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Analysis of Stock Price Prediction Using ML Techniques

S. Sabarinath[1], R. Thirumalaivasan[2], S. Shiam[3], M S Mohamed Aashik[4], Prof. Mr. K. Sudhakar[5], Dr. P. Rama[6]
[1, 2, 3, 4, 5, 6]*Dept Of Computer Science Engineering Bharath Institute of Higher Education and Research, Chennai, Tamil Nādu, India*

Abstract: ***Time series forecasting has been widely used to determine the future prices of stock, and the analysis and modelling of finance time series importantly guide investors' decisions and trades. This work proposes an intelligent time series prediction system that uses sliding-window optimization for the purpose of predicting the stock prices using data science techniques. The system has a graphical user interface and functions as a stand-alone application. The proposed model is a promising predictive technique for highly non-linear time series, whose patterns are difficult to capture by traditional model.***
Keywords: Stock Market Prediction, Arima, Neural Network.

I. INTRODUCTION

Predicting stock price trend and its movement has been viewed as a standout amongst the most difficult utilizations of time arrangement expectation. Despite the fact that there has been numerous research which manage the issues of anticipating stock price trend, most exact discoveries are related with the developed financial markets. But it is difficult to predict the trend or price of the stock because of the uncertainty in the stock market. There are two types of analysis, Fundamental analysis and technical analysis. In fundamental analysis, performance of the company, economic factors and political factors are considered. In technical factors, previous n days closing price, highest price, lowest price etc. are considered. We can predict the trend of stock or price of the stock using technical analysis. Fundamental analysis is hard to measure and hard to implement in computer language. Technical analysis does not measure the intrinsic security value of the stock, but it uses technical stock charts to predict the trend of the stock.
In initial stage of the study of the stock market prediction, classical methods were used. But as stock market is a non-stationary time series of data. It was not so effective. So non-linear Data Science techniques like Artificial neural networks (ANN) and Support Vector Machine(SVM) are used widely. In this project we have used both the techniques to predict the trend of the stock and measured the accuracy of both the techniques.

II. LITERATURE SURVEY

A. Stock Price Prediction Using Combination Of Lstm Neural Networks, Arima And Sentiment Analysis

Financial markets being highly volatile, there is a huge amount of uncertainty and risk associated with them. This paper presents an innovative method to predict next day closing prices of stocks using combination of deep learning approach using Long Short-Term Memory (LSTM), architecture of Recurrent Neural Networks (RNN), Auto Regressive Integrated Moving Average (ARIMA) time series model and Sentiment analysis model to predict next day closing prices of stocks. These models have been combined in a Feedforward Neural Network to give the final prediction. This approach of combining different methods is called as Ensemble Learning, which in majority of cases gives higher accuracy than using individual models.

B. Stock Market Prediction Analysis

Stock market has been playing a vital role in financial market. Even a small commodity has some or the other effects due to change in stock market. One needs investors for the growth of the company who are attracted by the stock price or market value of the company. An ensemble model using the shown algorithms will be created i.e Linear Regression, SVR & LSTM. The algorithms are chosen as per how better they worked which is concluded from literature survey given forward.

C. Enhancement In Financial Time Series Prediction With Feature Extraction In Text Mining Techniques

News has been a very important supply for several monetary statistic predictions supported elementary analysis. However, digesting an enormous quantity of reports and information revealed on the net to predict a market will be heavy. Then, they were distinguished by a brand new differentiated coefficient theme to become options during a Support Vector Machine (SVM) to predict the trends.

D. Sentiment Analysis Of Twitter Data For Predicting Stock Market Movements

Predicting stock market movements is a well-known problem of interest. Now-a-days social media is perfectly representing the public sentiment and opinion about current events. Especially, twitter has attracted a lot of attention from researchers for studying the public sentiments. N-gram representation is known for its specificity to match the corpus of text being studied. In these techniques a full corpus of related text is parsed which are tweets in the present work.

E. Stock Market Prediction Using Ann

Stock market is a place where shares of public listed companies are traded. Stock exchange facilitates stock brokers to trade company stocks and other securities. India's premier stock exchanges are the Bombay Stock Exchange and National stock exchange. Neural network is used for prediction because they are able to run nonlinear mappings between input and outputs. It is possible that ANN outperforms traditional analysis like Linear Regression.

III. EXISTING SYSTEM

Time series forecasting consists of a research area designed to solve various problems, mainly in the financial area υ Support vector regression (SVR), a variant of the SVM, is typically used to solve nonlinear regression problems by constructing the input-output mapping function. υ The least squares support vector regression (LSSVR) algorithm is a further development of SVR and its use considerably reduces computational complexity and increases efficiency compared to standard SVR. υ The Firefly Algorithm (FA), which is a nature-inspired metaheuristic method, has recently performed extremely well in solving various optimization problems.

