

# Stock Market Price Prediction Using Recurrent Neural Network

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**Abstract:** Trading is a risky and major investment activity. Initially many investors tried creating a market analysis based on calculations which would help them predict the market rate so that it will be easy to decide whether to invest or not to invest or is it the correct time to invest. Predicting the price of the stock following economy development all over, is one tedious yet important job to carry out. Machine learning can be used to help the investors with this. I.e. Investors would be interested to select the market or invest in a market which will grow exponentially day by day with respect to price. Collecting the past data and predicting future. This has been our main moto which can be possibly achieved by using ML-DL model.

**Keywords** —ANN, LSTM, RNN, ARIMA, AR.

## I. INTRODUCTION

Starting late evaluating stock costs is expanding in additional consideration, maybe in perspective of the way in which that if the costs are successfully foreseen the merchants may have appropriate heading while at the same time taking choices. The benefit returns acknowledged from securities exchanges intensely rely upon market investigation. On the off chance that by any shot any formation be made which can dependably figure the costs of the spirited protections trades, it would make the proprietor of the framework well off. In addition, such expectations will help the auditor of the market in orchestrating medicinal measures in phenomenal cases.

With the desire for anticipating business sector's developments, use of neural systems in security exchanges forecasting problems is extremely reassuring a direct outcome of a portion of their extraordinary characteristics.

Right off the bat, neural systems display striking ability to separate setting from tangled or evaluated data. They are used to determine examples and recognize patterns that are too tangled to even consider being in any capacity be fathomed by either people or other customary PC forms.

Also, neural systems display a nonlinear nature and are supported over the customary straight models.

A **recurrent neural network (RNN)** is one of the types of Artificial Neural Network which has a directed graph having connections which are directed, and connecting the nodes along a sequence. This makes it have a dynamic behavior along temporal side. Here the connections don't just jump further to the next nodes. The neural networks here use their previous neurons or states to produce a sequence of correct output. It has two classes of network which has akin structure. They are Finite and in finite impulse and execute temporal dynamic behaviors.

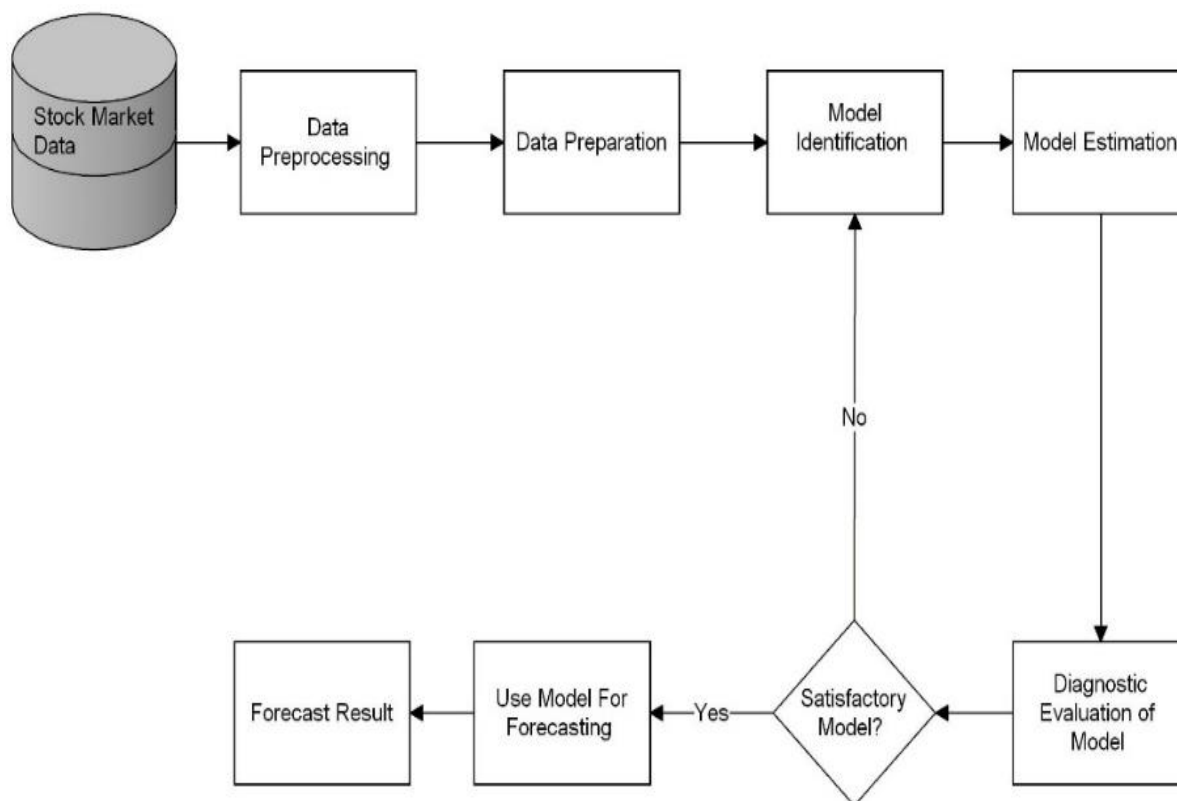
## II. RELATED WORKS:

