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Visualising and Forecasting Stocks using Dash

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Abstract: *In this project we attempt to implement machine learning approach to predict stock prices. Machine learning is effectively implemented in forecasting stock prices. The objective is to predict the stock prices in order to make more informed and accurate investment decisions. We propose a stock price prediction system that integrates mathematical functions, machine learning, and other external factors for the purpose of achieving better stock prediction accuracy and issuing profitable trades. There are two types of stocks. You may know of intraday trading by the commonly used term "day trading." Interday traders hold securities positions from at least one day to the next and often for several days to weeks or months. LSTMs are very powerful in sequence prediction problems because they're able to store past information. This is important in our case because the previous price of a stock is crucial in predicting its future price. While predicting the actual price of a stock is an uphill climb, we can build a model that will predict whether the price will go up or down.*

Keywords: LSTM, CNN, ML, DL, Trade Open, Trade Close, Trade Low, Trade High

I. INTRODUCTION

The financial market is a dynamic and composite system where people can buy and sell currencies, stocks, equities and derivatives over virtual platforms supported by brokers. The stock market allows investors to own shares of public companies through trading either by exchange or over the counter markets. This market has given investors the chance of gaining money and having a prosperous life through investing small initial amounts of money, low risk compared to the risk of opening new business or the need of high salary career. Stock markets are affected by many factors causing the uncertainty and high volatility in the market. Although humans can take orders and submit them to the market, automated trading systems (ATS) that are operated by the implementation of computer programs can perform better and with higher momentum in submitting orders than any human. However, to evaluate and control the performance of ATSs, the implementation of risk strategies and safety measures applied based on human judgements are required. Many factors are incorporated and considered when developing an ATS, for instance, trading strategy to be adopted, complex mathematical functions that reflect the state of a specific stock, machine learning algorithms that enable the prediction of the future stock value, and specific news related to the stock being analysed. Time series prediction is a common technique widely used in many real-world applications suchas weather forecasting and financial market prediction. It uses the continuous data in a period of time to predict the result in the next time unit. Many timeseries prediction algorithms have shown their effectiveness in practice. The most common algorithms now are based on Recurrent Neural Networks (RNN), as well as its special type - Long-short Term Memory (LSTM) and Gated Recurrent Unit (GRU). Stock market is a typical area that presents time-series data and many researchers study.

1.1 Motivation:

Primarily run over customer's satisfaction, customer reviews about their products. Shifts in sentiment on social media have been shown to correlate with shifts in stock markets. Identifying customer grievances thereby resolving them leads to customer satisfaction as well as trustworthiness of an organization. Hence there is a necessity of an un biased automated system to classify customer reviews regarding any problem. In today's environment where we're justifiably suffering from data overload (although this does not mean better or deeper insights), companies might have mountains of customer feedback collected; but for mere humans, it's still impossible to analyse it manually without any sort of error or bias. Oftentimes, companies with the best intentions find themselves in an insights vacuum. You know you need insights to inform your decision making and you know that you're lacking them, but don't know how best to get them. Sentiment analysis provides some answers into what the most important issues are, from the perspective of customers,

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at least. Because sentiment analysis can be automated, decisions can be made based on a significant amount of data rather than plain intuition.

II. DESCRIPTION OF THE PROBLEM

2.1 Problem Definition

Time Series forecasting &modelling plays an important role in data analysis. Time series analysis is a specialized branch of statistics used extensively in fields such as Econometrics & Operation Research. Time Series is being widely used in analytics & data science. Stock prices are volatile in nature and price depends on various factors. The main aim of this project is to predict stock prices using Long short term memory (LSTM).

2.2 Project Idea

To enter the share market as a trader or investor, you must open a demat account or brokerage account. Without a demat account you cannot trade in the stock market. The demat account works like a bank account where you hold money to use for trading.

