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THE STOCK MARKET PREDICTION SYSTEM

Dr.C.K. Gomathy[1], Mr. Linganna. K[2], Mr. Reddy Prakash. E[3]

Abstract - *In stock market prediction, the aim is the future value of the financial stocks of a company. The recent trend in stock market prediction technologies is the machine learning to predict stock values. Factors considered are open, close, low, high, volume.*

Key Words : *Simple moving average, long short time memory, SMA&STM.*

1.INTRODUCTION

In present days so many people's are intrested in investing money in stock market for earning more in short period of time.

Here ,in stock market consist of many number of company shares along with prices in stock market every minute stock price will changes depending on the company environemt and country economic structure decisions. In stock market there are many broker's for handing the stocks buying and selling between the clients and company. In previous year's there is difficult to predict the stock market because lack of technology and knowledge but in present days technology will increases day by day for that we can predict the stock market easily when compare to past here we can predict stock price by analyzing the previous data by using machine learning techniques. From these techniques we can use neural network(it's means that it is interconnected with networking it look like human neural brain structure) and simple moving average meethod.

2. LITERATURE SURVEY

Money related trade judgment making is a strengthening and difficult errand of fiscal data guess. Figure about securities trade with high exactness improvement return advantage for examiners of the stocks. In perspective on the snare of budgetary trade financial data, expansion of productive models for forecast conclusion is very difficult, and it must be precise. This consider attempted to make models for guess of the securities trade and to pick whether to buy/hold the stock using data mining and AI techniques. The AI framework like Naive Bayes, k-Nearest neighbors (k-NN), Support Vector Machine(SVM), Artificial Neural Network(ANN) and Random Forest has been used for progressing of gauge model. Particular pointers are resolved from the stock pricesset up on timetable data and it is used as commitments of the proposed guess models. Ten years of securities trade data has been used for sign gauge of stock. Based on the instructive accumulation, these models can make buy/hold signal for monetary trade as a yield. The rule target of this errand is to deliver yield signal(buy/hold) as per customers essential like mean be contributed, time term of endeavor, least advantage, most prominent hardship, using data mining and AI frameworks. Forecasting the way of stock prices is a widely deliberate subject in many fields including trading, finance, statistics and computer science. Depositors in the stock market can maximize their yield by export or selling their investment if they can determine when to enter and exit a position. Specialized traders typically use essential and/or technical analysis to inspect stocks in making venture decisions.

The objective function is to maximize medium to longer term profits based on S&P500 stock market index. The inputs are the technical pointers data and the economic indicators data. Three models (neural network, soft max logistic regression, decision forest) are then used to predict the buy/sell decisions.

2.1 FEASIBILITY STUDY

To plaid the practicability of the overhead model the given productivity will be plaid and coordinated alongside the graph of the definite company for that period of time and distinguish the patterns. As a future Scope in our project we will further use quantopiana online platform for emerging trading approaches and back testing them, we will use it to advance a plan on quantopian and back test it to check the possibility of the tactic.

3. PROPOSED METHODOLOGY

stock market forecast is a huge subject and has a lot parts on which we can investigation upon, but one object all models have in common is their check on correctness of how well the models practical can fit to a given dataset and is it identical the results and forecasting correctly or not. each model has a few effects in common, they all need a list of companies of any stock exchange to forecast upon the three basic situations of market buy, hold, and sell and to do this the stock market data for each company against their tickers was stored in machine (to avoid larger accessing time) and data manipulations were performed in order to prepare the dataset for additional machine learning classifiers which will ultimately forecast the marks and deliver the output.To plaid the practicability of the overhead model the given productivity will be plaid and coordinated alongside the graph of the definite company for that period of time and distinguish the patterns. As a future Scope in our project we will further use quantopiana online platform for emerging trading approaches and back testing them, we will use it to advance a plan on quantopian and back test it to check the possibility of the tactic.

4. TECHNOLOGIES USED

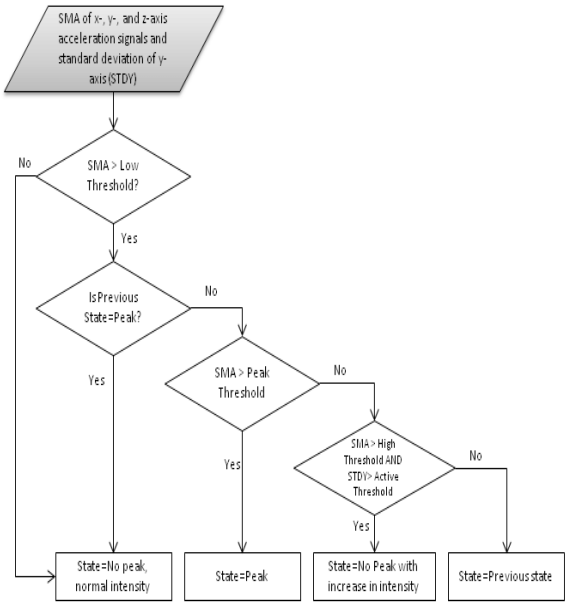
Stock market prediction seems a complex problem because there are many factors that have yet to be assumptions.

