

A Project Report On VISUALIZING AND FORECASTING OF STOCKS

**A Dissertation submitted to JNTU Hyderabad in partial fulfillment of the
academic requirements for the award of the degree.**

Bachelor of Technology

IN

Computer Science and Engineering

Submitted by

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CERTIFICATE

This is to certify that the Mini Project-1 report entitled "**VISUALIZING AND FORECASTING OF STOCKS**" being submitted by **A. Bhanu prasad (20H51A0528), T. Sachit (20H51A0552), Balaji (20H51A0531)** in partial fulfillment for the award of **Bachelor of Technology in Computer Science and Engineering** is a record of bonafide work carried out his/her under my guidance and supervision.

The results embody in this project report have not been submitted to any other University or Institute for the award of any Degree.

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DECLARATION

We hereby declare that results embodied in this Report of Project on **“VISUALIZING AND FORECASTING OF STOCKS”** are from work carried out by using partial fulfillment of the requirements for the award of B. Tech degree. We have not submitted this report to any other university/institute for the award of any other degree.

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ABSTRACT

- The stock market is a transformative, non-straight dynamical and complex system, long term investment is one of the major investment decisions.
- In modern financial market, the most crucial problem is to find essential approach to outline and visualizing the predictions in stock-markets made by individuals in order to attain maximum profit by investments.
- Though, evaluating shares and calculating elementary values for companies for long term investment is difficult. In this paper we are going to present comparison of machine learning aided algorithms to evaluate the stock prices in the future to analyse market behaviour.
- Our method is to correctly use machine learning algorithm and to predict the future stock market prices in the market.

1. INTRODUCTION

- Exchanging the stocks on money markets is one of the significant practiced exercises, in current scenario many scientists developed different stock forecasting systems that could give insight to them to envision the stock prediction development.
- Predicting and foreseeing of significant worth future cost, in perspective of the present cash related information and news, is of significant use to the financial advisors and users.
- Financial users always want to know when stock will get higher or lower over particular time so, to obtain such informational output we use machine learning algorithm.
- Using the given output, we can achieve higher levels of probability of predicting the stocks of future cost.

OBJECTIVE

We have created a single page web application using dash and machine learning models. The main goal of this project is to precisely predict the future closing price of stock over a period of time in future.

EXISTING SOLUTIONS

The Current System is a computerized system but which is maintained at individual databases. The system doesn't provide complete online services like online reports, and centralized databases. In the current all the data is maintained mostly manual and in Excel Sheets. The data security and data accessing is very slow.

Drawbacks in existing system:

- The data accessing from the database is very slow.
- The current system takes time in retrieving a single record from the database.

PROPOSED SYSTEM

PROPOSED SOLUTION:

As per prediction system, developed in the stock price prediction to help investors in making financial decisions. In most researches it focuses on "lowest price buy", "highest selling price". On the "lowest buy" and "highest selling" strategy of stocks occurs when stocks are at the lowest price and sell shares when prices are highest. In this project we have used dash html components and dash core components to create website's structure and for enhancing the site's UI we have used CSS for styling. Plots of data are generated by using the plotly library of python and the data is fetched using yfinance. Machine learning models are implemented for predicting the stock price for the dates requested by the user. For this project we will be using a Long Short-Term Memory network – usually just called “LSTMs” to predict the closing price using a data set of past prices. we have learned to use it because it is very advanced and performs this task very accurately and the result is more accurate. The output of the proposed system is to predict the list of stock price. At the end of system, the user can view the final result of predicted value of stock market.

Advantages of Proposed system:

- This system provides fast data accessing when compared to the current system.
- Here we can use the custom number of days to forecast the stocks unlike limited number of days and the model is user friendly.

