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Visualization and Forecasting of Stocks Using Python and ML

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Abstract: Stock trading is one of the most important activities in the world of finance. Market forecasting is the act of trying to determine the future price of other financial instruments traded on the financial exchange. This document explains the forecasting of the market using machine learning. Most stockbrokers use technical and fundamental or time series analysis when making stock forecasts. The programming language used to predict stock markets using machine learning is Python. In this paper, we propose a machine learning (ML) approach that will learn from the data available at yfinance, and derive the intelligence and then use the information gained to make accurate predictions. In this case, this study uses a machine learning technique called LSTM to predict the closing price of stocks of five different stocks using the daily and price last minute frequency.

Keywords: Stock Market, Machine Learning, Predictions, LSTM

I. INTRODUCTION

Basically, many traders with a lot of money on the exchange buy stocks and shares at cheap prices and then sell them at high prices. The difference between the stock market forecast is nothing new, but the issue has been discussed by many organizations. Stock analysis, where investors look at the value of products before investors invest in stocks, and business, trade, business mood, etc. decides whether to invest or not. The Analysis is the transformation of market production statistics of the product, such as historical prices and volumes, through market studies. The advancement of machine learning in many industries in recent years has encouraged many traders to use machine learning in this field, and some have achieved very good results. This article will create a financial forecast program that will include all historical cost data and the data will be treated as training for the program. The main purpose of forecasting is to reduce uncertainty about investment decisions. The market is trending, which means that with tomorrow's price, your best guess is today's price. Needless to say, the stock index is very difficult to predict because requires an accurate forecasting model of market fluctuations. The stock market has changed a lot and is affecting the beliefs of traders. Due to the importance of financial world, known parameters (before closing date, P/E, etc.) and unknown (election results, rumors, etc.). There are many attempts to use machine learning to predict stock prices.

II. LITERATURE REVIEW

From the literature survey, it is clear that the machine learning techniques is applied for stock market vaticination across the world. Compared to contemporary vaticination techniques, these techniques are much more accurate

The research work done by Lufuno Ronald Marwala A dissertation submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of Science in Engineering. The weak form of Efficient Market hypothesis (EMH) states that it is impossible to forecast the future price of an asset based on the information contained in the historical prices of an asset. This means that the market behaves as a random walk and as a result makes forecasting impossible

The research work done by Dharmaraja Selvamuthu, Vineet Kumar and Abhishek Mishra Department of Mathematics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi 110016, India. A stock market is a platform for trading of a company's stocks and derivatives at an agreed price. Supply and demand of shares drive the stock market. In any country stock market is one of the most emerging sectors. Nowadays, many people are indirectly or directly related to this sector. Therefore, it becomes essential to know about market trends. Thus, with the development of the stock market, people are interested in forecasting stock price. But, due to dynamic nature and liable to quick changes in stock price, prediction of the stock price becomes a challenging task.

The research work done by Manh Ha Duong Boriss Siliverstovs. Investigating the relation between equity prices and aggregate investment in major European countries including France, Germany, Italy, the Netherlands and the United Kingdom.

Increasing integration of European financial markets is likely to result in even stronger correlation between equity prices in different European countries. This process can also lead to convergence in economic development across European countries if developments in stock markets influence real economic components, such as investment and consumption. Indeed, our vector autoregressive models suggest that the positive correlation between changes equity prices and investment is, in general, significant. Hence, 6 monetary authorities should monitor reactions of share prices to monetary policy and their effects on the business cycle.

The research work done by Hyeong Kyu Choi, B.A Student Dept. of Business Administration Korea University Seoul, Korea. Predicting the price correlation of two assets for future time periods is important in portfolio optimization. We apply LSTM recurrent neural networks (RNN) in predicting the stock price correlation coefficient of two individual stocks. RNN's are competent in understanding temporal dependencies. The use of LSTM cells further enhances its long-term predictive properties.

