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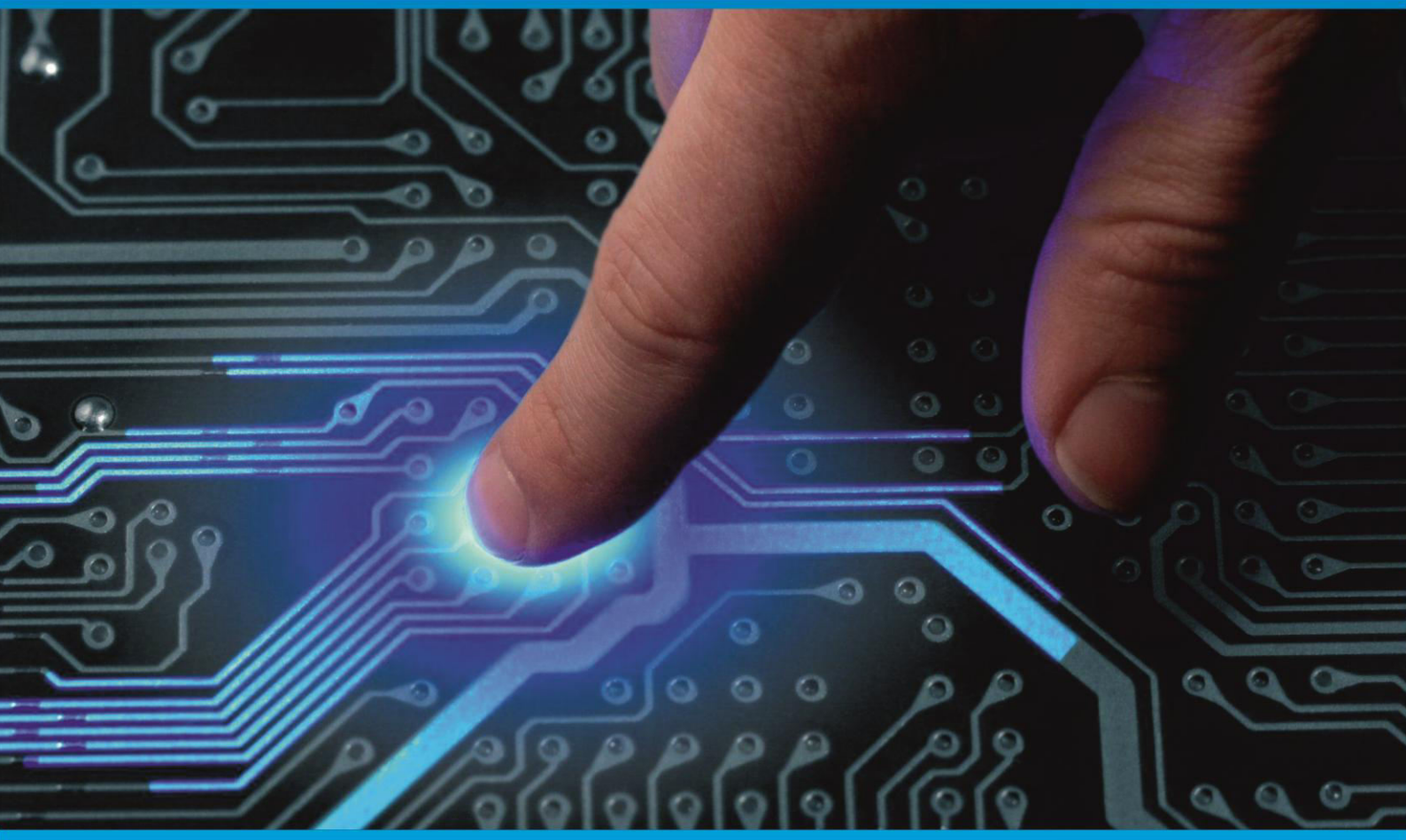

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Predicting the Stock Market Trends Using Machine Learning

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ABSTRACT*:* Stock markets are unpredictable because the fluctuations within the prices over time depend upon several factors. This makes the novice investors filled with doubts. Can I actually predict stock values with machine learning? If I glance to the stock markets through a microscopic lens, I will observe patterns that outline the generic evolution of the stock. Supporting those trends, I postulate that if I use Predictive Machine Learning Classifiers (e.g. Regression, Decision Tree, Random Forest, Long Short Term Memory networks) with stock data that spans over a long-enough period of time, I are able to approximately predict the behavior of the stocks and also the evolution of their prices over time. I will use *Keras and Tensor flow* to predict stock value using closing prices of the specific company and getting graphs of both the predicted stock values.