DESCRIPTION

- Our project can tell in a very precise way where the market will move by analyzing things. We did this work by taking data from yfinance.
- We imported this data through library and analyzed with the help of machine learning model and we did it with a machine learning model because it does this thing very precisely.
- In this project we have used dash html components and dash core components to create website's structure and for enhancing the site's UI we have used CSS for styling. Plots of data are generated by using the plotly library of python and the data is fetched using yfinance.
- We imported this data through library and analysed with the help of machine learning model and we did it with a machine learning model because it does this thing very precisely.
- In this we have used the model of Deep Learning LSTM, we have trained the data in its own way, we have learned to use it because it is very advanced and performs this task very accurately and the result is more accurate.

SYSYEM REQUIREMENTS

HARDWARE REQUIREMENTS:

HARDWARE SPECIFICATION:	SERVER
PROCESSOR:	INTEL P-IV (OR ABOVE)
RAM:	512 MB (OR ABOVE)
HARD DISK:	1 GB (OR ABOVE)
CLIENT PROCESSOR:	CELERON 500 MHZ OR MORE, INTEL PENTIUM III (OR ABOVE)
RAM:	128 MB RAM (OR ABOVE)
HARD DISK:	1 GB (OR ABOVE)

SOFTWARE REQUIREMENTS:

OPERATING SYSTEM:	WINDOWS 7/8/10 or LINUX
PLATFORM:	VISUAL STUDIO CODE
PROGRAMMING LANGUAGE:	PYTHON, CSS
FRONT END:	PLOTLY DASH

MODULES IN SYSTEM

Integrating the modules of a stock visualising and forecast delivers a more efficient result and improves financial performance. It is more critical than ever to have the right hotel software in place because the hotel industry depends heavily on digital data. And many of facets of hotel management take place online. Hotels widely use PMS software to manage daily operations from a single location. But when you integrate it with other crucial software solutions, then you will deliver specialized solutions, It is difficult to divide the functions of PMS in to a more or less important task because every task is necessary.

- Indicators
- Stock Price
- Forecast

PROCESS LOGIC OF EACH MODULE

INDICATORS: Indicators are statistics used to measure current conditions as well as to forecast financial or economic trends. Here we are using EMA indicators, The exponential moving average (EMA) is a technical chart indicator that tracks the price of an investment (like a stock or commodity) over time. The EMA is a type of weighted moving average (WMA) that gives more weighting or importance to recent price data.

STOCK PRICE: The user can use stock price button to get the specific stock's opening and closing prices, here we are going to use the yfinance python library to get company information and stock price history. Dash's call-back functions will be used to trigger updates based on change in inputs.

FORECAST: It is done based on movements of previous stock price, we can make dynamic plots of the financial data of a specific company by using the tabular data provided by yfinance python library.

HOW IT WORKS

VISUALIZING:

Fetching company data: To fetch the data the client has to enter the stock code where yfinance gives company's name, logo, description. The description contains all the necessary details about the company background.

Visualizing the stock price: It will show the opening and closing market price of the stocks by virtual representation through graphs. The opening and closing is fetched from yfinance.

The data is plotted using plotly (the plotly python library is an interactive, open source plotting library) library. Where the y-axis represents the price of a stock and x-axis represents time.

Indicators: These are used to identify direction of the trend to improve odds and go with the flow. There are many indicators, in Technical analysis of trading, but the popular one EMA (Exponential Moving Averages). It is similar to Simple Moving Averages (SMA) but gives more weightage on most recent data, which gives more accurate trend in which stock will move. These EMA values are plotted on a graph which will show the average stock price movement in last few days.

FORECASTING:

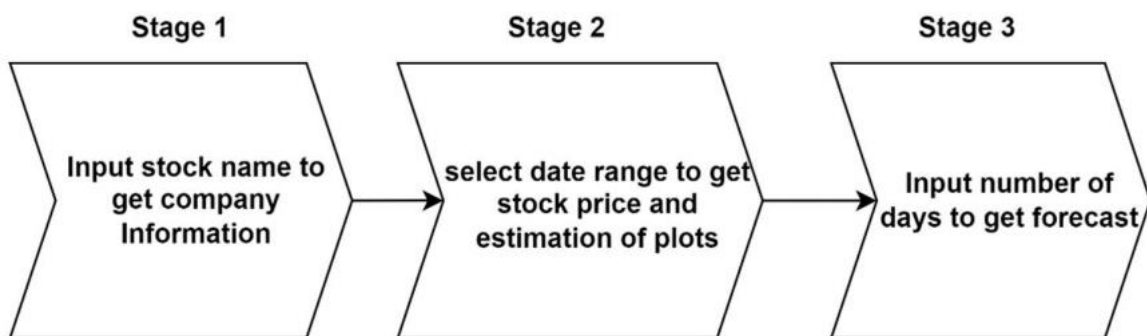
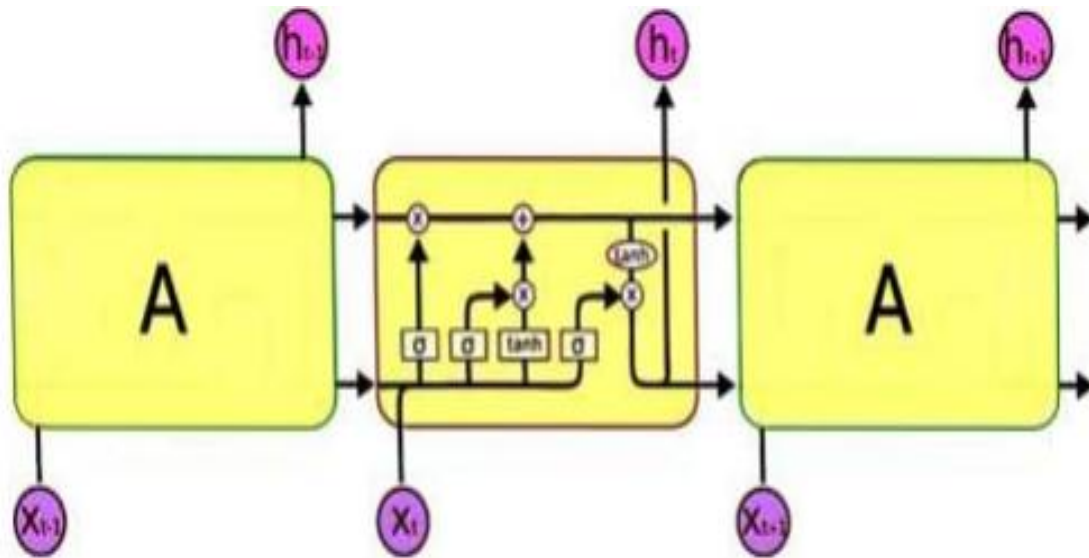
Dataset Creation: To build the stock price prediction model, we will use the yfinance dataset. This is a dataset of yahoo which contains the information of various day to day stock prices, we use this series of data to forecast the stocks information. The data should be indexed by continuous stretches of time so that trend, seasonality, cyclicity, and similar such time-based components can be captured to understand what the stock price would be in the immediate or medium-term future.

Data Pre-Processing: Whenever training time series data we should divide the data differently we should train the data with respective date. Always in time-series data the one data is dependent on other data.

- We have created a single page web application using dash and machine learning models.
- In this project we have used dash html components and dash core components to create website's structure and for enhancing the site's UI we have used CSS for styling. Plots of data are generated by using the plotly library of python and the data is fetched using yfinance.
- We imported this data through library and analysed with the help of machine learning model and we did it with a machine learning model because it does this thing very precisely.

DIAGRAM

Network Architecture:



5. RESULTS AND DISCUSSIONS

TECHNOLOGY USED:

DASH:

Dash is a Python framework for building analytical web applications. Dash helps in building responsive web dashboards that is good to look at and is very fast without the need to understand complex front-end frameworks or languages such as HTML, CSS, JavaScript.

CASCADING STYLE SHEETS:

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications

MACHINE LEARNING MODEL:

The Long Short-Term Memory network, or LSTM for short, is a type of recurrent neural network that achieves state-of-the-art results on challenging prediction problems.

