

# Stock Price Prediction Using ML

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***Abstract** - In Stock Market Prediction, the aim is to predict the future value of the financial stocks of a company. The recent trend in stock market prediction technologies is the use of machine learning which makes predictions based on the values of current stock market indices by training on their previous values. Machine learning itself employs different models to make prediction easier and authentic. The paper focuses on the use of Regression and LSTM based Machine learning to predict stock values. Factors considered are open, close, low, high and volume.*

***index terms** - Data set, Training model, Machine Learning, Regression model*

## I. INTRODUCTION

Stock market prediction and analysis are some of the most difficult jobs to complete. There are numerous causes for this, including market volatility and a variety of other dependent and independent variables that influence the value of a certain stock in the market. These variables make it extremely difficult for any stock market expert to anticipate the rise and fall of the market with great precision.

However, with the introduction of Machine Learning and its strong algorithms, the most recent market research and Stock Market Prediction advancements have begun to include such approaches in analyzing stock market data.

In summary, Machine Learning Algorithms are widely utilized by many organizations in Stock market prediction.

## II. LITERATURE REVIEW

The prediction of economic time series is quite a herculean task, which has fascinated the attentiveness of many scholars and is extremely vital for investors. This paper focuses on presenting a deep learning system, which makes use of a range of facts for a part of stocks to predict the value of the stock. This model has been trained on the smallest of data for a particular stock and accurately estimates the concluding value of that stock for multi-step ahead. It consists of an autoencoder in order to

remove noise and makes use of time series data engineering to syndicate the advanced features. These new features are given to a Stacked LSTM Autoencoder for multistep-ahead estimation of the stock concluding value. Further, this estimation is used by a profit maximization approach to offer assistance on the right time for buying and selling a particular stock. The results indicate that the suggested framework outclasses the state of the art time series forecasting methodologies with respect to analytical accuracy and effectiveness.

### **III. METHODOLOGY**

Stock market prediction seems like a complicated problem because there are various factors that are still left unaddressed and do not seem to be statistical at first. But to our rescue there are various machine learning algorithms by using which we could efficiently predict current trends in the stock market by using the references from the previous data. Here the dataset that we are going to use has been collected from Tiingo API. This dataset consists of stock data of all US stocks from 2017 and many other values that are relevant to each other. This data predicted the stock prices at some intervals of time for each day in a year. Many sections such as volume, date etc were

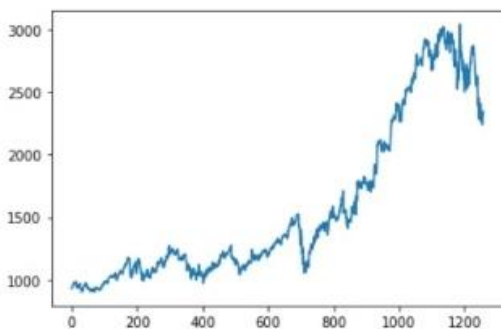
included in it. In order to simulate and analyze only one company's data was taken into account. The test set was placed as 30 percent of the dataset that was available. Although Machine learning has various algorithms that could be used for predicting the stock prices here in this paper we make use of two main algorithms known as RNN and LSTM.

#### **RNN AND LSTM**

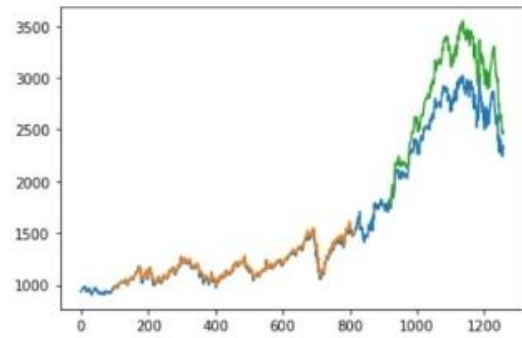
Recurrent Neural Network is a type of Neural Network in which the input to the next layer is taken from the output of the previous layer. It has many types to it and LSTM is one among them. LSTM stands for Long Short Term Memory. It basically has three parts to it which are input layer, forget layer, output layer. Input layer is responsible for deciding what amount of information should be carried forward to the next layer from the previous layer and the output layer is responsible for deciding what amount of data should be sent forward into the next layer as input. The reason for the immense popularity of the LSTM is its special power to memorize the data. In a basic neural network that consists of only one layer that is hidden the number of layers to be contained in the input layer mostly depends on the dimensionality of the data, and these input layer neurons get connected to the hidden layers via 'synapses'. The relationship

between each of the two nodes from the input layer to the hidden layer consists of a coefficient called weight which acts as a decision maker for the signals. The learning process of the model is basically nothing but a continuous fine-tuning of weights and gradually after the completion of the entire process, the artificial neural networks will have optimum weights for each synapse. An activation function such as a sigmoid or a tangent function is applied to the input layers in order to minimize the error rates and a softmax activation function is used in the output layer. The main functionality of this activation function is to produce non linearity in the model. After this a Back propagation algorithm will be applied in which the same process repeats itself again and again that is, the information keeps getting transferred back and forth until the weights are normalized and the error rate is minimalized. Finally the model will be trained on the training dataset and tested on the test data set.

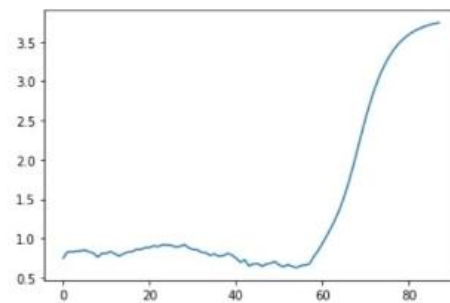
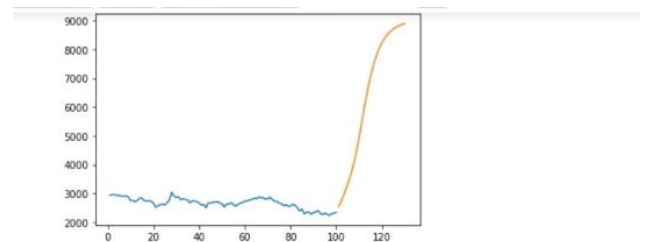
#### **IV. RESULT AND DISCUSSION**



This is the stock graph in real



This is stock graph comparison



This is the stock graph predicted

#### **V. CONCLUSION**

From the research done so far it could be concluded that the RNN and LSTM libraries are very effective in determining the stock price trends effectively relative to the actual market trend. At the same time what we could find out is that the python libraries that were used as a part of the training process were not very

optimal. As far as the training speed is considered the functions that we use from the mathematics principle have a lot faster speed comparatively and they consist of more detailed designs and significant improvements when tested under various situations. However, the python library functions are considered to be more adaptable. From our work done so far we can easily tell that certain stock trends can be predicted easily on the basis of certain general rules and regulations of the stock. This the main reason behind the existence of the private placement institutes. Few things such as optimization of the neural network parameters as well as the training process however always has much room for improvement. All these points would be considered as further steps in the research.

## **VI. REFERENCES**

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