

# Visualization and Forecasting Stocks using Python

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**Abstract**—It is very difficult to predict stock prices because there are no clear forecast rules in the stock market, but it gives the highest returns in the market. Although volatile in nature, stock prices and other statistical factors can be visualized to help interested investors make prudent decisions about which companies to spend their profits on. Developing this simple project idea in Python allows you to create dynamic graphs of financial data for a given company using tabular data provided by the Python library *yfinance*. In addition, future stock prices can be predicted using the LSTM machine learning algorithm. This project is a great introduction for Python/data science newbies and a good refresher for experts who have already worked with Python/ML.

**Keywords:** Stock Market, Machine Learning, Python, *yfinance*, Prediction, Django, LSTM, Sklearn, Graphs.

## I. INTRODUCTION

Stock market Trading is the most sought after and so its popularity is increasing and researchers ought to find new techniques for prediction. Stock forecasting and visualizing techniques help investors and individuals to handle the stock market. For predicting the stock prices correctly the forecasting model should have great precision. In this project we used deep learning models and LSTMs and RNN units for predicting the stock prices accurately that assists the investors or individuals with correct knowledge about the situation of the stock market. The scope of visualizing and forecasting stock is very huge in the field of stock market. According to a recent report, the number of investors investing in the stock market is increasing every year, therefore a system of visualizing and forecasting stocks is required to guide the investors to invest carefully in the stocks. Stock price visualization is a dangerous trend that can lead to inaccurate value predictions as it depends largely on many factors. This project can be extended and modified in the future by training the model with more features with the help of subject matter experts and also including some important non-numerical features.

## II. LITERATURE REVIEW

This article is an investigation into the use of neural networks in stock price prediction. Neural networks provide

the ability to discover patterns in nonlinear and chaotic systems. Ability to predict market direction more accurately than current technology. Common market analysis techniques such as technical analysis, fundamental analysis,

And regression are discussed and compared to the performance of neural networks. In addition, the efficient market hypothesis (EMH) is presented and compared with chaos theory and neural networks. Finally, we discuss future directions for the application of neural networks in financial markets [1].

The utilization of a web page and its features is key to this endeavour. It is made to make it easier to get knowledge from several fields, including politics, information sciences, travel, and the information sciences. Platforms like Django and Bootstrap are readily available, which has simplified and shortened the process. In order to evoke a wave of curiosity among its users.

This online application is designed to have a broad scope, international applications, and parts and features in multiple languages. There will also be a section with current promotional codes and deals from different websites. As the modern period has progressed, blogs are now expected to provide a highly descriptive and insightful account of a certain event or topic [7].

To predict stock prices, this paper proposes a hybrid modelling strategy that builds multiple models based on machine learning and deep learning. The study used his NIFTY 50 index scores from the National Stock Exchange of India (NSE) from 29 December 2014 to 31 July 2020. We built eight regression models using training data from Dec 29, 2014 to Dec 28, 2018. We then use long-term and short-term memory (LSTM) networks and a state-of-the-art technique called walk-forward validation to build four deep learning-based regression models to increase the predictive power of our prediction framework. This result clearly shows that his LSTM-based univariate model, which uses

one week of historical data as input for predicting his NIFTY opening price for the next week, is ineffective [8].

Recurrent Neural Network (RNN) model, also known as the Long Short Term Memory (LSTM) model, and Bi-Directional Long Short Term Memory (BI-LSTM) model, are two well-known models that are used in this research to suggest a novel framework for stock price prediction. The simulation results demonstrate that our suggested strategy can estimate future stock trend with excellent accuracy utilizing these RNN models with appropriate hyper-parameter tuning. By adjusting the number of epochs, dense layers, hidden layers, and hidden layer units, the RMSE for the LSTM and BI-LSTM models was calculated. A freely available dataset for stock markets with open, high, low, and closing prices is used to conduct the assessments.[4]

The Tensor flow artificial intelligence engine is used in this study to classify and predict students' exam results. In addition to typical academic achievement operation efficiency subjects like mathematics, Chinese, English, physics, chemistry, biology, and history, the deep learning model also examined non-academic like service, conduct, sport, and the arts. Adjusted and compared parameters included the number of deep learning layers and intermediate nodes. The accuracy varied from 80% to 91% with a data set of 2,000 students, of which 75% were used as training data and 25% as testing data. The Tensor flow deep learning model's ideal setup for maximizing prediction accuracy is identified.[9]

### III. METHODOLOGY

**HTML:** The foundational web page for the web application was made using HTML. This HTML is made up of various components. HTML elements name different types of material. HTML elements instruct the browser how to display the content.