2.3 Purpose

- Stock market prediction is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange. The successful prediction of a stock's future price could yield significant profit.
- There are two ways one can predict stock price. One is by evaluation of the stock's intrinsic value. Second is by trying to guess stock's future PE and EPS.
- We proposed an online web-based application using learning model for predicting the price of a given stock. The challenge of this project is to accurately predict the future closing value of a given stock across a given period of time in the future. For this project we will be using a Long Short-Term Memory network usually just called “LSTMs” to predict the closing price of the S&P 500 using a data set of past prices.

2.4 Objectives

We will be creating a single-page web application using Dash (a python framework) and some machine learning models which will show company information (logo, registered name and description) and stock plots based on the stock code given by the user. Also the ML model will enable the user to get predicted stock prices for the date inputted by the user.

III. LITERATURE REVIEW

Authors	Region/ Country/ Scope	Methodology	Major Findings
Levine (1997)	77 countries (1960–1989)	Cross-section regression analysis	Financial market directly enhanced long-run growth through financial intermediaries.
Vazakidis and Adamopoulos (2009)	France (1965-2007)	Granger causality and Vector Error Correction Model (VECM)	Positive impact Causality direction - Economic growth to Stock market development
Mishra et al. (2010)	India (1991: Q1 – 2010: Q1)	Multiple regression-ordinary least square	Positive impact – capital market to output growth

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IV. SYSTEM DESIGN AND FLOW

Security has always been an integral part of human life. People have been looking for physical and financial security. With the advancement of human knowledge and getting into the newer at the need of information security were added to hum an security concerns. We are developing banking application using Location Based Encryption. As compare to current banking application which are location independent, we are developing banking application which is location dependent. It means User can perform transaction only if he/she is with in TD region. TD region is area of Toleration Distance (TD) where user can perform transaction. If user go out of TD region then transaction will terminate automatically. In our system user register himself/ herself in our application. He/she provide the personal details like name, mobile number, email id , secret bit, etc. then system will send the encrypted password to email. Encrypted password means "Secret bit" is added into the password, this is done to protect password from visualization. After entering correct user name and password user will login to system and get her secret key on registered email id. If user entered key is correct then OTP will receive on mobile by SMS. If entered OTP is correct then generate TD region. This TD region specify range in meters. After generation TD region successfully user can view account detail and User can perform money transaction operation. Our system is flexible enough to provide access to customer to his/her bank account from any location. Our system also provide solution to physical attack using virtualization, password send on email is encrypted by secret bit.

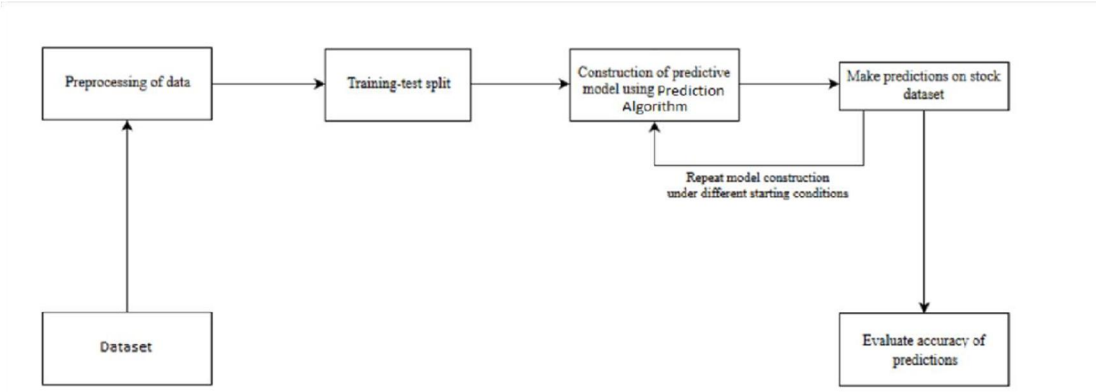

Fig. System Architecture

A description of the program architecture is presented. Subsystem design or Block diagram, Package Diagram, Deployment diagram with description is to be presented. Preprocessing of data

4.1 Structure Chart

A structure chart (SC) in software engineering and organizational theory is a chart which shows the breakdown of a system to its lowest manageable levels. They are used in structuredprogramming to arrange program modules into a tree. Each module is represented by a box, which contains the module's name.

