Stock Market Prediction using Machine Learning

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Abstract

Stock market prediction or forecasting is a serious challenge for corporate brokers stakeholders and investors. Stock of each company fluctuates in a random manner and becomes hard and risky for investors to invest. In this project we apply knowledge of machine learning techniques to predict stock prices of a particular company. Which will help to gain confidence while making an investment decision.

Key Words - Machine Learning, Data set, Linear regression, Stock market, Prediction. Share Price, Business, Statistics

Introduction

A **stock market**, **equity market**, or **share market** is the aggregation of buyers and sellers of stocks (also called shares), which represent ownership claims on businesses. Major companies like Reliance, Jio , Tata consultancy services are IPO (Initial Public Offering) listed companies. For a company to share their partnership publicly they have to be IPO recognised and listed .A **stock is a** general term used to describe the ownership certificates of any company. Our goal in this project is to forecast oro predict the value of stock price of a particular IPO registered company. In this project we are going to predict the stock price of Tata Consultancy Services (TCS). In this project we are going to use machine learning to predict stock price. Stock price prediction is one of the most difficult tasks and by using machine learning algorithms to predict results in high accuracy and speed. In particular we are going to use a Linear regression model for the prediction of the stock value. Linear regression is a model that assumes a **linear** relationship between the input variables (x) and the single output variable (y). More specifically, that y can be calculated from a **linear** combination of the input variables (x). In our case the dataset we acquired for tcs stocks from

the year 2010 to 2021 suggests that linear regression can provide good accuracy in the prediction of stock price.

Literature Survey

[1]The author has used linear regression , Polynomial and RBF and compared its confidence values and it is found that Linear regression has more confidence value than the other two. Open , HIgh and low price are input independent variables and close price is target dependent variable.

[2] In this research paper the author used supervised learning concepts like classification and regression. They have used KNN and linear regression to forecast daily price of stock and they have found that KNN-Algorithm shows 63% of accuracy, and Linear regression shows 98% of accuracy.

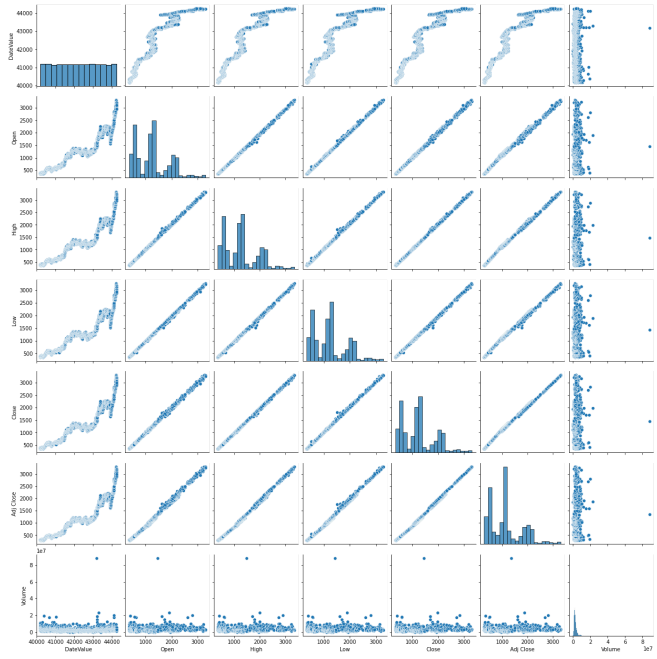
Implementation

We are using the following approach to predict the stock price.

- Gathering data
- Preparing that data
- Choosing a model
- Training
- Evaluation

We have explored many websites and apis to get the accurate data for our project. We then collected all data from Yahoo Finance and its API. We have collected data of a particular company named “Tata Consultancy Service (TCS)” from year 2010 to 2021. Here we have taken the data of NSE(National Stock Exchange). Our data set consists of the following columns “Date” , “Open” , “High” , “Low” , “Close” , “Adj. Close” and “Volume”.

The data set was filled with some errors and null values and some outliers which we concluded while performing the first EDA(Exploratory Data Analysis). We then performed normalisation on the data followed by redundancy check. After that we removed the null or NaN values from our dataset. The data set was processed and ready to use by the model.



The above image depicts that parameters are linearly related to one another.After processing the dataset we determined that linear regression model is most appropriate in this type of situation.

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As of now we have tried using different parameters for training of the model. Currently we are using scikit learn library for training the model. We have used “Open” , “High” , “Low” and “Volume” to get the outcome.

Results

After training data we have found out that most of the stocks have linear relation with other variables and coefficient of determination (R^2) found out near 0.7 - 0.9. It has been seen that linear regression model fails when there is exponential changing

Conclusion

Stock market prediction has a high demand for beneficial business across the globe. Prediction always helps to decrease the risk factor.

After this process it has led to the conclusion that it is possible to predict stock markets with more accuracy and efficiency using machine learning techniques.

We have used Linear Regression technique in this project, this technique has shown an improvement in the accuracy of predictions and therefore yielding positive results.As stock market has its own world, in the future stock market prediction system can be further improved by utilizing much bigger dataset than the one we have used currently. This would help to increase the accuracy of this prediction model.

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