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Stock Prediction using News Headlines

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ABSTRACT
In the finance world stock trading is one of the most important activities. Stock market prediction is an act of trying to determine the future value of a stock other financial instrument traded on a financial exchange. The programming language is used to predict the stock market using machine learning is Python. In this paper we propose a Machine Learning (ML)
approach that will be trained from the available stocks data and gain intelligence and then uses the acquired knowledge for an accurate prediction. In this context this study uses a machine learning technique called Support Vector (SVM) to predict the stock price for the large and small capitalization.

Keywords
Machine Learning, SVM, Classifier,
Random forest classifier

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I. INTRODUCTION

The trend in a stock market prediction is not a new thing and yet this issue is kept being discussed by various organizations. There are two types to analyse stocks which investors perform before investing in a stock, first is the fundamental analysis, in this analysis investors look at the intrinsic value of stocks, and performance of the industry, economy, political climate etc. to decide that whether to invest or not.On the other hand, the technical analysis it is an evolution of stocks by the means of studying the statistics generated by market activity, such as pastprices andvolumes. In the recent years, increasing prominence of machine learning in various industries have enlightened many traders to apply machine learning techniques to the field, and some of them have produced quite promising results.

II. LITERATURE SURVEY

For the development of this work, a review of two research papers were done. In [1] To identify the relationship between different existing time series algorithms namely ARIMA and Holt Winter and the stock prices is the main objective of the proposed work, for the investments a good risk-free range of stock prices are analysed and therefore better accuracy of the model can be seen. To find distinguished results for shares in the stock market, the combination of two different time series analysis models is opted by producing a range of prices to the consumer of the stocks. Not complex in nature and estimation of values which are purely based on the past stock prices for nonseasonal or seasonal is the main advantage of these models. In this experiment, some limitations are, the work that never takes into consideration and other circumstances like news about any new market strategy or media release relevant to any company which may get affected by the prices of stocks.

In [2], Stock market is basically nonlinear in nature and the research on stock market is one of the most important issues in recent years. People invest in stock market based on a few prediction. For predict, the stock market prices people search such approach and tools which will increase their profits, while minimize their risks. Prediction plays a very crucial role in stock market business which is very complicated and challenging

process. Employing universal methods like fundamental and technical analysis may not ensure the reliability of the prediction. To make predictions regression analysis is used mostly. In this paper we survey of well-known efficient regression approach to predict the stock market price from stock market data based. In future the results of multiple regression approach could be enhanced using more number of variables. other circumstances like news about which may get affected by the prices of a stock. To make prediction regression .

III. METHODOLOGY

The implementation is one phase of software development. Implementation is that stage in the project where theoretical design is turned into working system. Implementation involves placing the complete and tested software system into actual work environment. Implementation is concerned with translating design specification with source code. The primary goal of implementation is to write the source code to its specification that can be achieved by making the source code clear and straight forward as possible.

Implementation means the process of converting a new or revised system design into operational one. The implementation is the final stage and it's an important phase. It involves the individual programming, system testing, user training and the operational running of developed proposed system that constitute the application subsystems. One major task of preparing for implementation is education of users, which should really have been taken place much earlier in the project when they were being involved in the investigation and design work. During this implementation phase system actually takes physical shape.

3.1 Classification

Classification is an instance of supervised learning where is a set is analysed and categorized based on a common attribute. From the values or the data are given, classification draws some conclusion from the observed value. It can be performed on both structured and unstructured data.Classification belongs to the category of supervised learning where the targets also provided with the input data. There are many applications in classification in many domains such as in credit approval, medical diagnosis, target marketing etc.

3.2 SVM

SVM classifier is a type of discriminative classifier. The SVM uses supervised learning that is labelled training data. The outputs are hyperplanes which categorizes the new dataset. They are supervised learning models the uses associated learning algorithm for classification and as well as regression.

3.3 Random Forest classifier

Random Forest is a popular machine learning algorithm that belongs to the supervised learning technique. It can be used for both Classification and Regression problems in ML. It is based on the concept of ensemble learning, which is a process of combining multiple classifiers to solve a complex problem and to improve the performance of the model. As the name suggests, "Random Forest is a classifier that contains a number of decision trees on various subsets of the given dataset and takes the average to improve the predictive accuracy of that dataset." Instead of relying on one decision tree, the random forest takes the prediction from each tree and based on the majority votes of predictions, and it predicts the final output. random forest combines multiple trees to predict the class of the dataset, it is possible that some decision trees may predict the correct output, while others may not.

working

The aim of the paper is to predict future stock prices of stocks. Random forest algorithm is used for the prediction. The training data is divided into training and testing sets which finally is used for validation.

IV. EXPERIMENT AND RESULTS

The Stock prediction algorithm showed improved accuracy when implemented. The Resnet152 dataset was split into 6552 training images, 409 for validation and 409 for testing. Through the research, the result obtained at each epoch was observed. At epoch 1,we have training loss at 2.994, test loss is 2.343 and the test accuracy we get is 42%, then we continued the process until we observed the best accuracy result possible. It could be noted that at epoch 10, we achieved an accuracy of 94.2% where the training loss was at 0.321 and test loss at 0.26. Hence, we can conclude that the test loss and training loss decreases after each epoch and the test accuracy is increased.

