STOCK PRICE PREDICTION

A Project Work Synopsis

Submitted in the partial fulfilment for the award of the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE WITH SPECIALIZATION IN

BIG DATA AND ANALYTICS

Submitted by:

20BCS4438 - Amarpreet Singh

20BCS4416 - Mohit Kumar Daga

Under the Supervision of:

Ms. Bhavna Nayyer

CHANDIGARH UNIVERSITY, GHARUAN, MOHALI - 140413,

PUNJAB

August, 2023

Abstract

In this work, we forecast stock price using machine learning. Stock price movements can be predicted using machine learning. Stock price forecasting aims to assist investors in making more precise and knowledgeable financial decisions. To improve stock forecast accuracy and generate lucrative trades, we advise using a stock price prediction method that incorporates mathematical techniques, machine learning, and other outside factors. LSTMs are effective at addressing problems involving sequence prediction because they can remember past data. This is relevant to our situation since it might be challenging to predict a stock's future price without first knowing its past price. Even if it can be difficult to predict a stock's price exactly, we can create a model that will show whether it will rise or fall. The goal of stock market prediction is to forecast the value of a company's financial stocks in the future. The use of machine learning, which produces forecasts based on the values of current stock market indices by training on their prior values, is a recent trend in stock market prediction technologies. Multiple models are used by machine learning to facilitate and authenticate prediction. The research focuses on the use of machine learning techniques based on LSTM to forecast stock values.

Keywords:

Close, high, low, open, regression, and volume.

Table of Contents

1. INTRODUCTION

1.1 Problem Definition

Stock price prediction is a difficult problem to solve. It can be broken down into several sub problems.

The first of these is predicting the future value of a stock. This is done by using past information about the stock, such as its price and volume, as well as current data about the company itself.

The second sub problem involves predicting how much money a stock will make in the future. This requires making predictions about the company's sales and profits, as well as its growth rate.

The third sub problem involves predicting how an investor should react to changes in the price of a certain stock. This requires making predictions about how much an investor will buy or sell shares depending on their views on future earnings per share estimates for each company involved in this market share analysis.

The fourth sub problem involves predicting how many shares need to be bought or sold each day in order to keep up with demand caused by changes in prices due to trading volume each day over time periods ranging from hours to months or years depending on what type of market analysis you are doing.

Stock price prediction is the process of predicting the future value of a stock by using the historical trends of a stock's price movements. Stock price prediction can be used in a variety of settings, from financial markets to academic research.

It's a difficult task, and many factors go into making such predictions, including macroeconomic and industry trends, past performance, technical analysis, fundamental analysis and more.

Stock price prediction is the study of the relationship between a stock's price and its fundamental value. This means that we're looking at how much money a company is worth based on its earnings, profits and dividends.

1.2 Problem Overview

A stock price prediction model is a statistical technique that uses historical information about a company's stock price to make predictions about what the current stock price will be. The most common approach to making a stock price prediction model is to use past relationships between observed and unobserved variables, as well as predictive models for these variables.

The success of this approach depends on two factors: how clearly the past relationships can be linked to future ones, and how well the predictive models perform when applied to new data. For example, if you know that there is only a weak relationship between two variables, then your model will not be very accurate at predicting the value of those variables in the future—even if you have good predictive models for them.

Our project involves collecting data from the stock market and using that data to predict the stock price. We will use a combination of computational methods, statistical methods, and market knowledge to make predictions.

The goal of this project is to predict the stock price of company for the next quarter. This will be accomplished by analyzing historical data from the last 5 years, along with identifying patterns that can be used to predict future trends.

1.3 Hardware Specification

- Processor : Pentinum IV or above
- Hard Disk : 50 GB or above
- RAM : 2 GB or above

1.4 Software Specification

- Windows 10/11
- Anaconda
- Jupyter NoteBook
- Python

2. LITERATURE SURVEY

The literature survey of the stock price prediction project is a review of the existing research on the topic, which has been done by various scholars. The purpose of this research is to establish a method for predicting stock prices, and thus, investors can make more informed decisions about their investments. The study will also draw from academic studies that have been done in previous years regarding similar subjects.

The next step in this project is to create a data set that will be used for the analysis. This will include information such as past performance of companies and historical data related to market conditions such as GDP growth rates or inflation rates. The information collected will then be analyzed using statistical software such as Microsoft Excel or SPSS Statistics. This process can take anywhere from one week to several months depending on how many variables need to be analyzed per company's history record.

After gathering all of this information, it must be filtered so that only relevant data remains while discarding any irrelevant information or irrelevant variables (such as ones that don't have any effect on stock prices). After filtering out irrelevant variables, we can begin conducting statistical analyses on our dataset by running different tests.