Working Prototype Images

Start Date → 11/02/2022

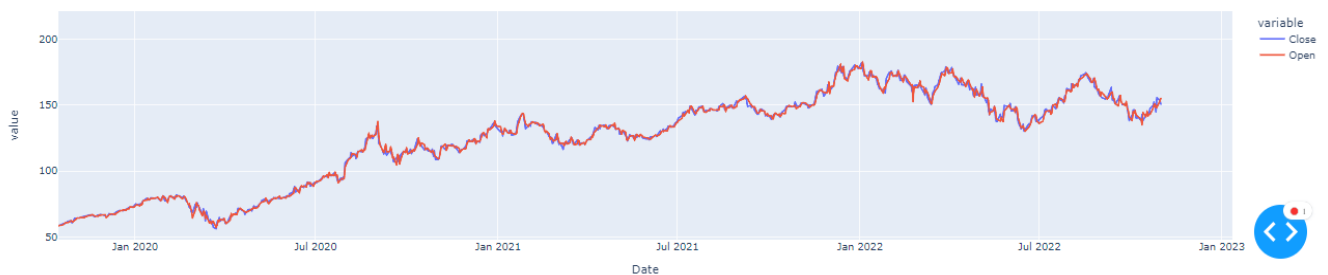
Stock Price Indicators number of days Forecast



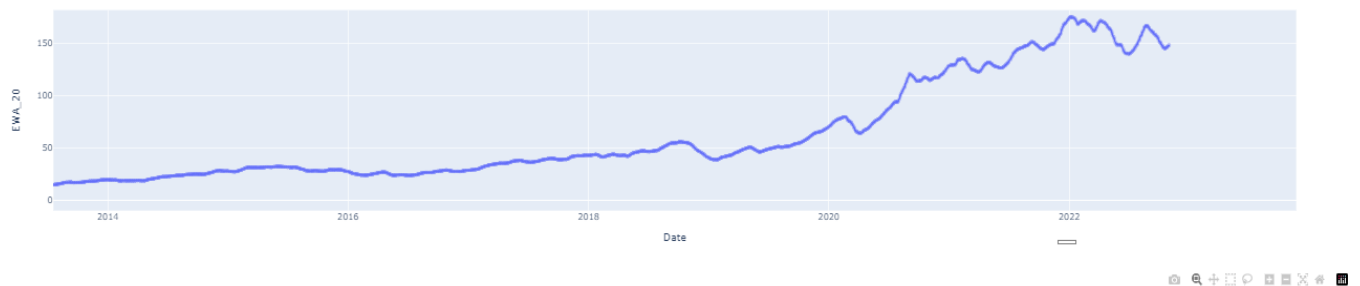
Apple Inc.

Apple Inc. designs, manufactures, and markets smartphones, personal computers, tablets, wearables, and accessories worldwide. It also sells various related services. In addition, the company offers iPhone, a line of smartphones; Mac, a line of personal computers; iPad, a line of multi-purpose tablets; and wearables, home, and accessories comprising AirPods, Apple TV, Apple Watch, Beats products, and HomePod. Further, it provides AppleCare support and cloud services store services; and operates various platforms, including the App Store that allow customers to discover and download applications and digital content, such as books, music, video, games, and podcasts. Additionally, the company offers various services, such as Apple Arcade, a game subscription service; Apple Fitness+, a personalized fitness service; Apple Music, which offers users a curated listening experience with on-demand radio stations; Apple News+, a subscription news and magazine service; Apple TV+, which offers exclusive original content; Apple Card, a co-branded credit card; and Apple Pay, a cashless payment service, as well as licenses its intellectual property. The company serves consumers, and small and mid-sized businesses; and the education, enterprise, and government markets. It distributes third-party applications for its products through the App Store. The company also sells its products through its retail and online stores, and direct sales force; and third-party cellular network carriers, wholesalers, retailers, and resellers. Apple Inc. was incorporated in 1977 and is headquartered in Cupertino, California.

Closing and Opening Price vs Date



Exponential Moving Average vs Date



Predicted Close Price of next 60 days




FUTURE SCOPE

As per the user Requirement our whole project is designed. We can add an additional constraint to our project. We will also try to make the modifications for machine learning model in our project.