In existing system, the author has applied kNN algorithm and non-linear regression to predict stock price. A process for five companies was done using real data. A vigorous model was constructed. Results showed that the algorithm was working stable but had a minimum error ratio and also that the predicted results matched actual prices very closely.

### III. PROPOSED SYSTEM

In stock market, there may be a very large number of unknown factors which can influence stock price, therefore there wasn't any relation could be found among the factors and the price. Hence we use the results of previous prices and pass it to the model implemented and finds the predictions.

### IV. SYSTEM DESIGN



**Fig.1 System Architecture**

The above figure gives us the architecture of the proposed system. It takes through the pipeline consisting of methodologies to obtain a forecasting result. Referring (Fig.1) the stock market data is collected and is preprocessed and trained with the selected model for obtaining the satisfactory forecasting result.

Referring (Fig.2), depicts the working of RNN. Few connections are very complicated and might not cooperate in finding out the expressions. Neural networks help us in these problems. It is vigorous enough to establish a connection between input and output without any assumptions.

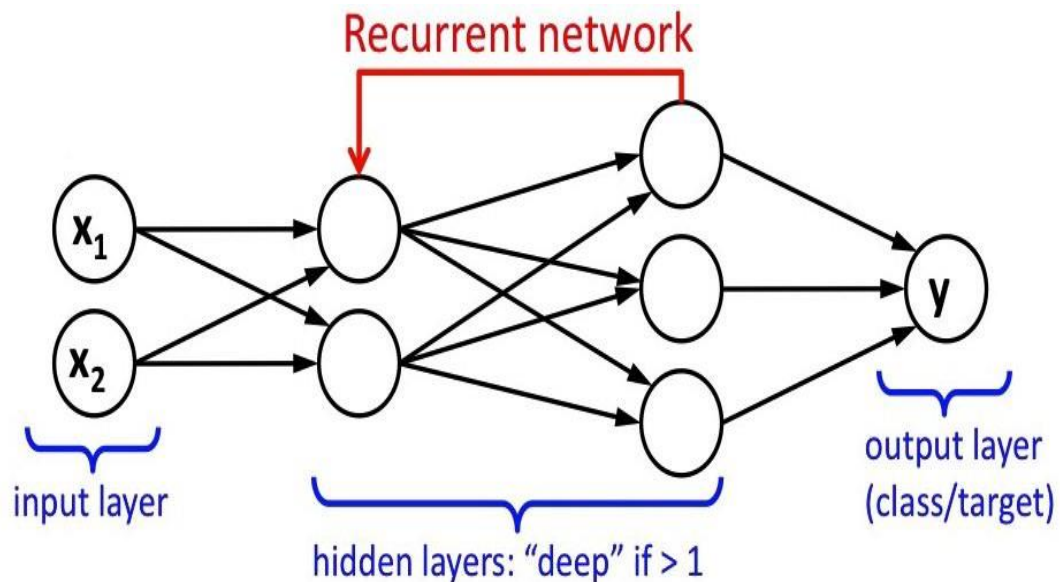


Fig.2 Structure of Neural Network

We used ARIMA and Auto Regression algorithms but they couldn't yield good results. Hence shifted to LSTM algorithm which gave better results.

