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"ALGORITHMIC TRADING USING MACHINE LEARNING TECHNIQUES"

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ABSTRACT: The primary goal of stock prediction in algorithmic trading is to predict the future value of the stocks for the clients. The machine learning techniques, predict the values based on the current value of stock market by training on their previous values, it is the most recent advancement in the stock market prediction technology. Machine learning itself makes use of several models to simplify and improve prediction.In this project, we are proposing not only a machine learning model to predict the future value of the financial stock of the company but we are also performing behavioral analysis of the customer to help him/her buy/sell the stock based on the market up/down to avoid future loss of the customer. For this, we are applying a machine learning model to check the behavioral analysis of customers by setting some threshold value which will help to automatic trigger to buy/sell of the stock of existing customers.

Keywords: Decision Tree, Naive Bayes, stock, behavioral analysis.

I. INTRODUCTION

The aim of algorithmic trading is forecasting the worth of a company's financial stocks for the future. In this paper, we will discuss about machine learning techniques that are used in predicting the commodity price and recommending stock modelling. Machine learning methods itself train many models to make prediction more accurate and simple. This model will build an application which will study the behavioral pattern of the customer of his investment and give the accurate suggestion to the customer for better investment.

In the stock market, where return and threat fluctuate rapidly, accurate price forecast of stocks is becoming more and more important. In addition, investors have always been enamoured with stocks due to their huge returns. Before investing in a stock, investors perform two types of stock analyses. The first type is called fundamental analysis; during this analysis, investors look at the stock's inherent value as well as the industry's production, political situation, economic situation, and other factors before deciding whether or not to invest. On the other hand, the specialized analysis tracks the development of stocks by examining the statistics produced by request activity, much like how prices and volumes did in the past.

In recent years, using machine learning algorithms developers has created many such prediction model that has promising results. In this paper, we'll discuss about an application that predicts financial data from datasets that contain all previous stock prices. These datasets will serve as the program's training sets. The prediction's main objective is to reduce the ambiguity involved in choosing an investing strategy. Dummy dataset predictions and

real-time predictions, which are utilised in stock market prediction systems, are the two methods available for stock prediction. Dummy datasets predictions and real-time predictions, which are utilized in stock market prediction systems, are the two methods available for stock prediction. While real-time prediction requires the use of the internet and observation of the current share price, dummy prediction requires us to define a set of principles and predict the future price by estimating the average price. As many people don't have much knowledge about the stock market investment this software will help them in predicting the right stock to purchase or sell and will also give notification about the correct timing to perform this activity. According to the stock market's governing random walk model, today's value serves as the best predictor of future value..

The aim for the anticipated stock market forecast may be the future stock price, price volatility, or market trend. As a result of advancements in computation, machine learning methodologies have been created for the financial markets' forecasting systems. This paper suggests, we are not only going to predict the stock but also will help the customers to suggest which stock to buy based on their choices using behavioral analysis.

II.RELATED WORK :

Milon Biswas,et al. Demonstrated the potential in prediction stock prices using LSTM, As shown in the research paper "Predicting Stock Market Price: A Logical Strategy using Deep Learning". Author uses the frequently used algorithm Long Short Term Memory (LSTM), Author Extreme Gradient Boosting(XG Boost),Linear Regression(LR), Moving Average, and forecasting stock price.

Jingyi shen,et al.Predicted the stock market prices as shown in the research paper "Short term stock market price trend prediction using a comprehensive deep learning system " presented the pre-processing of the stock market datasets, utilization of multiple feature engineering techniques, combined with a customized deep learning based system for stock market price trend prediction.

Chi-Hua Chen, conveyed the stock index forecast based on time series as show in the research paper "Research on Market Stock Index Prediction Based on Network Security and Deep Learning, Volume ". It is proposed to use CNN to extract in- depth emotional information to replace the basic features of the extraction level.

Somraju Dinesh, et al. Author demonstrated the prediction of a stock as shown in " Stock Price Prediction- 2021 ". The prediction of a stock using Machine literacy. The specialized and predicted or the time series analysis is used by the utmost of the stockbrokers while making the stock predictions. The programming language is used to prognosticate the stock request using machine literacy is Python. In this paper we propose a Machine literacy(ML) approach that will be trained from the available stocks data and gain intelligence and also uses the acquired knowledge for an accurate prediction. In this environment this study uses a machine learning fashion called Support Vector Machine (SVM) to prognosticate stock prices for the large and small capitalization and in the three different requests, employing prices with both diurnal and over- to the- nanosecond frequencies.

Maithili Patel, proposes the "Stock Price Prediction Using Machine Learning"as a different method for predicting stock market prices. In this work we use Machine learning architectures Long Short-Term Memory (LSTM), Convolutional Neural Network (CNN) and Hybrid approach of LSTM + CNN for the price forecasting of NSE listed companies and differentiating their performance. On a long term basis, sling window approach has been applied and the performance was assessed by using root mean square error.

CHAU Tsun Man, et al. Demonstrated different models for prognosticating the stock prices as shown in " Stock Price Prediction App using Machine Learning Models Optimized by elaboration " probe how different machine literacy ways can be used and will affect the delicacy of stock price predictions. Different models, from direct regression to thick and intermittent neural networks are tested. Different hyperactive parameters are also tuned for better performance.