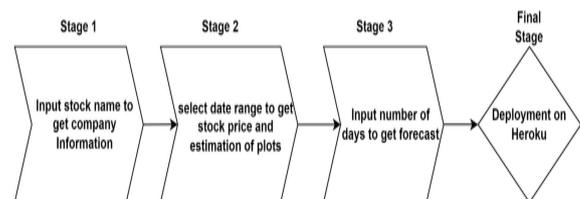
**CSS:** CSS is a programming language which is used to make a page written in HTML or XML accessible to the user. CSS determines how objects will be displayed in various ways. CSS (Cascading Style Sheets) is used to modify the font, colour, size, and placement of your content, divide it into several columns, or add motion, transitions, animations, opacity, shadows and other decorative features to web pages.

**Python:** Python is a popular and beginner friendly programming language for software and website development, Artificial intelligence, machine learning, process automation, and data analysis. Because Python is a general-purpose programming language, it can be used to write a wide range of programs without being limited to any particular problem. Its versatility and beginner-friendliness make it top of the list of programming languages in use today.

**Machine Learning (LSTM):** Machine learning is a method of data analysis that automates the development of analytical models. This branch of artificial intelligence is based on the idea that robots can learn from data, recognize patterns, and make judgments with little help from humans. Machine learning algorithms construct a model using training data, which are samples of data, without being expressly educated to do so. It is a subfield of artificial intelligence that focuses with building statistical and mathematical frameworks that enable computers to improve over time. Deep learning and artificial intelligence make use of a Long Short-Term Memory (LSTM) artificial neural network unlike traditional feedforward neural networks, LSTM contains feedback connections. A recurrent neural network, also called an RNN, can analyse single data points, like photos, as well as full data sequences, like audio or video. Each LSTM cell has three inputs, two outputs, and two internal inputs. is the hidden state, is the memory or state of the cell, is the present data point, or is the value entered at time t. The position of the preceding cell's concealed state and are the first non-linear activate layer's two inputs. The forget gate's output decides how much data from the cell before it will be covered, which is why it is called that.

**Django:** Django, a Python web framework, encourages rapid development and simplified, practical design. This open-source Python web framework uses the model-view-controller (MVC) architectural design paradigm. A full-stack Python web framework called Django makes it simple and quick to create applications that are secure and straightforward to maintain. It adheres to the DRY (Don't Repeat Yourself) concept and focuses on automation. Some of the most popular websites in the world, such as Instagram, Mozilla, and Space agency, use Django. It is created by seasoned developers who handle a lot of the complexity associated with web development, allowing developers to concentrate on building their apps without having to invent the wheel.

**yFinance:** The Python module yFinance offers a quick and easy way to retrieve past market data from Yahoo! finance. With the help of this well-liked open-source library, users can obtain financial data from Yahoo Finance. The Pandas library is the foundation of yFinance, which offers a simple user interface for downloading historical market data.



**Tensor Flow:** Tensor Flow, an open-source software tool, is used for dataflow and differentiable programming on a number of applications. It is a symbolic math library that is

also used in machine learning using neural network applications. Many Google products, including Google Photos and Google Search, make use of it. It was created by the Google Brain team. This was used to train the machine learning model which was used to predict the price of the stocks.

**Sklearn:** Scikit-learn (sklearn) is a free machine learning package for the Python programming language. It includes regression, classification, and clustering techniques such as the use of support vector machines, random forest models, gradient boosting, k-means, and DBSCAN. It also includes modules for selecting and assessing models, as well as several other utilities.