III. METHODOLOGY

The following steps to be taken while defining the methodology of project visualization and forecasting of stocks using python an ML:

- 1) Aggregation: The first step is to identify the hypotheses that the investors obtained. This will include research, interviews and focus group discussions to understand their needs and expectations.
- 2) Analysis and design: Analyzes the system and determines its structure when necessary. This will include the creation of detailed documentation detailing the design, user interface and system flow.
- 3) Development: The system will be developed using the appropriate language and development platform such as streamlit. The development process will include designing the user interface and implementing the required functionality.
- 4) Test: The functionality, usability and functionality of the system will be tested. This will include unit testing, combination testing and physical testing to meet specific needs.
- 5) Delivery: After the system is tested and available, it is sent to the production site. This includes installing the software components, setting up the system, and doing all the necessary work.
- 6) Maintenance: After the system is commissioned, it will be regularly maintained to ensure it continues to function properly. This includes bug fixes, security patches and software updates to keep the system up to date and secure.

We propose an online web-based application that uses a learning model to estimate the value of items supplied. The challenge of this project is to predict the future open price of a particular stock at a particular time in the future. For this project, we will use a Long Term Memory network, commonly known as LSTM, to predict the closing price of the stock using information about past prices. We use keras fed into the LSTM model to estimate the supply price using historical quoted prices and trading volume and find the estimated price, significance over time, and best of model. The model predicts 30 data points as input data and outputs the last data points. The model is installed as the backend of the website with the data integration function. Additional methods are roughly divided into two groups: statistical methods and artificial intelligence. The methods include logistic regression models and multilayer perceptrons, convolutional neural networks, single-layer LSTMs, support vector machines, recurrent neural networks, etc. They include artificial intelligence methods that contain and use short-term (LSTM).

IV. ARCHITECTURE

The system architecture of our project is mainly divided in some parts like data training data testing, splitting data into MinMaxScaler for feeding into LSTM model.

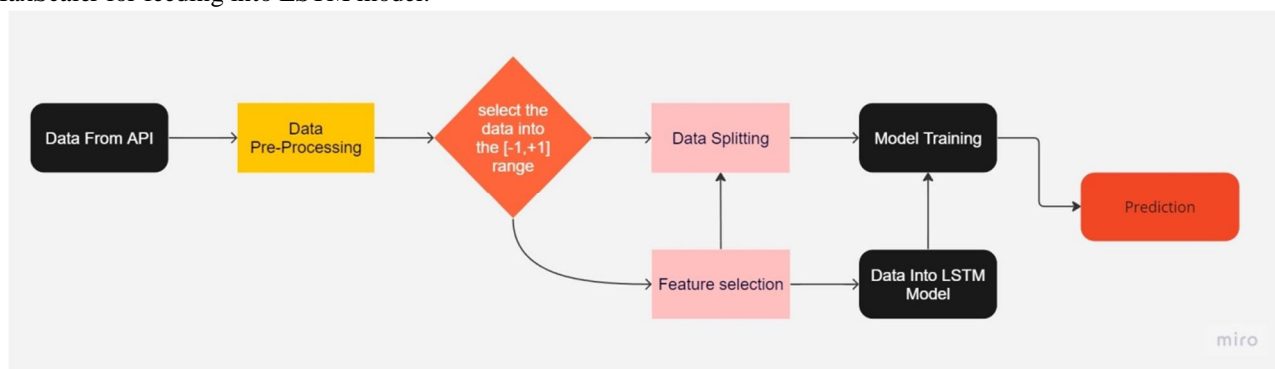
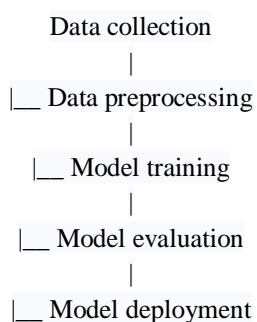