Machine learning as such has many models but this paper focuses on two most important of them and made the predictions using them.

4.1 SIMPLE MOVING AVERAGE

Simple Moving Average (SMA): SMA is a technique to identify trends direction for a certain period of time, by looking at the average of all the values within that time period. The number of prices in a time period is selected practically.

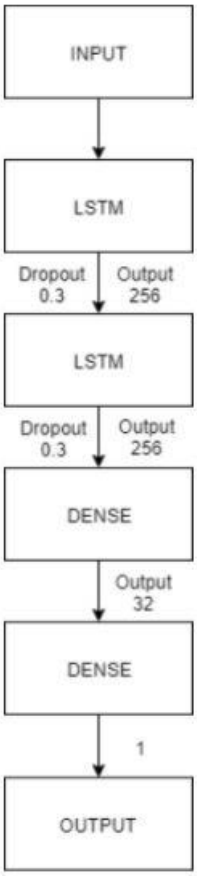
For example, let's assume the closing prices for past 6 days were 12, 10, 11, 20, 7, the SMA would be (12+10+11+20+7)/6 = 10. So the input for our training dataset is the set of prices within a single time window, and label is the computed moving average of those prices.



4.2 LONG SHORT TERM MEMORY(LSTM)

LSTM is the advanced version of Recurrent-Neural-Networks (RNN) where the information belonging to previous state persists. These are different from RNNs as they involve long term dependencies and RNNs works on finding the relationship between the recent and the current information. This indicates that the interval of information is relatively smaller than that to LSTM. The main purpose behind using this model in stock market prediction is that the predictions depends on large amounts of data and are generally dependent on the long term history of the market . So LSTM regulates error by giving an aid to the RNNs through retaining information for older stages making the prediction more accurate. Since stock market involves processing of huge data, the gradients with respect to the weight matrix may become very small and may degrade the learning rate of the system.

The stock market has enormously historical data that varies with trade date, which is time-series data, but the LSTM model predicts future price of stock within a short-time period with higher accuracy when the dataset has a huge amount of data.



This corresponds to the problem of Vanishing Gradient. LSTM prevents this from happening. The LSTM consists of a remembering cell, input gate, output gate and a forget gate. The cell remembers the value for long term propagation and the gates regulate them.

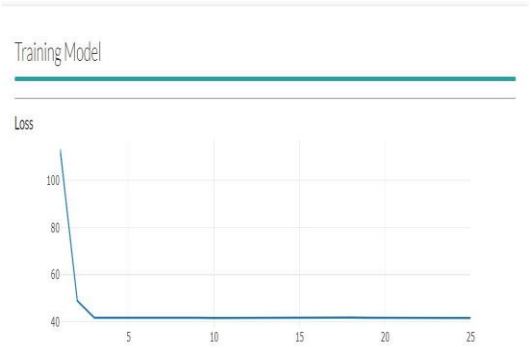
4.2 NEURAL NETWORK

Now that you have the training data, it is time to create a model for time series prediction, to achieve this we will use TensorFlow framework. Sequential model is selected which simply connects each layer and pass the data from input to the output during the training process. In order for the model to learn time series data which are sequential, recurrent neural network (RNN) layer is created and a number of LSTM cells are added to the RNN. Finance is highly nonlinear and sometimes stock price data can even

seem completely random. Traditional time series methods such as ARIMA and GARCH models are effective only when the series is stationary, which is a restricting assumption that requires the series to be preprocessed by taking log returns (or other transforms). However, the main issue arises in implementing these models in a live trading system, as there is no guarantee of stationarity as new data is added.

This is combated by using neural networks, which do not require any stationarity to be used. Furthermore, neural networks by nature are effective in finding the relationships between data and using it to predict (or classify) new data.

Neural Network Based Model Result:



6. SYSTEM ARCHITECTURE

The mobile application is composed of two systems. The first is the mobile application which can used by the organization. Registration is a requirement when using the application.