Disadvantages:

1) The existing system focuses on the stock price market in Taiwan, but does not generalize for other markets worldwide.
2) The system does not allow the import of raw data directly
3) The existing system cannot be used to analyze multi-variate time series
4) Lastly, the system does not have a user-interface which can be distributed as a web app to users for personal use.

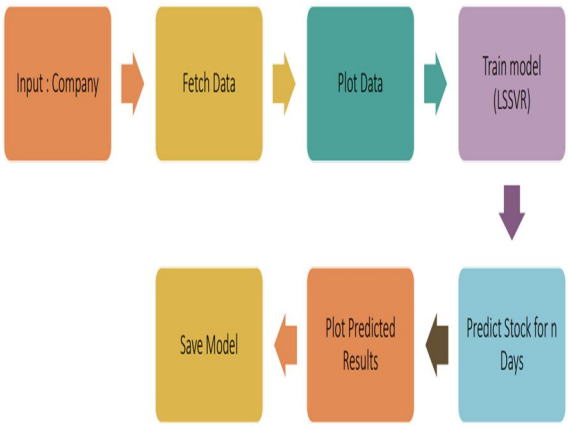
IV. PROPOSED SYSTEM

To generalize the application of the existing system, our work uses the system to estimate other stocks in similar emerging markets and mature markets The system can be extended to analyze multivariate time series data and import raw dataset directly Profit can be maximized even when the corporate stock market is has lower value The development of a web-based application has been considered to improve the user-friendliness and usability of the expert system.

Advantages:

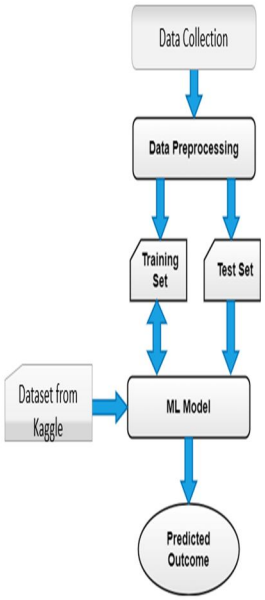
1) Here it is we are giving exact accuracy for that.
2) Its very proficiency compared with exiting system.
3) Easy to use.

V. SYSTEM ARCHITECTURE



VI. DATA FLOW DIAGRAM

1) The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.
2) The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that interacts with the system and the information flows in the system
3) DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.
4) DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.



VII. UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems. The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects-oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

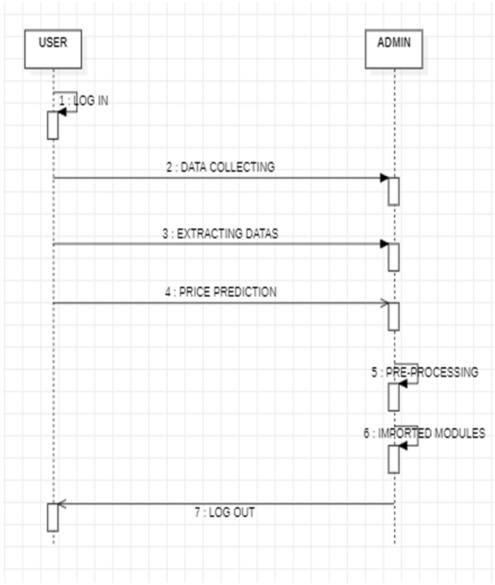
A. Goals

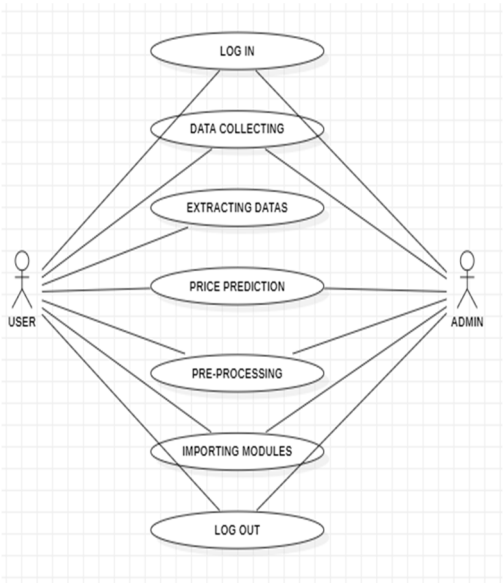
The Primary goals in the design of the UML are as follows:

1) Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2) Provide extendibility and specialization mechanisms to extend the core concepts.
3) Be independent of particular programming languages and development process.
4) Provide a formal basis for understanding the modeling language.
5) Encourage the growth of OO tools market.
6) Support higher level development concepts such as collaborations, frameworks, patterns and components.
7) Integrate best practices.