Fig1. Architecture of project

- 1) Problem statement: it is the initial stage where we find out the most problems faced by stock investors and especially new peoples who want to invest their money in stock market. After finding out the most probable problems we start gathering much possible solutions on that.
- 2) Requirement gathering: after finding the problems we start our most first step of project that is requirement gathering. Where we research a lot about this problem. Read the most related research papers. And start taking important topics to be implemented in our project
- 3) Finalize the model: there are many machine learning and deep learning models which may be used for prediction but every model has a their own disadvantages while working with time series data. our finalize model i.e. LSTM is the only model which can work better and efficiently with the time series data, that's why we choose it as our final model
- 4) Data collecting: for the forecasting purpose we collect the data from Yfinance of particular 5 stocks they are: "Adanient.Ns", "Tatasteel.Ns", "Pageind.Ns", "Eichermot.Ns", "Infy.Ns"
- 5) Data pre-processing: after collecting the data we work on to cleaning the data and fit it into MinMaxScaler for reliable data feeding.
- 6) Model training: The next step is to train a model on the pre-processed data. We use LSTM model which is a type of recurrent neural network that is well-suited for time series forecasting.
- 7) Web app building: after completing the Jupyter notebook for forecasting we use Streamlit framework of python to make web app.



The variety of tools in python allows us for data collection and data preprocessing. And it is important to note that the stock forecasting is challenging task. Many factors can affect the price of stock, and it is difficult to predict how that factor changing the future of stocks.

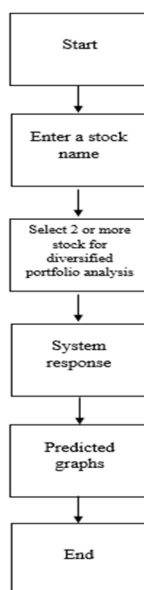


Fig.3 Flow chart

As we know LSTMs are able to process sequences of data by using a technique called "backpropagation through time" this technique allows the LSTM to learn the relationships between the different data points in the sequence. The main aim using LSTM is for better prediction. And for that we need more values loss from the sequential data that's why we used sequential method

```

Model: "sequential"
=====
Layer (type)                Output Shape          Param #
-----
lstm (LSTM)                  (None, 15, 32)       4352
lstm_1 (LSTM)                (None, 15, 32)       8320
lstm_2 (LSTM)                (None, 32)           8320
dense (Dense)                (None, 1)            33
=====
Total params: 21,025
Trainable params: 21,025
Non-trainable params: 0
  