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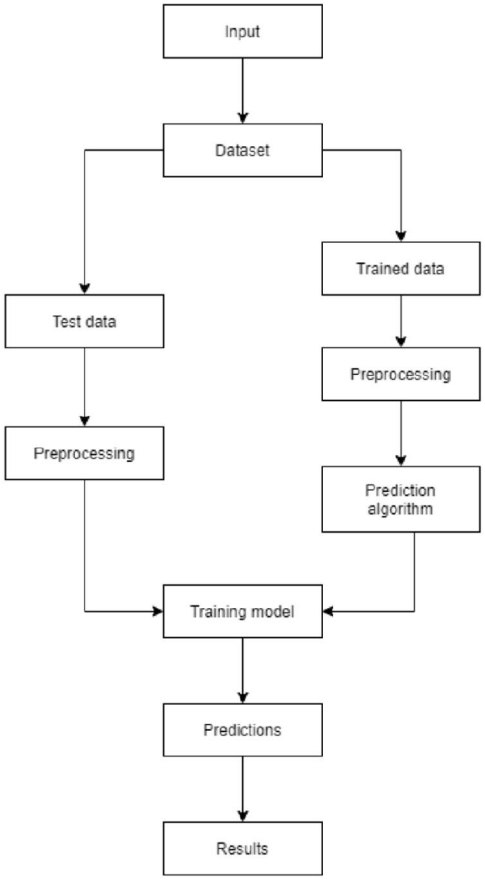