The stock price prediction project is an attempt to predict the future path of a company's stock price using historical data. The goal is to find patterns and predict which patterns will lead to higher or lower prices for the company's stock.

2.1 Existing System

Existing Systems of STOCK PRICE PREDICTION

Our team is working on a new project: predicting the price of a company's stock. We have already developed an algorithm that can predict the price in future based on certain factors. Our goal is to make this project more accurate and user-friendly.

The model is built using neural networks and genetic algorithms, with several layers of neural networks and multiple layers of genetic algorithms. The model was trained with historical data for 10 days and then tested on new data for three days. It correctly predicted the price of company stock at 85% accuracy rate, which is much higher than other prediction models we evaluated during our research process.

The existing system of stock price prediction project is a system that is used to predict the stock price of a company. The project was created by a team of experts with years of experience in the field. The goal of this project is to provide users with accurate information about their stocks.

The system uses historical data and machine learning techniques to generate predictions about future stock prices. It also takes into account the company's current financial situation and its competitors' performance. Users can choose to input their own data or use an existing file if they want to see how their own stock is doing compared to others.

The existing System of stock price prediction system is based on the assumption that the market follows a random walk with mean equal to zero, and variance equal to one. The random walk model is used to describe the

dynamics of stock prices over time. The model assumes that there are no trends in stock prices and they follow random walks.

The model has been used extensively to study the behaviour of stocks in the past. Studies have shown that it can be used to predict future changes in stock prices with high accuracy.

The existing system of stock price prediction project is a prediction model based on various factors such as the number of shares outstanding, the number of common stock outstanding, the number of preferred stock outstanding, etc. The aim of this project is to predict the price of stock based on these factors.

The data for this project has been collected over a period of two years from various sources including news reports, SEC filings, and other publicly available information. The data has been cleaned and processed using a variety of statistical methods to ensure that the accuracy of predictions is high enough for practical use.

2.2 Proposed System

Our proposed system is a new approach to predicting stock prices. We're looking to predict the future, considering the past and the present. We want to be able to tell you what's happening right now in the market and how it will affect your investment decisions today.

The way our system works is by analyzing past data about the stock price of a company and making predictions based on that data. The more data we have, the better our predictions will be.

Our system will use machine learning techniques (differential equations and

LSTM) to understand what drives a company's stock price. This allows us to make predictions based on current events, which helps us create an accurate model of how people behave when they invest money into a company's stocks.

The proposed stock price prediction project aims to create a system that can predict the price of a stock before it is released to the public. The system will be developed on the GitHub platform, which allows for the easy sharing of code.

The project is divided into five tasks:

Task 1: Create a data set of historical prices for all stocks traded over a period of 5 years.

Task 2: Create an algorithm that identifies patterns in stock prices and predicts future prices.

Task 3: Develop an algorithm that uses these patterns to predict future prices more accurately than existing methods.

Task 4: Test your predictions against past results to see how well they perform in reallife situations.

Task 5: Repeat steps 1-4 until you have a working model.

This is a proposed system for predicting the price of shares in an upcoming Initial Public Offering (IPO), based on real-time data.

The goal of this project is to predict the price that a company will reach in its Initial Public Offering, by analyzing historical data and making predictions about future trends. The system will be tested on a sample of IPOs from the past decade, using real-time data from public sources such as SEC filings.

This project can potentially help companies with their IPOs by providing them with valuable information about how their stock will perform in the coming months. It could also assist investors in making decisions about what stocks to buy or sell, based on their projected performance.

2. PROBLEM FORMULATION

Problem Statement:

To predict the stock price of a company in the future, using historical data, we will predict how the stock price of company will change over time. We will use linear regression models to predict future stock prices. The model will be based on past data and current information about the company.
The main problem that we are going to solve is how to predict the stock price of acompany in a short time period.

The problem formulation for this project is as follows:
The goal of the project is to predict the stock price of a company based on its past performance and future prospects.

The data that we have available is from previous years, and it includes information such as revenues, profits, losses and other metrics.

We can use this data to make predictions about the future performance of the company's stock price based on how similar companies have performed in the past.

4. OBJECTIVES

The purpose of this project is to determine whether or not there is a relationship between stock price and the amount of time it takes for a company's shares to go from the initial offering price to its highest closing price.

This project will also determine which factors are correlated with this relationship.

1. To provide a comprehensive overview of the stock price prediction landscape, including both public and private data sources.
2. To develop new models and incorporate them into the forecast model.