```

Fig4. Sequential model training

Compare last 15 days vs next 10 days

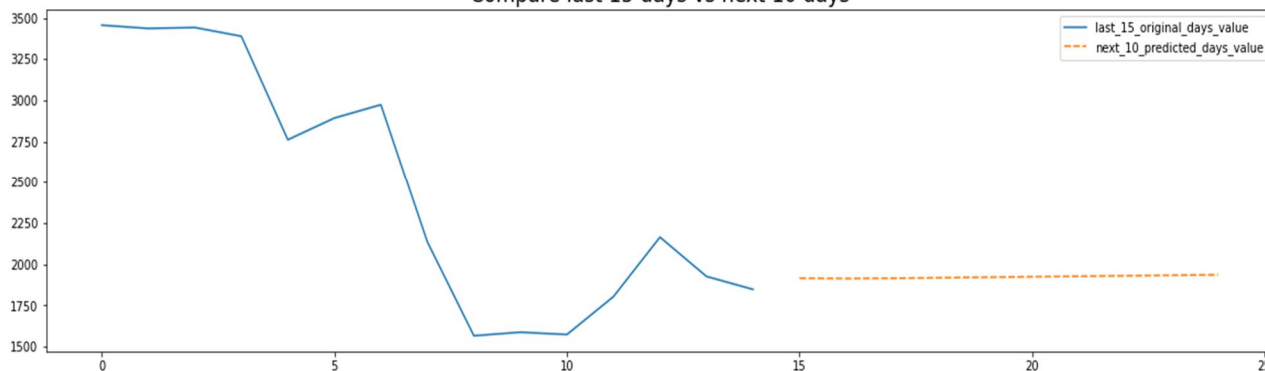


Fig5. Original vs predicted price comparison

Plotting whole closing stock price with prediction

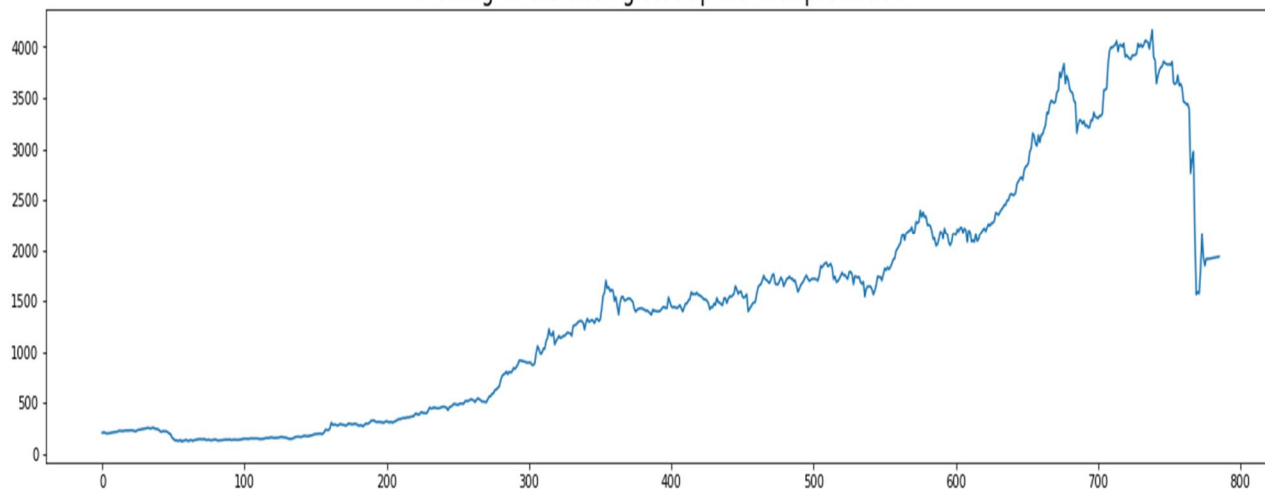
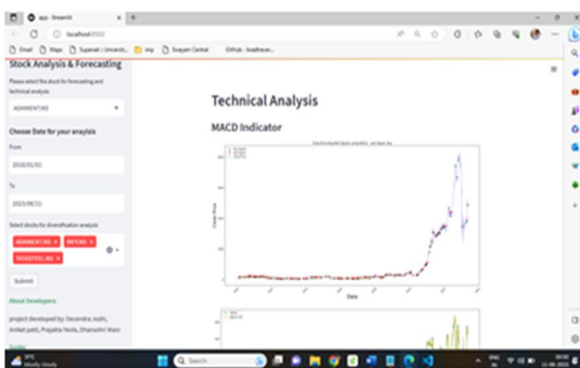