B. Use Case Diagram

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.





C. Sequence Diagram

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagram.

D. Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified

Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.

VIII. SYSTEM REQUIREMENTS

A. Hardware Requirements

System - Pentium-IV
Speed - 2.4GHZ
Hard disk - 40GB
Monitor - 15VGA color
RAM - 512MB

B. Software Requirements

Operating System - Windows XP
Coding language – Python

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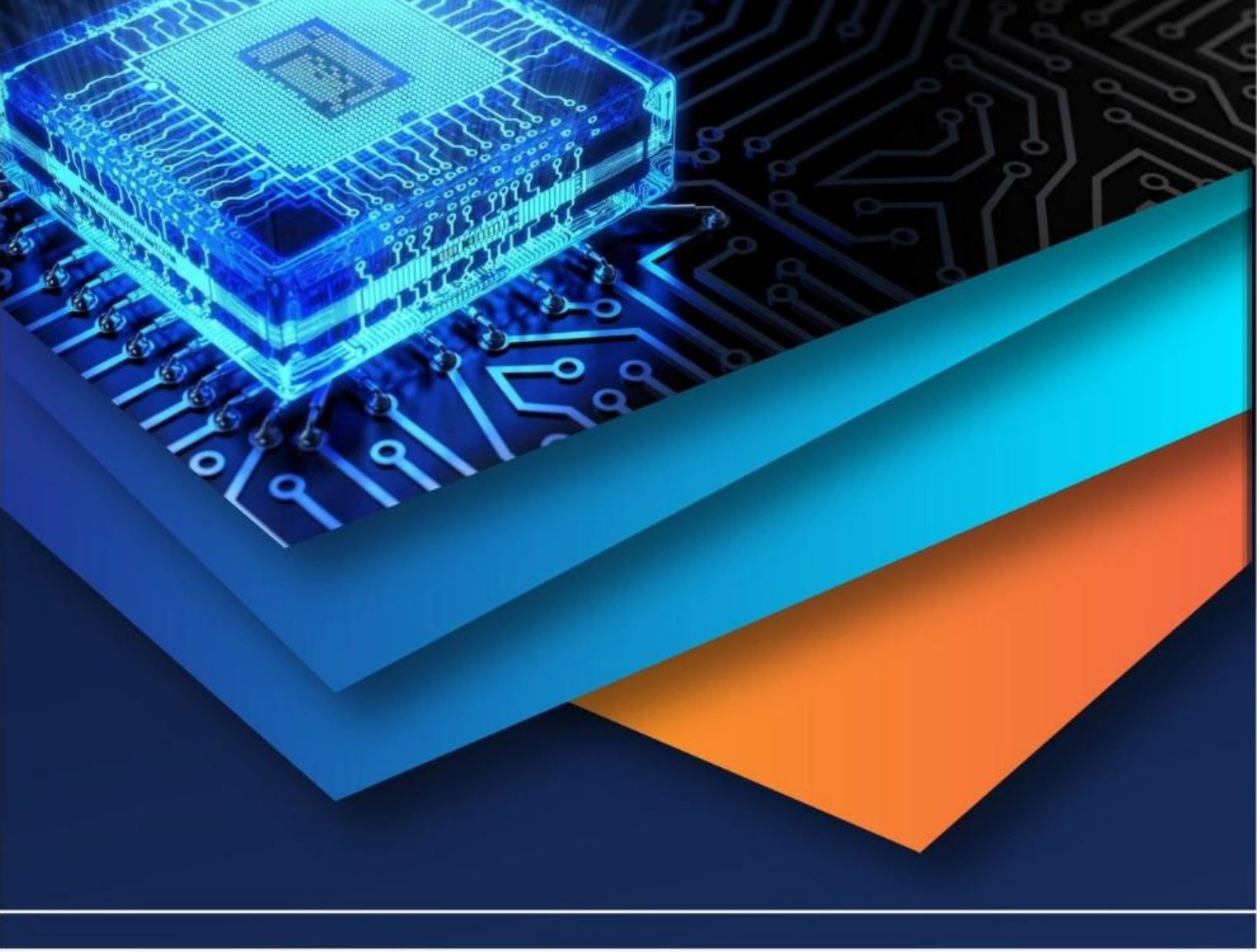

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