference in stock price prediction.

5.4 Model Training

The process of loading the dataset to ML algorithm and ther process of making the value to the algorithm and the dataset is splitting into two parts test and train . in this application I am using LASTM algorithm .

5.5 RF

The RF algorithm will make the prediction . based on the tree structure . it checks if the number is greater it moves to node else it moves to next node the process is done till end . the which we are loading was very big in stock , so instead of RF we are LSTM. Make sure algorithm is over fitting are not . if algorithm is over fitting make sure re build the model from start.

5.6 Performance Evaluation

The evaluating the model with loading different inputs . The accuracy of the model is very in important. lets consider based on the important feature in dataset. If the model accuracy is more than 70 % which is good model . more then 90% is over fitting . less then 50% poor model we have to rebuild it. In this project, we predicting the price based on the past data and tis is a full stack web application .with react js and node js for predicting of the closing stock price using LSTM ,rf , feature selection based on the data and algorithms for prediction

We want to add sentiment analysis for better analysis .The process of a predicting the price of stock is done by the sequence of the formula . The formula is shown above (P/E x EPS = Price). According to this formula, we can able to get accurately predict a stock's future P/E and EPS, we can know the future price with help of past data The model which makes the prediction in process of user. therefore, the purpose of machine learning testing is, first of all, to ensure that this learned logic will remain consistent, nomatter how many times we call the program in the testing

VI. RESULTS

TABLE 2. model: "sequential_1"

Layer (type)	Output Shape	Param #
lstm_2 (LSTM)	(None, 60, 100)	40800
lstm_3 (LSTM)	(None, 100)	80400
dense_2 (Dense)	(None, 25)	2525
dense_3 (Dense)	(None, 1)	26

TABLE 4. Predictions

Date	Close	predictions
2022-12-09 00:00:00-05:00	142.160004	142.238754
2022-12-12 00:00:00-05:00	144.490005	141.525970
2022-12-13 00:00:00-05:00	145.470001	143.456955
2022-12-14 00:00:00-05:00	143.210007	144.015381
2022-12-15 00:00:00-05:00	136.500000	142.440475
2022-12-16 00:00:00-05:00	134.509995	137.517014
2022-12-19 00:00:00-05:00	132.369995	136.311127
2022-12-20 00:00:00-05:00	132.300003	134.263855
2022-12-21 00:00:00-05:00	135.449997	134.147293

Stock price prediction using ML it helps the company to grow and the grow fast based on the market rate . the stock market it a available to every person and they can buy, the process of predicting the next day price of stock . buy and sell to all the company the we want . The stocks we call as equities which is technical word, represent ownership in the company. Every as there own stock and every person can buy it this platform is responsible for giving accurate result .By using different algorithms we can predict the stock price . the ML algorithm will predict the price of stock based on the past data Investment firms, hedge funds and we understand profit in stock price in future and grow of stack price it improve wealth of individual person.

VII. CONCLUSION

The stock price prediction price to know the price of future stock price and fully based on future data with ML , react js and node . the prediction of stock with the data and the data is getting from the different source and database . we can get the data from the google and predict the data based on that .We want to add sentiment analysis for better analysis .The process of a predicting the price of stock is done by the sequence of the formula .the formula used is $p/e \times eps = price$ and based on the formula we can predict the stock price and price is predicted based on the past dataset with is getting in google.

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