Stock Market Analysis And Prediction

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Abstract - **A stock is a kind of investment that represents an ownership share in a company. The market is saturated with countless options of stocks and choosing the right ones for good business and financial opportunities requires a knowledge of the past trends and various other factors which makes it hard to analyze them using traditional data processing applications. With the advent of technologies like data science, extraction and analysis of these sets of data are made possible. These extracted datasets from the huge data pools of the stock market can be used to predict future trends by the use of machine learning, specifically recurring neural networks. As the stock data is in the form of a time series model the intent of this project is to use LSTM model for prediction and provide a web app service which extracts, analyses, predicts and visualizes stock information into a much generally accessible lingo.**

INTRODUCTION

Financial exchange is where trading of stocks/shares takes place. At the point when a financial backer purchases supplies of a specific organization he turns into a section proprietor of that organization as per the quantity of offers held by him. To create most extreme gain, right speculation ought to be made with impeccable timing. The principal capacity of a financial exchange is the dealings of stocks between financial backers. Stocks are assembled into industry bunches as per their essential business center. An exchange is the desire of a financial backer to sell a few stocks and the solicitation of one more to get them. Each stock isn't just portrayed by its cost yet in addition by numerous others factors.

Stock market analysis is a technique used by investors and traders to make purchasing and selling choices by studying and evaluating data from the past and present. It enables investors to comprehend the security that a stock may supply prior to investing in it. There are stock analysts that conduct extensive study to uncover any movement in any area of the stock market. Investors and traders can make purchasing and selling choices more quickly by employing stock market analysis.

There are two types of analysis, one is called fundamental analysis and the other one is called technical analysis. As a good investor or a trader one should look into both the segments. Fundamental analysis is a type of analysis where an investor needs to look into the past history of the company, company assets, economic report and financial data. In technical analysis one investor should be skilled enough to read all the financial statements of the company. There are few ratios which need to be determined and taken into consideration before investing. Ratios like price to earnings ratio

LITERATURE SURVEY

Prediction and modeling of the financial indices is a very challenging and demanding problem because it's dynamic, noisy and multivariate nature. Modern approaches have also to challenge the fact that they are dependencies between various factors like the global climate etc. All this complexity in combination with the large volume of historic financial data raised the need for advanced machine learning solutions to the problem. This article proposes a Deep Learning method utilizing Long Short-Term Memory (LSTM) for the modeling and trading of stocks. Hybrid Deep Learning Models for Stock Prediction, Mohammad Asiful Hossain, Rezaul Karim, Ruppa Thulasiram, Neil D B. Bruce, Yang Wang. Stock market prediction has always caught the attention of many analysts and researchers. Predicting stock prices is a challenging problem in itself because of the number of variables which are involved. This paper reviews all these points. Stock index forecasting based on a hybrid model, J.J. Wang, J. Z. Wang, Z. G. Zhang, and S. P Guo.

Accurate stock price forecasting is very important for investors in deciding investment strategy. Data mining techniques have been applied to stock market prediction in recent literature.

Time series methods have been used to forecast various types of data. However, the application of conventional time series models requires to meet the statistical assumptions, and not all models can be applied to all datasets. Most of the traditional time series models use a single variable for prediction, but there are many noises involved in raw data.

Anticipating stock costs is a significant assignment of monetary time series estimating, which is of extraordinary premium to stock financial backers, stock dealers and applied specialists. Many AI procedures have been utilized lately to foresee the stock cost, including relapse calculations which can be helpful instruments to give great exactness of monetary time series forecasting. In this paper, we are proposing to use a recurrent neural network model LSTM for efficient and accurate prediction of stock which will visualize the data in the form of graphs and a user friendly GUI.

OBJECTIVE

- Extract and analyze stock data from the stock market.
- Visually display the day to day metrics of the market like the average daily return of the stocks and the overtime change of the stock price.
- Predict future trends based on past data.
- Display all the data on an easily accessible online platform for the user with an efficient interface and to help with the process risk analysis and investment.