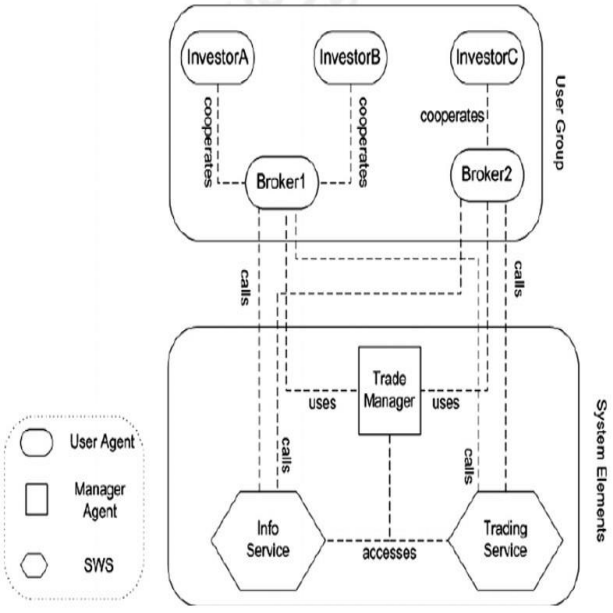
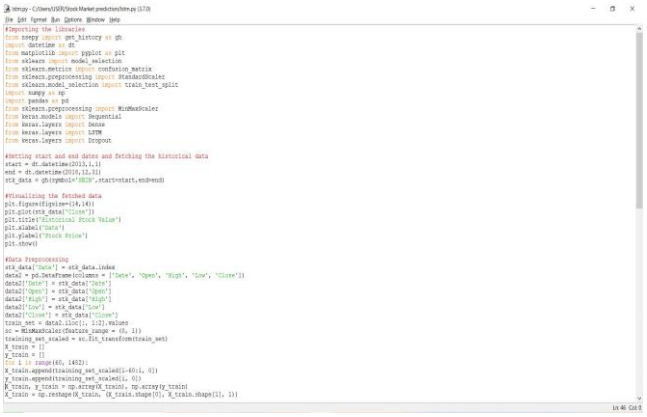
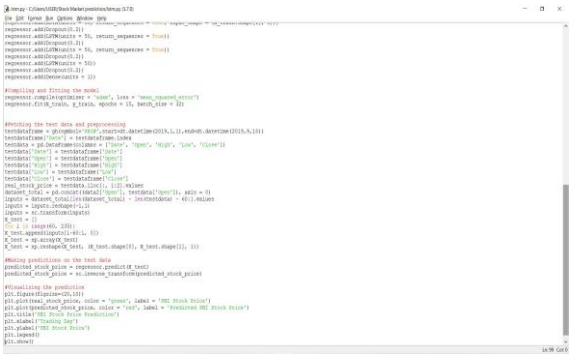


Fig : SYSTEM ARCHITECTURE

The basic personal information of the user will be stored in a database can be accessed by the organization head. The driver's mobile location will be shared to the system. The second part of the system is the mobile application which is used by the driver.

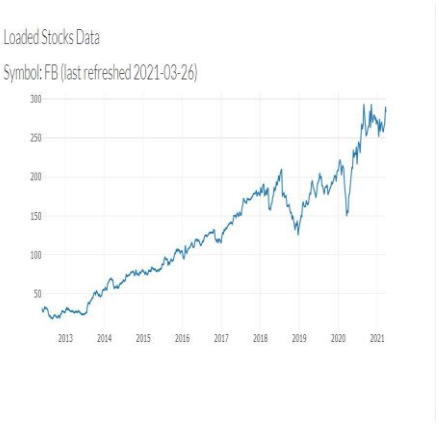
CODE FOR LSTM RECURRENT NEURAL NETWORK



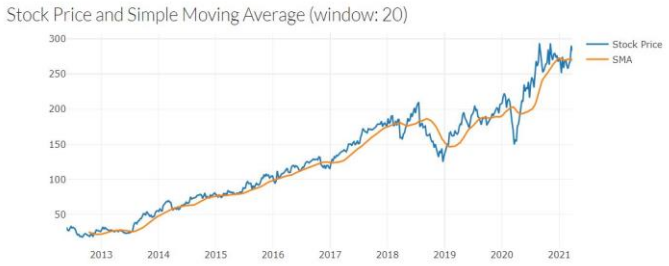


6. WORKING MODEL

Functionalities of both the applications are always related in one or mode ways. This system has many functionalities namely



SMA BASED MODEL RESULT



7. CONCLUSION

Here we use 2 methods in this paper: LSTM andSMA and Neural Network, on the finance dataset. Both the echniques have shown an improvement in the accuracy of predictions, thereby yielding positive results. Use of recently introduced machine learning techniques in the prediction of stocks have yielded promising results and thereby marked the use of them in profitable exchange schemes. It has led to the conclusion that it is possible to predict stock market with more accuracy and efficiency using machine learning techniques. In the future, the stock market prediction system can be further improved by utilizing a much bigger dataset than the one being utilized currently. This would help to increase the accuracy of our prediction models. Furthermore, other models of Machine Learning could also be studied to check for the accuracy rate resulted by them.

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AUTHORS PROFILE

Dr.C.K.Gomathy is assistant professor in computer science and engineering at Sri Chandrasekharendra SaraswathiViswa Mahavidyalaya, Enathur, Kanchipuram, India. Her area of intrest lies in Software Engineering, Web sServices, Knowledge Management Domain.

Karanam Linganna, student, B.E. Computer Science and Engineering, SCSVMV.

Eragam Reddy Reddyprakash Reddy, student, B.E. Computer Science and Engineering, SCSVMV.