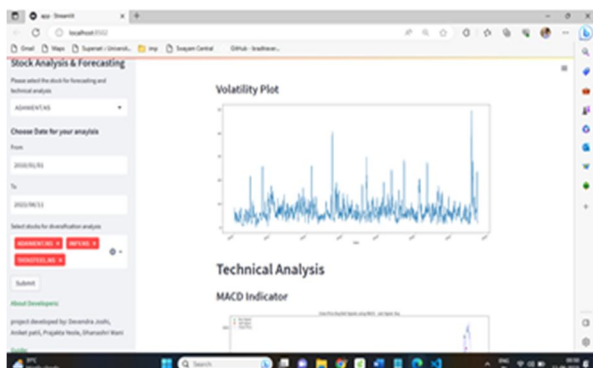
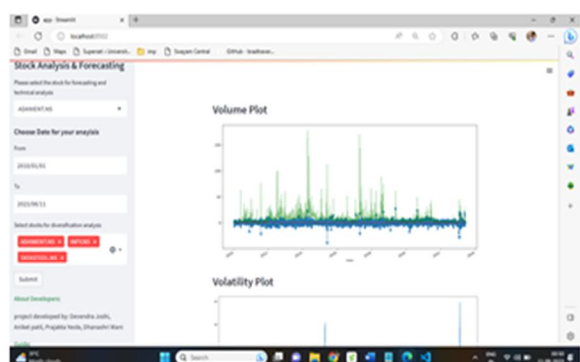
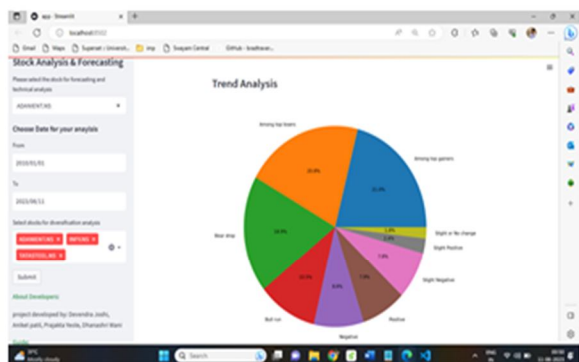
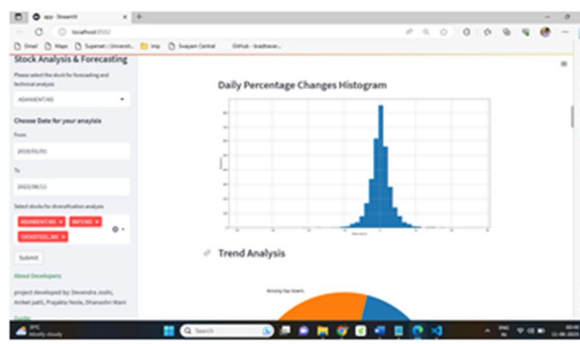
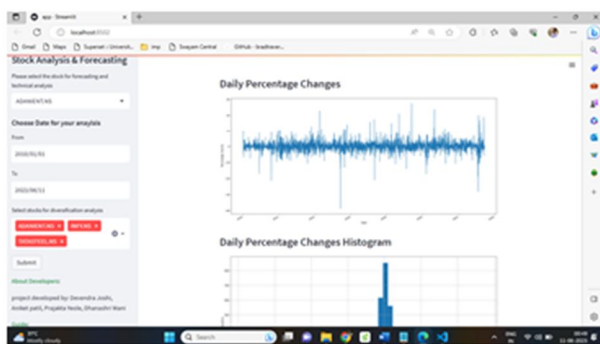
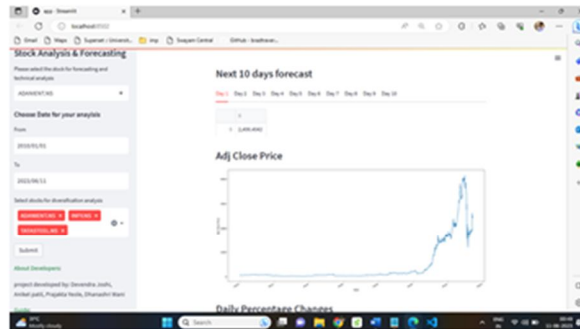
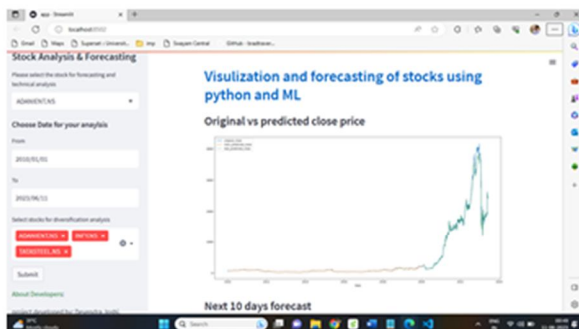