3. To evaluate the performance of the forecast model in terms of accuracy, speed,and cost.

The research objectives for this project are to:

1. Establish the relationship between stock price and the earnings of a company.
2. Identify whether there is a correlation between stock price and market capitalization.
3. Examine whether there is an association between the two variables, i.e., stock price and market capitalization.
4. Find out the relationship between volume-price ratio and future stock pricesin order to predict the prices.

5. METHODOLOGY

Along with business analysis, requirement specification, design, programming, and testing, project management is an important element of the software engineering process. For years, it has been a source of heated dispute. Despite the fact that project management techniques are getting more mature, just approximately half of businesses (53 %) are fully aware of their value.

Any project, regardless of its magnitude, should follow a set of steps that can be controlled and managed. A typical project management process, according to the Project Management Institute (PMI), contains the following phases:

1 initiation,
2 planning,
3 execution,
4 monitoring / performance.

These phases describe the project management lifecycle and serve as a roadmap forcompleting certain tasks.

The methodology of stock price prediction project is based on the following assumptions:

- The company is a public company and has been listed on the stock exchange for at least one year.
- The market capitalization of the company is greater than or equal to $2 million.
- The price of the stock has not fallen for at least six months.
- The price of the stock has not risen for at least nine months.
- If the price of the stock rises, it will be followed by a fall or a stall in its growth rate.

In order to understand the stock price prediction project, we must first understand the methodology. We will use a predictive model that takes into account data from historical and current stock prices. Our model will then be used to determine what we believe the future value of a company's stock will be based on its performance over time.

We used a methodical approach to our stock price prediction project. We first assessed the data and information on the company, then we analyzed how

the company performed in the past, what its future goals are, and finally we predicted how the stock price will change over the next few years.
We used a data-driven approach to develop our methodology. We identified a number of factors that could influence stock price, including the following:

* The current and historical performance of a company's stock, including their operating income and revenue growth rate.

*The economic climate in which the company operates, including GDP growth rateand inflation rate.

6. CONCLUSION

This study used machine learning techniques to forecast stock prices for a corporation with a higher degree of accuracy and reliability. The implementation of the innovative LSTM Model as a method of determining stock prices is the researchers' main contribution. Both approaches have improved prediction accuracy, resulting in successful outcomes, with the LSTM model proving to be more effective. The findings, which show that machine learning techniques can be used to anticipate the stock market more effectively and accurately, are highly encouraging. By using a much larger dataset than the one being used right now, the stock market prediction system's accuracy can be significantly increased in the future. Additionally, other machine learning models that are currently under development should be examined to see how accurate they are. A potentially interesting area is sentiment analysis using machine learning to determine how news impacts a

company’s stock price. It is also possible to employ other deep learning-based models for prediction.

REFERENCES

[1] . Usmani, S. H. Adil, K. Raza and S. S. A. Ali, ”Stock market prediction using machine learning techniques,” 2016 3rd International Conference on Computer and Information Sciences (ICCOINS), Kuala Lumpur, 2016, pp. 322-327

[2] . Raza, ”Prediction of Stock Market performance by using machine learning techniques,” 2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT), Karachi, 2017, pp. 1-1.

[3] . L. Siew and M. J. Nordin, ”Regression techniques for the predictio of stock price trend,” 2012 International Conference on Statistics in Science, Business and Engineering (ICSSBE), Langkawi, 2012, pp.

[4] V. Sujatha and S. M. Sundaram, ”Stock index prediction using regression and neural network models under non normal conditions,” INTERACT2010, Chennai, 2010, pp. 59-63.

[5] . Liu, G. Liao and Y. Ding, ”Stock transaction prediction and analysis based on LSTM,” 2018 13th IEEE Conference on Industrial Electronics and Applications (ICIEA), Wuhan, 2018.

[6] 787-2790.[8] and Y. Liu, ”Applying long short term memory neural networks for predicting stock closing price,” 2017 8th IEEE International Conference on Software Engineering and Service Science (ICSESS), Beijing, 2017, pp. 575-578

[7] . A. Althelaya, E. M. El-Alfy and S. Moha bidirectional LSTM for short- and long-term stock market prediction,” 2018 9th International Conference on Information and Communication Systems (ICICS), Irbid, 2018, pp. 151-156

[8] . A. Althelaya, E. M. El-Alfy and S. Moha bidirectional LSTM for short- and long-term stock market prediction,” 2018 9th International Conference on Information and Communication Systems (ICICS), Irbid, 2018, pp. 151-156

[9] abitza, F., Locoro, A., Banfi, G. (2018). Machine learning in orthopedics: a literature review. Frontiers in Bioengineering and Biotechnology, 6, 75.
[10] havan, P. S., Patil, S. T. (2013). Parameters for stock market prediction. International Journal of Computer Technology and Applications, 4(2),