Pawan Kumbhare, et al. predicted the stock prices using SVM as shown in " Stock Market Prediction " uses Support Vector Machine Algorithm(SVM). SVM is a veritably Specific type of learning algorithms characterized by the capacity control of the decision function, the use of the kernel functions and the failure of the result. In this paper, we probe the pungency of fiscal movement with SVM. To estimate the soothsaying capability of

SVM, we compare its performance with Decision trees. These styles are applied on 2 times of data recaptured from Yahoo Finance. The results will be used to dissect the stock prices and their prediction in depth in unborn exploration sweats.

III. PROPOSED SYSTEM:

In this work, we are proposing Stock Market Prediction with required set of data. The primary principle of the supervised learning model entails finding patterns and correlations in the data from the training set and then duplicating them in the test set. We also computed the accuracy using the predictions from the test set and the actual data. The suggested system addresses numerous study domains, such as feature selection and data pre-processing. By using Decision tree as a regression algorithm we are going to predict the stock for the customer and Naive Bayes will be used for the customers behavioral analysis like the customer is interested in which type of categories of stock such as finance, pharmacy, textile, etc., then even the quantity that how much to invest or sell.

IV. SYSTEM DESIGN:

The given figure below describes the system architecture of the model that we have discussed in the paper. It shows the flow of the model that is it's phases of execution. Firstly, the data is collected then the particular data sets are trained and tested using certain machine learning techniques to give better result to the customer. Here, we have used two modules for training and testing one is to predict the relevant stocks in the market and the other is to predict the behaviour of customers means which particular stock the customer is interested to invest in. It recommends the stocks as per customers preferences. Using machine learning techniques it becomes easier to predict and suggest the stocks according to current scenario.

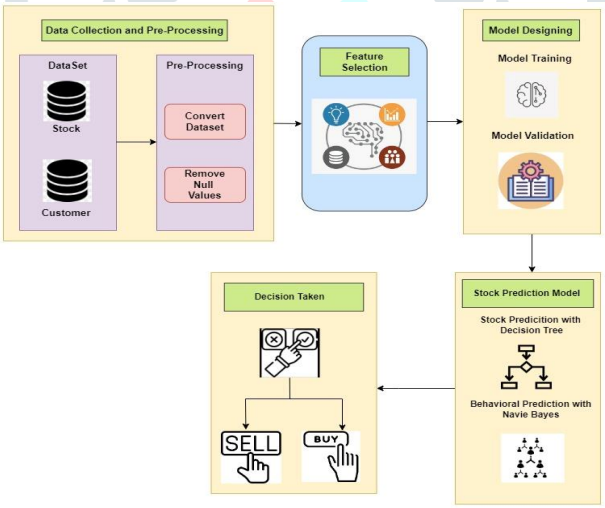

Fig 4.1 System Architecture

V. Algorithms:

1. Decision Tree:

An automatic machine learning tool that regresses the data using boolean expressions to specific questions is used to train decision trees, which are supervised machine learning algorithms. The result is thus represented graphically as a tree with three different sorts of nodes: root, internal, and leaf. The root node serves as the decision tree's first node and is followed by branches that lead to internal nodes and leaf nodes. In this graphic, the leaf nodes stand in for the final classification categories or actual values. Decision trees are practical and simple to understand.

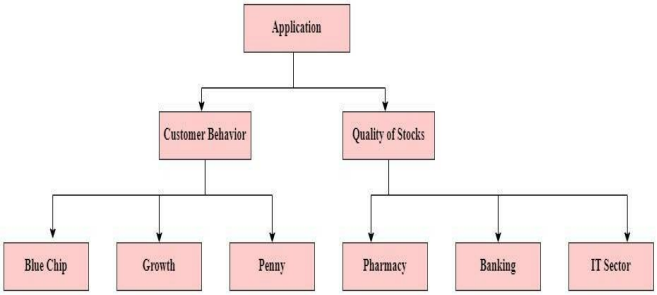

Fig 5.1 Working of Decision Tree

2. Naïve Bayes:

For classification problems, the probabilistic method known as Naive Bayes is commonly used. It is plain and simple to use, but it frequently works unexpectedly well. One example is the Naive Bayes-based spam filter in the Gmail app. The conditional dependence between the historical and prospective stock prices is provided. So that its occurrence probability is maximised, the stock price is chosen from the fixed value set of stock prices.

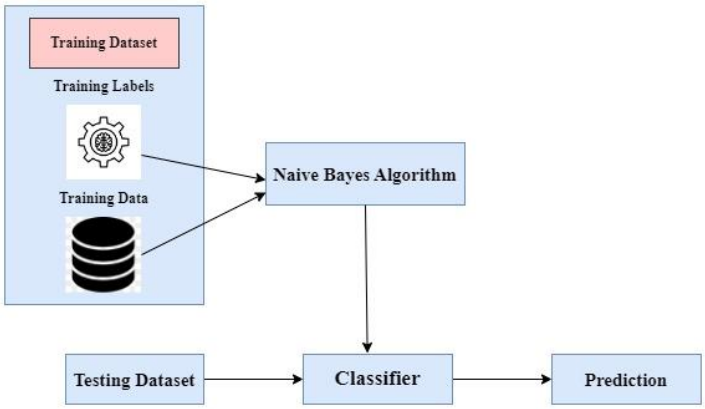

Fig 5.2 Working of Naïve Bayes

VI. CONCLUSION :

The purpose of this project is to improve the overall performance for buy and sell of stocks in the market and increase profit for the customer. Stock prediction and recommendation system using customer behavioral analysis provides a step towards choosing a right investment and huge profit margins. Stock Market Prediction & Behavioral analysis of Customer help to understand the best user choices and recommend the correct stock to the user and reduce the risk of manual trading and improve the profit to customer.

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