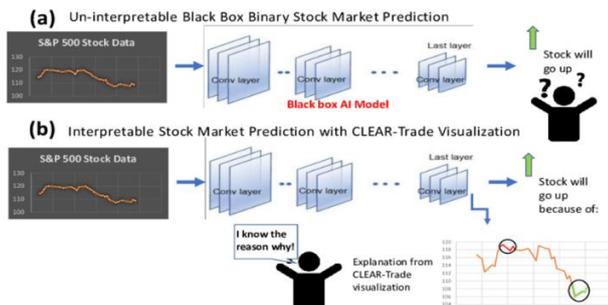
**Chartsjs:** There are many different types of charts supported by the free and open-source Chart.js JavaScript library for data visualization, including line charts, bar charts, doughnut charts, radar charts, polar area charts, bubble charts, pie charts, and scatter charts. It is made to be adaptable and simple to use.

required to guide the investors to invest carefully in the stocks.

- visualizing stocks is a dangerous trend that may frequently lead to erroneous value projections, owing to how many aspects it is dependent on.

- with the assistance of an expert in the field, this project may be expanded and improved in the future by learning the model on new characteristics and integrating some essential non-numerical features as well.

Stock price prediction is challenging since there are several elements that might influence a stock's price. Machine learning algorithms can aid in stock price prediction, but they have limits. The human component is one of the limits. Forecasting the price of a stock is considerably easier than forecasting the price of a stock, which is far more difficult. The model must have several inputs in order to forecast. There are so many variables in prediction - physical vs. psychological, rational vs. illogical action, and so on. All of these factors combine to make share prices unpredictable and difficult to anticipate with great accuracy.



## V. CONCLUSION

Stock market AI Trading is the most sought after and so its popularity is increasing and researchers ought to find new techniques for prediction. Stock forecasting and visualizing techniques help investors and individuals to handle the stock market. For predicting the stock prices correctly the forecasting model should have great precision. In this project we used deep learning models and LSTMs and RNN units for predicting the stock prices accurately that assists the investors or individuals with correct knowledge about the situation of the stock market. The scope of visualizing and forecasting stock is very huge in the field of stock market. According to a recent report the number of investors investing in the stock market is increasing every year, therefore a system of visualizing and forecasting stocks is required to guide the investors to invest carefully in the stocks. Visualizing stocks is a dangerous trend that may frequently lead to erroneous value projections, owing to how many aspects it is dependent on. With the assistance of a subject matter expert, this project may be expanded and improved in the future by training the model on new characteristics and integrating some essential non-numerical features as well.

## IV. ADVANTAGES AND LIMITATIONS

- Stock market Trading is the most sought after and so its popularity is increasing and researchers ought to find new techniques for prediction.
- Stock forecasting and visualizing techniques help investors and individuals to handle the stock market. For predicting the stock prices correctly the forecasting model should have great precision.
- In this project we used deep learning models and LSTMs and RNN units for predicting the stock prices accurately that assists the investors or individuals with correct knowledge about the situation of the stock market.
- The scope of visualizing and forecasting stock is very huge in the field of stock market.
- According to a recent report the number of investors investing in the stock market is increasing every year, therefore a system of visualizing and forecasting stocks is

## VI FUTURE SCOPE

This project may have a very broad future scope. The project can be expanded to include additional capabilities including sentiment analysis of news articles, social media posts, and other information sources that may impact stock prices. It can be expanded to include more sophisticated machine learning techniques to raise forecast accuracy.

Other financial instruments, including commodities and currencies, can also be predicted using the project. The direction of the stock market may be predicted with the use of sentiment analysis of news items and social media posts. For instance, if there is a lot of unfavourable attitude towards one stock in particular, this may be a sign that the stock price will decline. Similar to the last example, if there is a lot of good emotion surrounding a specific stock, it may be a sign that the stock price will increase. The accuracy of the forecasts may be increased by using more parameters, such as market trends and historical data, in advanced machine learning algorithms. Other financial instruments, including commodities and currencies, may also be predicted using the project.

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