METHODOLOGY

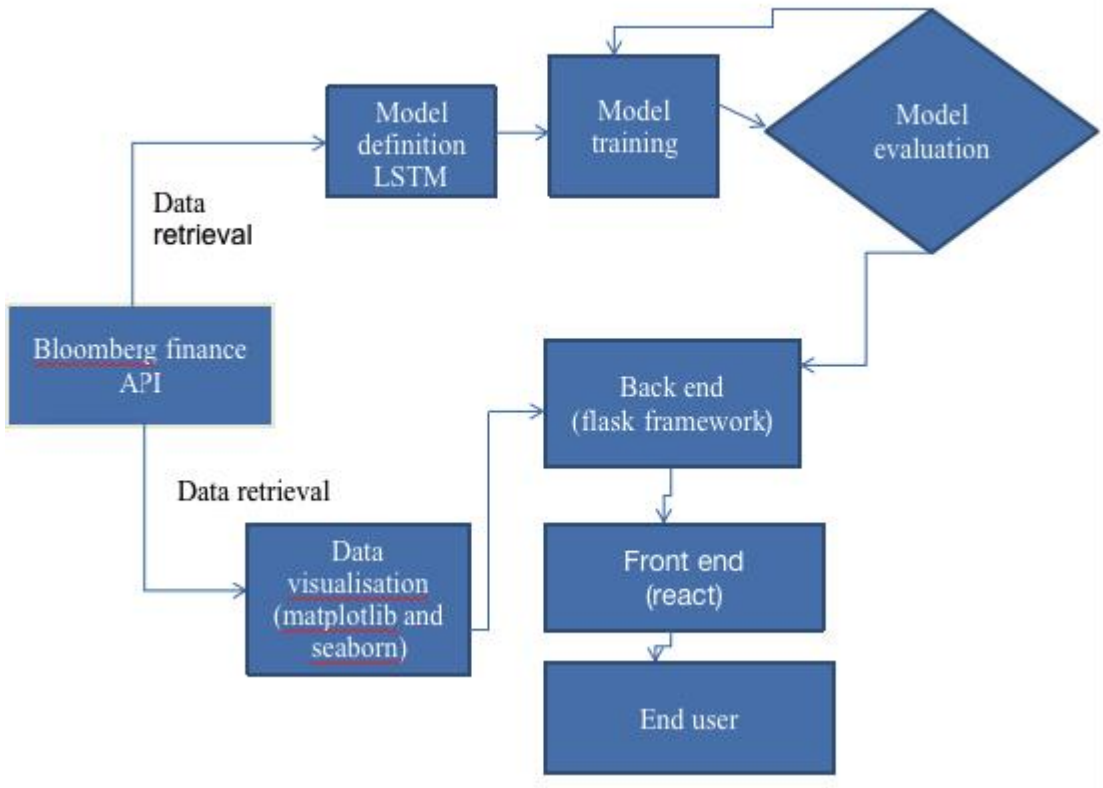
- Machine learning:
  - Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy without explicit programming.

- Neural network:
  - A neural network is a series of algorithms that attempts to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. In this sense, neural networks refer to systems of neurons, either organic or artificial in nature.

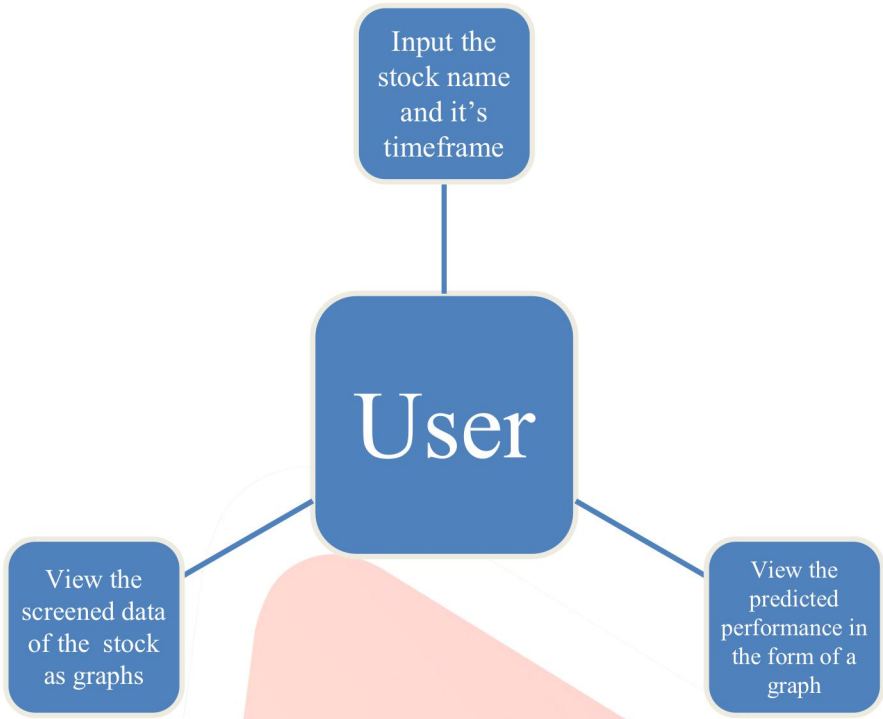
- Working of a neural network:
  - A neural network has many layers. Each layer performs a specific function, and the more complex the network is, the more the layers are.

    A neural network has three layers:
    - The input layer: The input layer picks up the input signals and transfers them to the next layer. It gathers data from the outside world.
    - The hidden layer: The hidden layer performs all the back-end tasks of calculation. A neural network has at least one hidden layer. The hidden layer performs all the back- end tasks of calculation. a neural network has at least one hidden layer.
    - The output layer: The output layer transmits the final result of the hidden layer's calculation.

DATA FLOW DIAGRAM



USE CASE DIAGRAM



HARDWARE REQUIREMENTS For training:

- Laptop: intel processor with at least 8GB RAM and 100GB Free storage.
- GPU: For faster training of data locally for initial weights.

SOFTWARE REQUIREMENTS

- Pandas and numpy for data analysis.
- Matplotlib for visualization of the analyzed data.
- Language: Python.
- Bloomberg finance API.
- Flask framework for deployment.
- React for web development.

CONCLUSION

Two techniques have been utilized in this paper: LSTM on the Bloomberg finance dataset. The technique has shown an improvement in the accuracy of predictions, thereby yielding positive results. Use of deep learning techniques in the prediction of stocks has given promising results and therefore marke the use of them in profitable exchange plans. It has led to the conclusion that it is possible to predict stock market with more accuracy using deep 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 in the process of increasing the accuracy of our LSTM model.

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