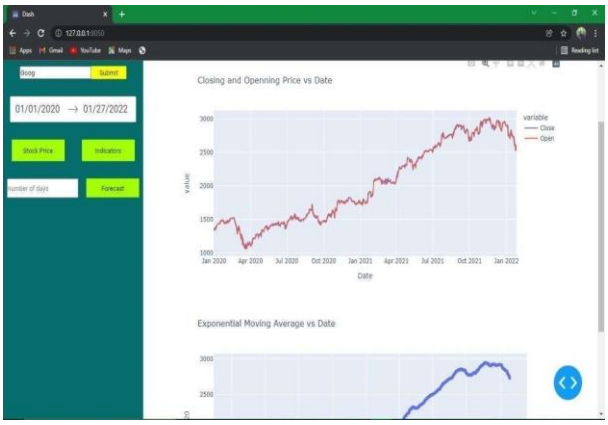
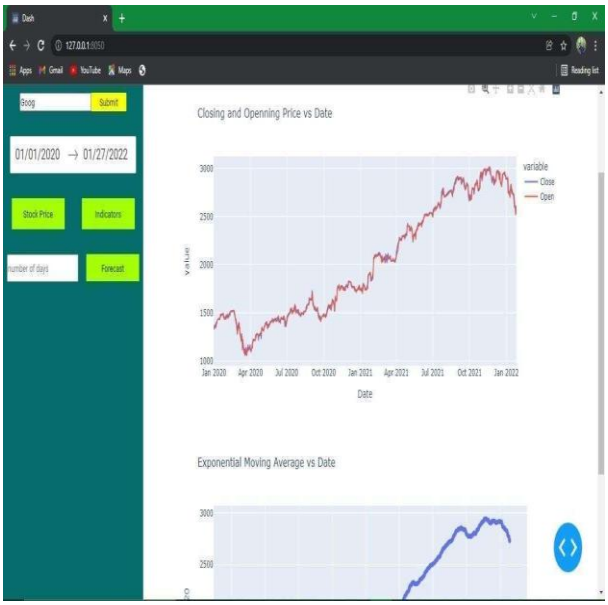


Fig1: closing and opening price vs Date



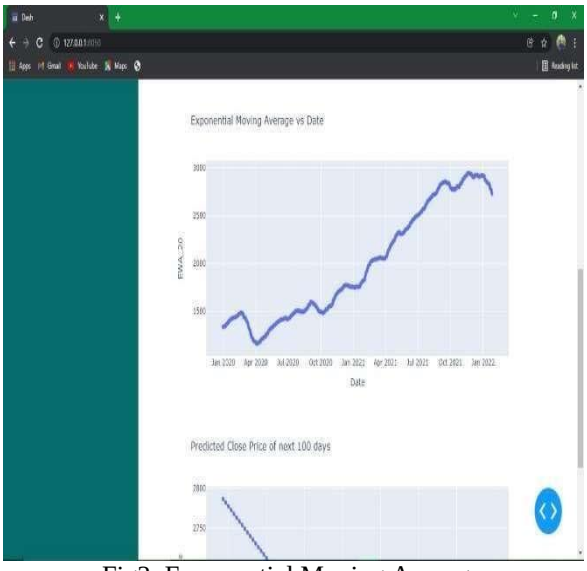


Fig2: Exponential Moving Average

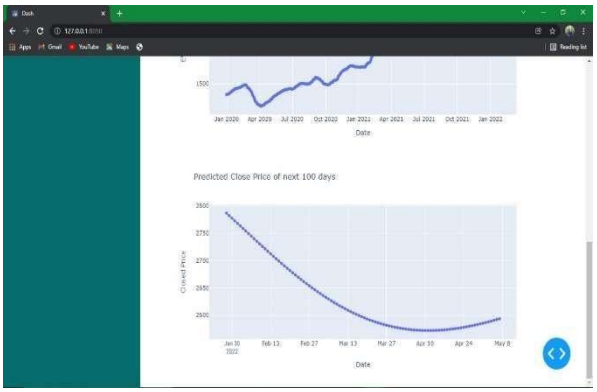


Fig3: Predicted close price of next 100 days

V. FUTURE SCOPE AND CONCLUSION

An attempt has been made to develop an effective stock market predictive model that forecasts the next day's trend using Tensor flow and Kera's, the model predictions are far by over $20 to the true prices, this will vary from ticker to another, as prices get larger, the error will increase as well. Therefore, you can only use this metric to compare the models when the ticker is stable.We would like to extend this research by adding more company's data and check the prediction accuracy.

For those companies where availability of financial news is a challenge, we would be using twitter data for similar analysis. We can also incorporate similar strategies for algorithmic trading.Our results show that changes in the public sentiment can affect the stock market. That means that we can indeed predict the stock market with high chances. There are many areas in which this work could be expanded in the future. Finding future trend for a stock is a crucial task because stock trends depend on number of factors. We assumed that news articles and stock price are related to each other. And, news may have capacity to fluctuate stock trend. So, we thoroughly studied this relationship and concluded that stock trend can be predicted using news articles and previous price history.In recent years, it has been noted that most people are investing in the stock market in order to make fast money. At the same time, an investor stands a good risk of losing all his or her money. As a result, for the consumer to understand future market trends, an effective predictive model is needed. There are several predictive models that tell whether the economy is going up or down, but they do not always produce reliable results. Our results show that changes in the public sentiment can affect the stock market. That means that we can indeed predict the stock market with high chances. There are many areas in which this work could be expanded in the future. Finding future trend for a stock is a crucial task because stock trends depend on number of factors. We assumed that news articles and stock price are related to each other. And, news may have capacity to fluctuate stock trend.We would like to extend this research by adding more company's data and check the prediction accuracy.

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