#### Using Auto Regression and ARIMA:

Autoregressive models and procedures mechanism under the reason that past qualities affect current qualities, which makes the factual system famous for dissecting nature, financial matters, and other time-changing procedures. Numerous relapse models gauge a variable utilizing a straight mix of indicators, while Auto Regressive models utilize a mix of past estimations of the variable. One of the sorts among AR models is ARIMA portrayed underneath.

There are two perspectives to carry out prediction:

Statically and Logically

Arima is done with statistical prediction. It is mainly a time series model.

ARIMA is abbreviated as **Auto regression integrated moving average**. Elaborating further:

**Auto regression:** technique of taking advantage of lagged observation to connect to the current one.

**Integrated:** it is the difference of different time steps.

**Moving average:** connecting residual error and the observations. Below is the stock market price prediction for Nokia stock index. The below figure (Fig.3) gives the flow of data in the ARIMA model.

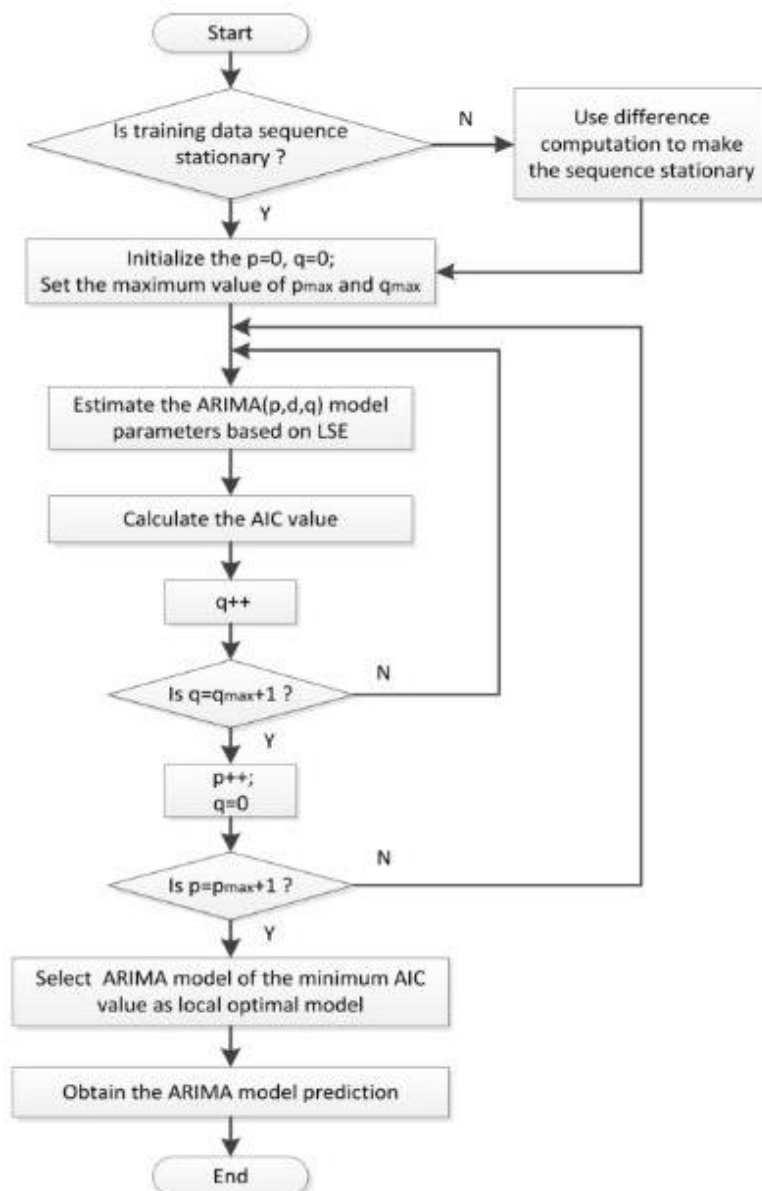


Fig.3 Arima Flow Chart

**Using LSTM:**

Long Short Time memory (LSTM) has criticism association. It forms the grouping of association. It comprises of a cell, an information entryway, a earn door and an overlook door. Clench hand layer has estimations of discretionary time interims. Also, the remainder of the three entryways streamline the move through the doors and all through the cell. These are appropriate on time arrangement information; this is intended to stay away from the long-haul reliance issue. Referring (Fig.4) Initially neural network takes the input and carry outs the pointwise operation on the time series data. It is then transformed to Vectors form and each vector is concatenated and copied and used for the forecasting.