Some of them are:


- The LSTM model can be tuned for various parameters such as changing the number of LSTM layers, adding dropout value or increasing the number of epochs.
- This project can be extended and modified in future by training the model on more features and including some important nonnumeric features as well with the help of a subject matter expert.
- There is a drawback in this that it will work the way we trained it. We have to face a lot of difficulty in trained the data because the model cannot make any changes in itself like the data is transcribed, it works the same way.


Screenshots of Execution

 **VFS**
get accurate forecasting!


Welcome to the Stock Dash App!

Hey there! Please enter a legitimate stock code to get details.




 **VFS**
get accurate forecasting!

Welcome to the Stock Dash App!

 **Apple Inc.**

Apple Inc. designs, manufactures, and markets smartphones, personal computers, tablets, wearables, and accessories worldwide. It also sells various related services. In addition, the company offers iPhone, a line of smartphones; Mac, a line of personal computers; iPad, a line of multi-purpose tablets; and wearables, home, and accessories comprising AirPods, Apple TV, Apple Watch, Beats products, and HomePod. Further, it provides AppleCare support and cloud services store services; and operates various platforms, including the App Store that allow customers to discover and download applications and digital content, such as books, music, video, games, and podcasts. Additionally, the company offers various services, such as Apple Arcade, a game subscription service; Apple Fitness+, a personalized fitness service; Apple Music, which offers users a curated listening experience with on-demand radio stations; Apple News+, a subscription news and magazine service; Apple TV+, which offers exclusive original content; Apple Card, a co-branded credit card; and Apple Pay, a cashless payment service, as well as licenses its intellectual property. The company serves consumers, and small and mid-sized businesses; and the education, enterprise, and government markets. It distributes third-party applications for its products



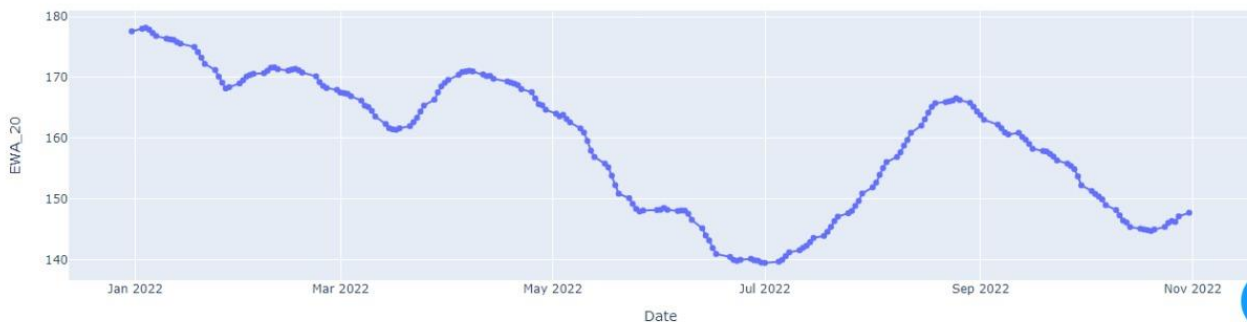
various services, such as Apple Arcade, a game subscription service; Apple Fitness+, a personalized fitness service; Apple Music, which offers users a curated listening experience with on-demand radio stations; Apple News+, a subscription news and magazine service; Apple TV+, which offers exclusive original content; Apple Card, a co-branded credit card; and Apple Pay, a cashless payment service, as well as licenses its intellectual property. The company serves consumers, and small and mid-sized businesses; and the education, enterprise, and government markets. It distributes third-party applications

Closing and Opening Price



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Exponential Moving Average (EMA)





CONCLUSION

- 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 technique helps investors and individuals to handle 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 stock market.
- Visualizing stocks is a risky trend and can often lead to inaccurate value predictions mainly because of how many factors it depends upon so, this model decreases the risk by providing the forecasting output.

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THANK YOU