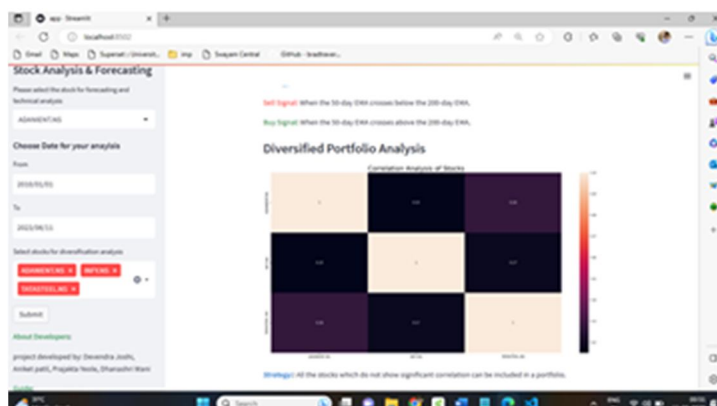
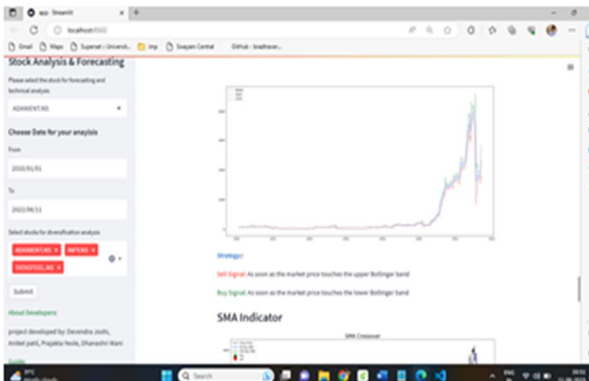
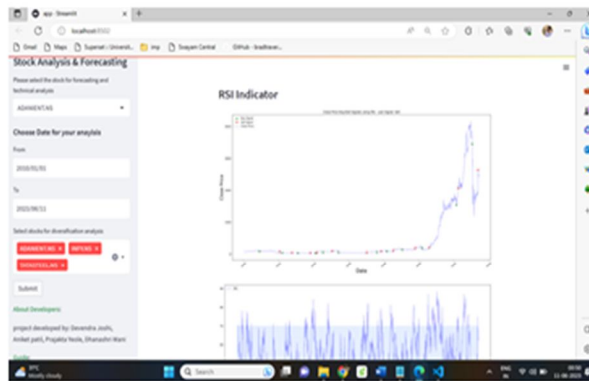
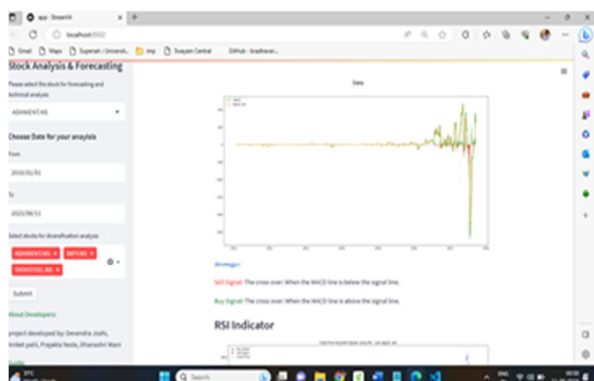
Fig6. Plotting final graph