VI. PROJECT IMPLEMENTATION

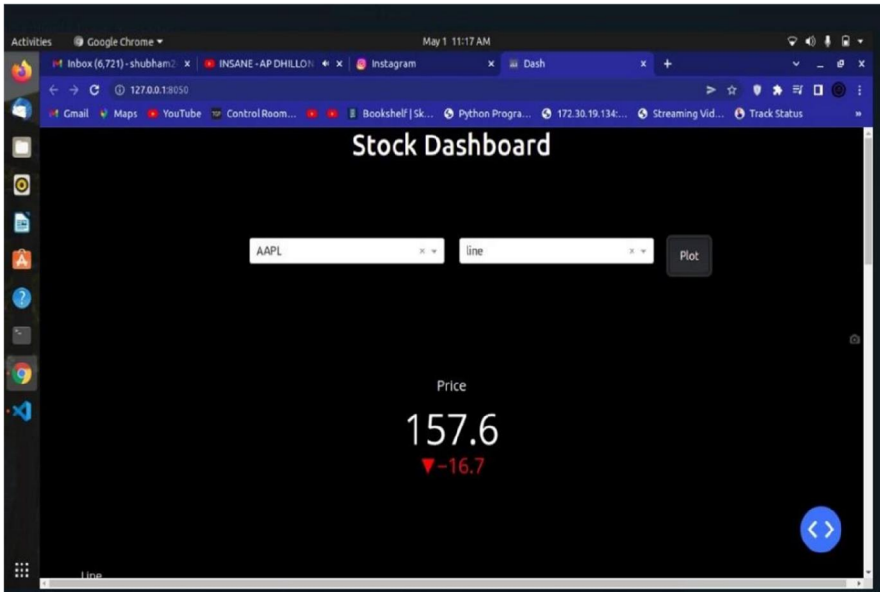

Fig. Data set and training

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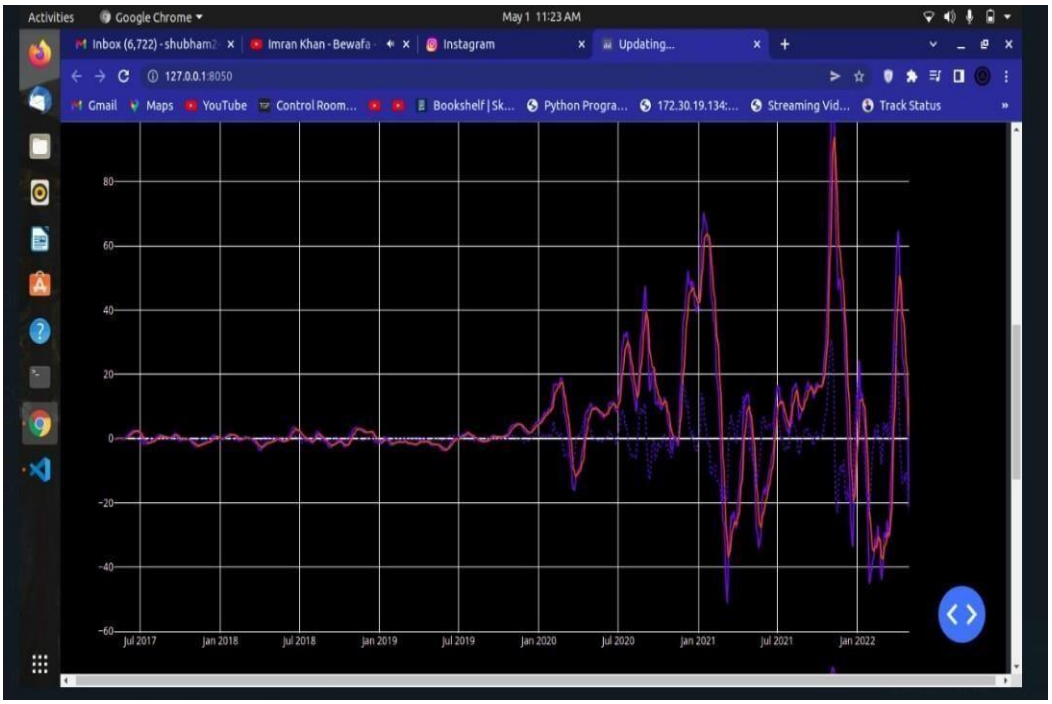