KEYWORDS*:* Stock markets, Machine learning, Closing prices

I. INTRODUCTION

Stock markets are one of the most interesting treasures of human civilization. As a matter of fact, in their basic definition they set the price on non-substantial assets related to the equity of some enterprise or a market. They are globally present and can define how Ill a country's economy is doing, set the value of the country's currency and decide if it is suitable for investments or not. From a simple investment perspective, the value of stocks is defined by the "value /supply" pattern. High value and low supply will cause the stock value to skyrocket while the opposite will make the value crash. HoIver, there are several factors that affect the stock market either favorably or unfavorably (Politics, company ethics and behaviors).The complications of stock markets affect the general public from investing in stock. They see that the market is volatile and that the risk exceeds the benefit. This sentiment is amplified by their lack of understanding about how the fluctuations go through. Those factors make the stock market very hard to predict.

In order to encourage people to speculate more within the stock, I attempted to create a program which will help in predicting the values of public company stocks and its fluctuations over an extended period of time. In fact, the tiny economical changes are very static and don't get affected heavily unless an unexpected event happens, like market crash or if a crisis triggers a panic. Thus I combine that theory with Long-Short Term Memory (LSTM) / Neural Network Algorithm classifiers so as to predict the trend of stock values within the future. During this project, I verify the reliability of our proposal by building the program and testing it against known stocks. Finally, I build a theoretical product that illustrates the way this project is often advertised and presented to the public.

II. LITERATURE SURVEY

The objective of this paper is to construct a model to predict stock "value /supply" pattern using the Long-Short Term Memory (LSTM) and Neural Network Algorithm methods to predict stock values. It uses domain specific approach to predict the stocks from each domain and takes some stock with maximum capitalization. The prediction has to be made for closing (Adjusted closing) price of the data at the end of the day. By examining both the results I get optimal parameters for the model.

Forecasting stock value may be a hot stock for stock investors, dealers and brokers. However, it is difficult to search out the simplest time point to take a position or to sell a stock, because many events can affect the stock exchange, and the stock dataset is a type of statistic data. Therefore, many statistic models are proposed for forecasting stock value. Furthermore, the previous statistic methods like classical regression methods such as linear regression and polynomial regression still have some problems.

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III. PROPOSED SYSTEM

I hope to provide a program suite that can model and predict the micro-fluctuations of the stock values from the historical data and comparing the accuracy of different Python Classifiers applied to stocks values to get the results, helping investors, dealers, brokers and beginners to understand the Stock Market Evolution.The stock market data I are using for our classifiers is publicly available with the API I used and I do not include any insider knowledge. The libraries, tools and frameworks I are using are also available under various Open-Source accesses that guarantee I can use them for either commercial or non commercial purposes.

IV. PSUEDO CODE

Step1: Set input to company name.
Step2: Print stock market data for the last six years of given input(input being company) .
Step3: Set index as close/high/low/open.
Step4: Plot graph for close/high/low/open.
Step5: Get training size from close/high/low/open.
Step6: Get test size from close/high/low/open.
Step7: Print training size and test size as two points as x and y respectively.
Step8: Compute RMSE (Root Mean Square Error).
Step9: Plot graph from test size for predicted data.
Step10: Plot graph for next 30 days by algorithm of last 6 yrs.

V. ACTUAL IMPLEMENTATION

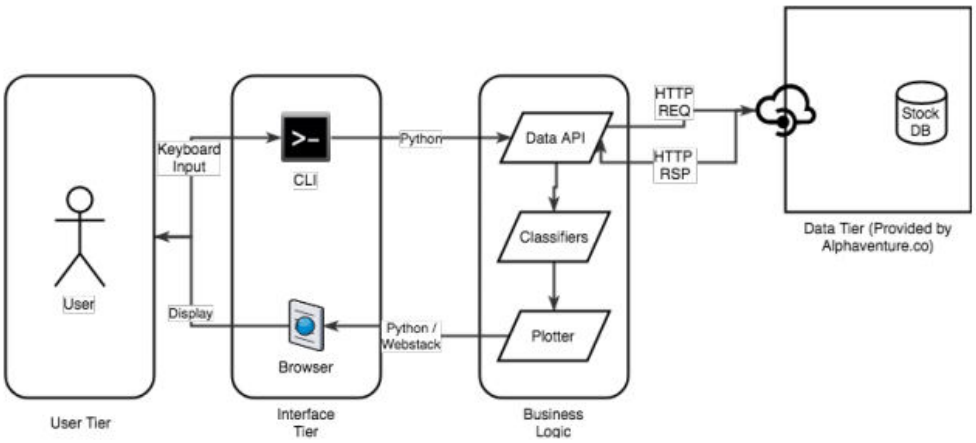
Overall Architecture of the System

From a high level perspective, the system is intended following a 3-tier Architecture