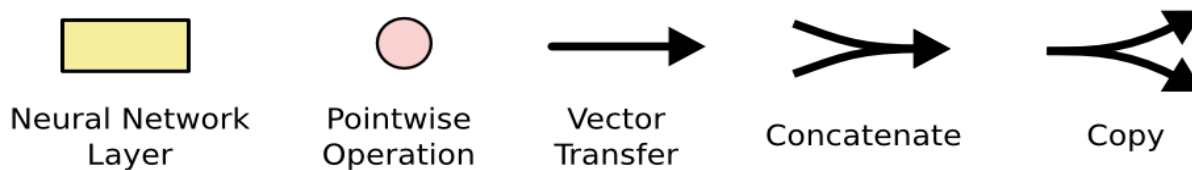


Fig.4 LSTM Architecture

## V. RESULT AND ANALYSIS

In this final phase, test the classification model on the prepared image dataset and also measure the achieve on the dataset. To assess the presentation of the made grouping and make it similar to current approaches, we use precision to quantify the viability of classifiers.

In this last stage, test the order model on the readied picture dataset and furthermore measure the presentation on dataset. To assess the presentation of the made characterization and make it similar to current approaches, use precision to quantify the viability of classifiers.

In any case, the most by and large used show estimations will be delineated, and after that some acclaimed estimation techniques are uncovered and appeared differently in relation to each other. "Execution Metrics for Predictive Modeling. In request issues, the basic wellspring of execution estimations is a serendipitous occasion arrange (portrayal system or a plausibility table)". (Fig.5) shows the forecasting result.

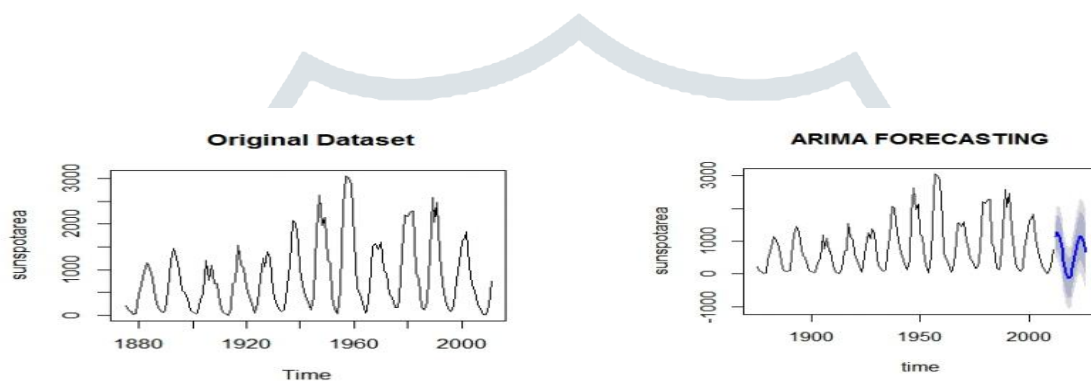


Fig.5 Forecast result

## VI. CONCLUSION:

We can use the principle of artificial neural networks to correctly predict the future value of a particular stock. This is done in steps, first we collect the past data of a stock. Then we create a neural network & train the network on the basis of the past data. Generally, 80-90% of the data is taken to train the model. Then we use our model to predict the value of the stock & compare the value with the pre obtained data set.

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