Fig. After Selecting a Dataset

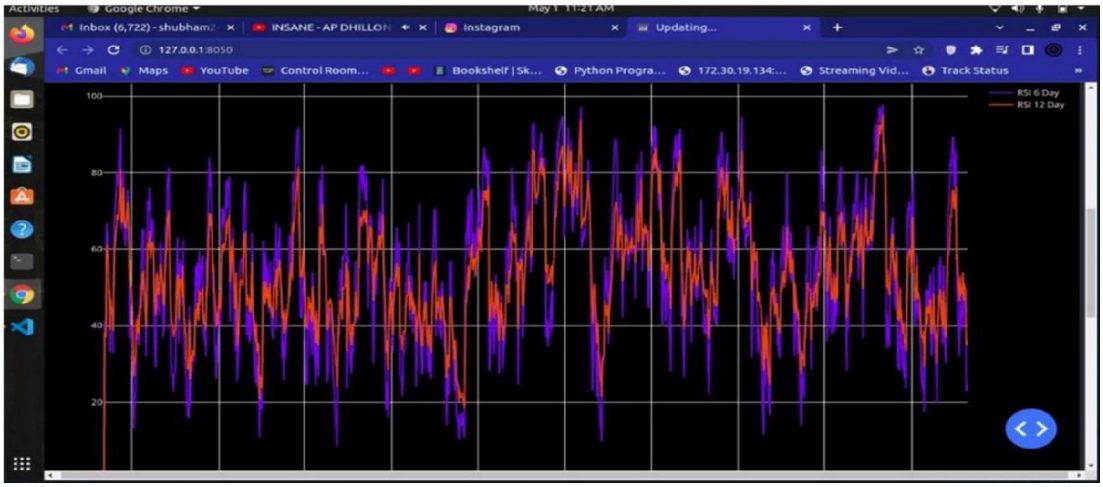

Fig. Graphical representation

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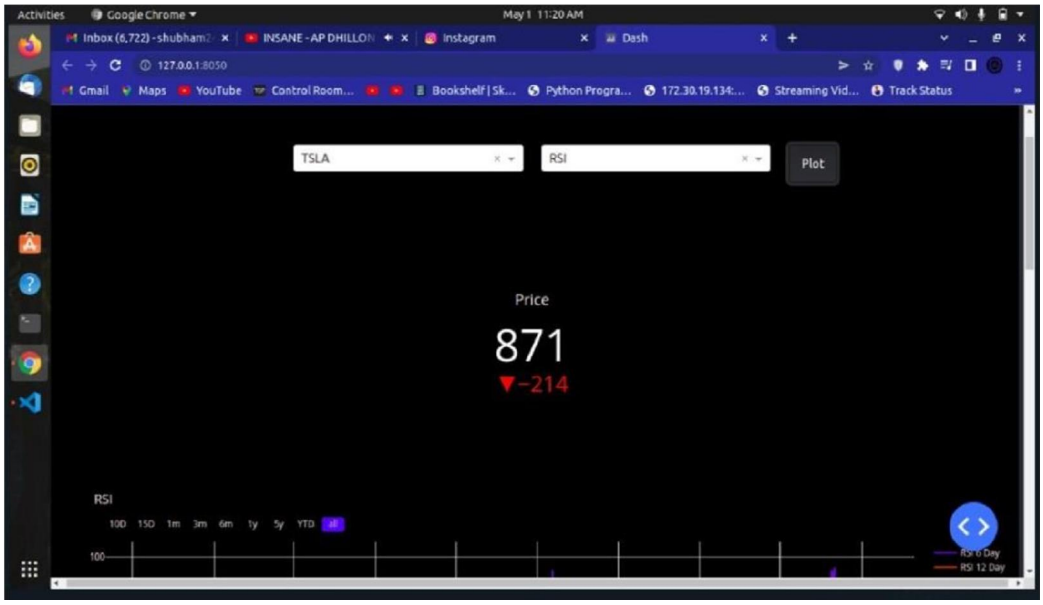