- **Userfacing Interface**
- **Business Logic Component**
- **Information Acquisition component**

The user interface allows the user to interact with the business logic, and that we are designing it as two components: the command-line interface (shell) for input and also the data-plotting interface (output). so as to form the implementation efficient, we have decided against having a more developed graphical computer program, because it isn't permitted by the time span of the project. It may be designed as future work, however. The Business logic interface consists of various Machine Learning Classifiers that we are comparing during this project. Each set of knowledge goes over the four classifiers we've chosen (i.e.Linear Regression, Decision Trees, Random Forest, Recurrent Neural Networks) so as to have different predictions from the identical data. Finally, the info acquisition component in an API client that acquires the stock exchange data from a 3rd party provider. we've got chosen a provider that will return a dataset that 7 is current, very detailed which we will easily process (In JSON format).

VI. RESULTS



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The following Figure (1) illustrates the overall architecture of the system and explains how the components integrate with one another .

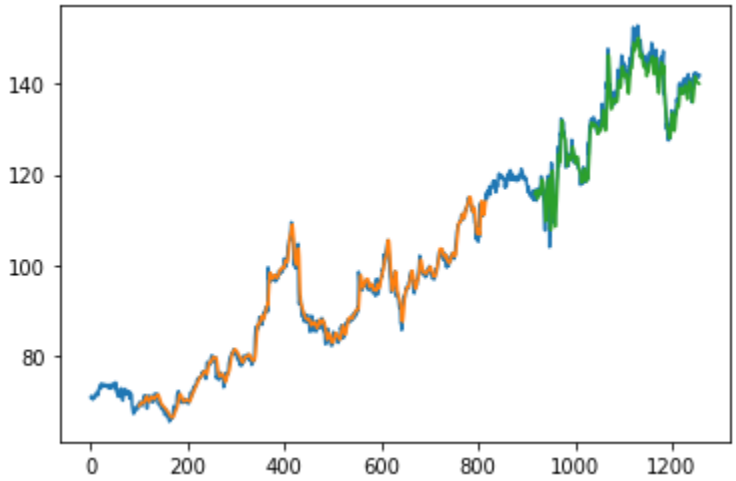

Fig 2: Green Predicted Prices For next 30 days

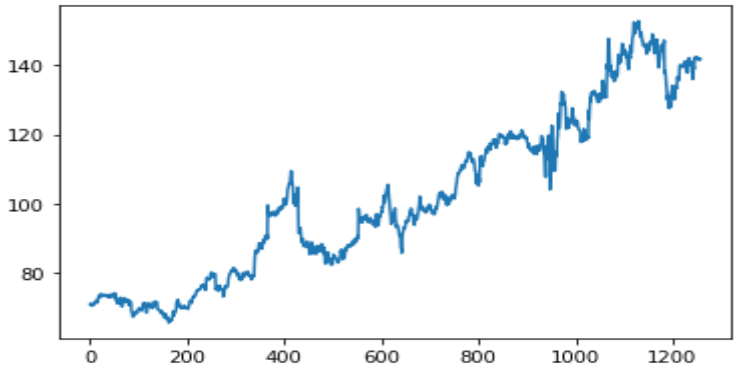

Fig 3: Testing Data

VII. CONCLUSION AND FUTURE WORK

I started this project with the hope to learn a completely new algorithm, i.e, Long-ShortTerm Memory and also to explore a real time series data set. The final model reallyexceeded my expectation and have worked remarkably well. I am greatly satisfied withthese results. The major problem i faced during the implementation of project was exploring the data. It was toughest task. To convert data from raw format to preprocess data and then tosplit them into training and test data required a great deal of patienceand very precise approach. In future more complex models can be used to predict data not just for couple days, but maybe in months, years or even decades to estimate whether a company will keep growing or will stop growing after a certain time.

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