V. RESULT AND DISCUSSION

Once the final app is ready, we run it for multiple times and after doing some testing operations we got the final result

For the new users we add more tools that will help them to understand the stock market and there is also some of strategies for buying and selling of stocks.





VI. CONCLUSION

Predicting the future has become the dream of most businesses and people because of the benefits of predicting the future. The stock price forecast will also be useful for those who want to learn about the business forecast. We studied 2 models, the Linear Regression model and the LSTM model, in which the LSTM model has better estimation compared to the Linear Regression model.

We predict the closing price of the selected products, we have developed an application that uses the LSTM algorithm to predict the closing price. We use Yahoo Finance data for certain companies such as "adaniemf.ns", "tatasteel.ns", "pageind.ns", "eicheremf.ns", "infy.ns" and get very good accuracy for this product. In the future, we can expand this application to predict the cryptocurrency market and also add theories for better predictions.

We cannot assume that it is a completely correct model because during the run of this project we learned that economic forecasting is impossible due to many errors. So this is just an educational level model for understanding the concepts of time series forecasting and working with a real-time model.

REFERENCES

- [1] Lufuno Ronald Marwala A dissertation submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg, in fulfilment of the requirements for the degree of Master of Science in Engineering – "Forecasting the Stock Market Index Using Artificial Intelligence Techniques".
- [2] "Indian stock market prediction using artificial neural networks on tick data" Research paper of Dharmaraja Selvamutu, Vineet kumar and Abhishek Mishra Department of mathematics, Indian institute of technology Delhi, Hauz khas, New delhi 110016
- [3] Research paper on the "stock market and investment" by Manh Ha Duong Boriss siliverstoves which shows the relation between equity prices and aggregate investment
- [4] "Automated stock price prediction using machine learning" by mariam Moukalled wassim El-Hajj Mohamad jaber computer science department, American university of Beirut
- [5] "stock price correlation coefficient prediction with ARIMA_LSTM Hybrid model" by, Hyeong kyu choi, B.A student department of business administration Korea university seoul, Korea
- [6] "Event representation learning Enhanced with external common-sense knowledge" by Xiao ding, kuo liao, Ting Liu, Zhongyang Li, Junwen Duan reserch center for social computing and information retrieval Harbin institute of technology, China.
- [7] "Forecasting directional movements of stock prices for intraday trading using LSTM and random forests" by pushpendu Ghosh, Airel Neufeld, Jajati keshri school department of computer science and information systems, BITS pilani k. k. Birla Goa campus, India. Division of Mathematical Sciences, Nanyang Technological University, Singapore Department of Mathematics, BITS Pilani K.K.Birla Goa campus, India
- [8] "A Deep Reinforcement Learning Library for Automated stock trading in quantitative finance" by Xiao-Yang Liu Hongyang Yang, Qian Chen, Runjia Zhang Liuqing Yang Bowen Xiao Christina Dan Wang Electrical Engineering, Department of Statistics, Computer Science, Columbia University, 3A14Finance LLC., USA, Ion Media Networks
- [9] "An innovative neural network approach for stock market prediction" by Xiongwen pang, yangiang Zhou, Pan wang, Weiwei Lin.
- [10] "An intelligent technques for stock market prediction" by M. Mekavel anik, M.Shamsul Arefin (B) Department of computer science and engineering Chittagong university of engineering and technology, Chittagong Bangladesh.
- [11] Stock Price Prediction Using LSTM on Indian Share Market by Achyut Ghosh, Soumik Bose¹, Giridhar Maji, Narayan C. Debnath, Soumya Sen
- [12] S. Selvin, R. Vinayakumar, E. A. Gopalkrishnan, V. K. Menon and K. P. Soman, "Stock price prediction using LSTM, RNN and CNN-sliding window model," in International Conference on Advances in Computing, Communications and Informatics, 2017
- [13] Murtaza Roondiwala, Harshal Patel, Shraddha Varma, "Predicting Stock Prices Using LSTM" in Undergraduate Engineering Students, Department of Information Technology, Mumbai University, 2015.
- [14] Ishita Parmar, Navanshu Agarwal, Sheirsh Saxena, Ridam Arora, Shikhin Gupta, Himanshu Dhiman, Lokesh Chouhan Department of Computer Science and Engineering National Institute of Technology, Hamirpur – 177005, INDIA - Stock Market Prediction Using Machine Learning.
- [15] Pranav Bhat Electronics and Telecommunication Department, Maharashtra Institute of Technology, Pune. Savitribai Phule Pune University - A Machine Learning Model for Stock Market Prediction.
- [16] Anurag Sinha Department of computer science, Student, Amity University Jharkhand Ranchi, Jharkhand (India), 834001 - Stock Market Prediction Using Machine Learning.
- [17] Asset Durmagambetov currently works at the mathematics, CNTFI. Asset does research in Theory of Computation and Computing in Mathematics, Natural Science, Engineering and Medicine. Their current project is 'The Riemann Hypothesis-Millennium Prize Problems' - stock market predictions.
- [18] Huicheng Liu Department of Electrical and Computer Engineering Queen's University, Canada - Leveraging Financial News for Stock Trend Prediction with Attention-Based Recurrent Neural Network.
- [19] M. Nabipour Faculty of Mechanical Engineering, Tarbiat Modares University, 14115-143 Tehran, Iran; Mojtaba.nabipour@modares.ac.ir - Deep Learning for Stock Market prediction



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