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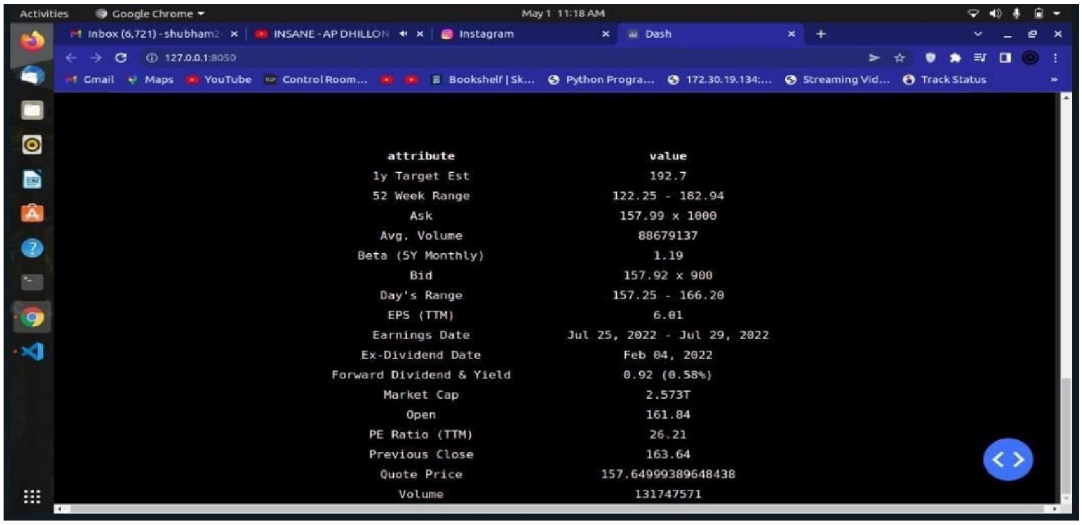
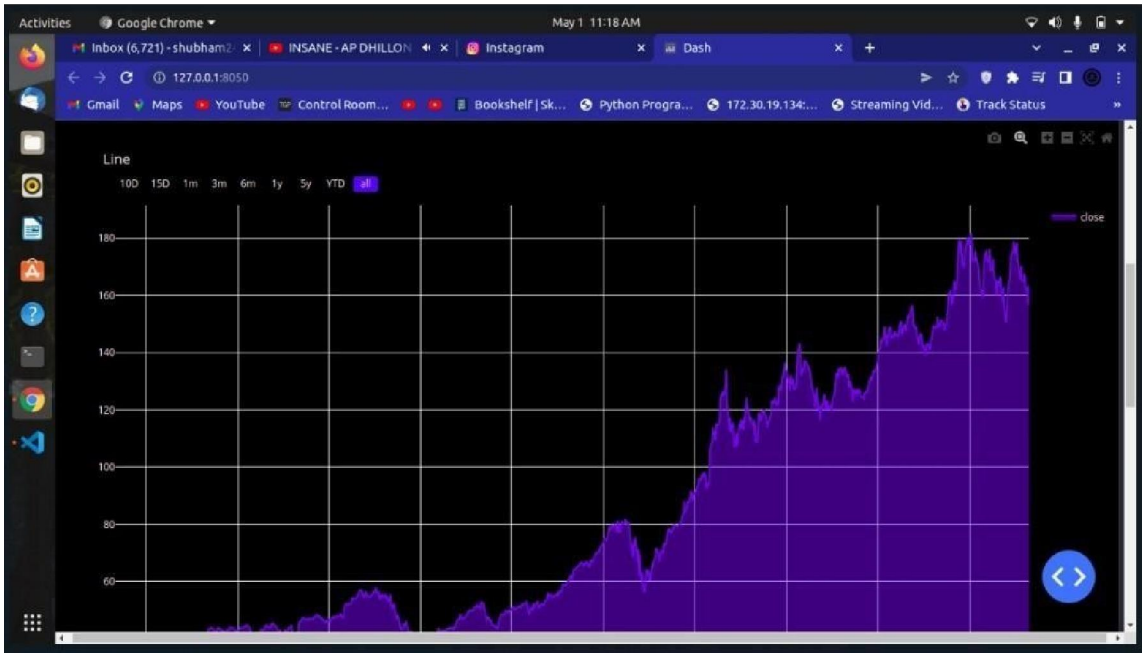


attribute	value
1y Target Est	192.7
52 Week Range	122.25 - 182.94
Ask	157.99 x 1000
Avg. Volume	88679137
Beta (5Y Monthly)	1.19
Bid	157.92 x 900
Day's Range	157.25 - 166.20
EPS (TTM)	6.01
Earnings Date	Jul 25, 2022 - Jul 29, 2022
Ex-Dividend Date	Feb 04, 2022
Forward Dividend & Yield	0.92 (0.58%)
Market Cap	2.573T
Open	161.84
PE Ratio (TTM)	26.21
Previous Close	163.64
Quote Price	157.64999389648438
Volume	131747571



VII. CONCLUSION & FUTURE WORK

To summarize, in this project, we attempt to build an automated trading system based on Machine Learning algorithms. Based on historical price information, the machine learning models will forecast next day returns of the target stock. A customized trading strategy will then take the model prediction as input and generate actual buy/sell orders and send them to a market simulator where the orders are executed. After training on available data at a particular time interval, our application will back test on out of sample data at a future time interval.

There commendations for future work areas follows:
We can analyze various stocks and study it. Also easily use to study and invest accordingly into various companies. Securities analysts evaluate securities markets and trends to identify high-yield assets for clients and companies. They

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may use resources such as bond performance reports, daily stock quotes, market and economic forecasts, and other financial statements and publications.

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The completion of our project brings with it a sense of satisfaction, but it is never complete without those people who made it possible and whose constant support has crowned our efforts with success. One cannot even imagine our completion of the project without guidance and neither can we succeed without acknowledging it. It is a great pleasure that we acknowledge the enormous assistance and excellent co-operation to us by the respected personalities.

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