Stock Price Prediction Using Machine Learning

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***Abstract*—This project uses the machine learning techniques like Simple Linear Regression, Support Vector Regression, Decision Tree Regression, Random Forest Regression to predict the closed price of the stocks based on the open prices of stock recorded in the data set. Using that data as reference, the model estimates the future stock prices to help the user to invest the stocks efficiently. By visualization of actual and predicted process, the efficiency of model can be determined.This project give some insights on the machine learning approach to predict the stock price of the company.**

***Index Terms*—Regression,Simple Linear,Support Vector,Decision Tree,Random Forest**

I. INTRODUCTION

This paper explores into the stock market prediction,mainly concentrating on estimating future stocks prices for making decisions.This project aims on using historical data, to predict the variations of stock prices on daily basis. In this project we will use many algorithms like Simple Linear Regression,Support Vector Regression,Decision Tree Regression and Random Forest Regression to provide predictions. For each model there will be visualization between actual and predicted prices, therefore this model can take decisions in stock investments. By testing above machine learning regression algorithms ,we can predict risks and can able to make better decisions.Finally,we can improve how to reduce the risks and plan inverstments will be given in difficult financial situations.

II. LITERATURE SURVEY

[1] This research paper's explain's the deep research using machine learning and deep learning.Researches have searched Artificial Neural Networks(ANN) and Convolutional Neural Networks(CNN) with ANN facing difficulties of overfitting. The CNN method gives output of grayscale 2-D histograms ,giving accuracy by reducing training time and data needs. But both methods exhibit accuracy in stock market prediction.

[2] This research paper's review of literature focus on limitations of using machine learning and deep learning algorithms. This paper discusses how to face challenges like handling errors or complexities in stock data.It also handles missed data handling including optimization techniques.The review gives the MLS LSTM model within the research.

[3] This paper explores into the stock price prediction using machine learning and deep learning algorithms checking the challange of nonlinearity. It shows the up-down minor stock price fluctuations and it proposes the NPMM-N period Min-Max labelling method.It develops atrading system using XGBoost and finds its performance against the other labelling methods.It describes the importance of instance selection and suggest future research directions.

[4] This paper explores 32 research works from the year 2011 tp 2022 based on the feature selection and the extraction techniques in stock market prediction, finding correlation criteria RF,PCA and AE as the key methods.RF and SVM are the primary Machine learning approches.The study explains the significance of feature analysis in improving accuracy prediction and utilize reduction techniques to enhance the performance of learning models for stock market predictions.

[5] This research paper's review of literature addresses the critical issue of deadlock avoidance in cloud computing, proposing an algorithm that enhances resource allocation efficiency by considering execution time attributes of processes. The existing algorithm focuses on load balancing, while the improved algorithm introduces a Temporary Queue and prioritizes shorter execution times for faster resource availability. The study emphasizes the importance of response time in cloud computing and suggests future work involving additional process attributes like request importance and exploring parallel processing capabilities when resources permit.

[6] This study conducts a reviews on Extreme value theory(EVT) in predicting investment risk of covid-19 pandemic.It reveals research in the domain mainly in multivariate cases and gives the complexities of such analysis.Further research will be done to develop conceptual models sensitive to fluctuations.We use EVT and machine learning algorithms to get good accuracy.

[7]In this paper, analysis of stock chart through Machine learning and Deep learning model have been discussed which mainly focuses on finding the hidden patterns. The speciifying parameters affect stock exchange movements and effect on the stock value volataility.The study tells that a vital role played by the means of the data mining being used in selection of stable stocks for the investors.It also proposes the scope of further research and improvements.

[8] This paper explores the impact of different factors in market trends.It explains the application of statistical techniques based on analysis of customer reviews.The paper includes the challenges such as lower classification accuracy and explains the exsisting problems in stock market prediction.

[9] This paper introduces a good approach by combining

ML algorithms for stock prediction and mean VaR model for portofolio selection.Random Forest,XGBoost,AdaBoost ,SVR,KNN and ANN are used to predict stock values. It uses monthly datasets from the Bombay Stock Exchange(BSE), Tokyo Stock Exchange(TSE) to know the techeniques's effectiveness. By using these regression models it produces performance compared to other models,offering important predictions for portopfolio strategies.

[10]This paper focuses on the uses of natural language models such as ChatGPT in finding the returns of stock market with the help of news headlines.The findings focuses on the positive connections between ChatGPT scores and the following daily stock returns which exceeds the performance of the conventional sentiment analysis. The experiment shows the better capability of complex language models like ChatGPT-4 predicting compared to basic models like GPT-1,GPT-2,and BERT.

III. METHODOLOGY

The methodology for the this project :

1) Data Loading and Exploration :
   - Loads the dataset from 'ICICI-BANK.csv file.'
   - Displays information like shape,columns and data types.
2) Data Cleaning :
   - Drops the unimportant columns to focus on 'Date','Open' and 'Close' columns.
3) Data Vizualization:
   - It displays Histogram and scatter plot to visualize the distribution of 'Open' and 'Close' prices.
   - Uses Seaborn and matplotlib
4) Model building,prediction and evaluations :
   - Split the dataset into training and testing sets.
   - Caluclate the accuracy of each model using r2-score.
5) Identifying the best model :
   - Identifies the model with highest accuracy.
   - Predicts the closing price for company.
   - Import neccessary libraries like Pandas,Numpy,Matplotlib and seaborn.
   - cleaning the data by removing columns.
   - Using the best model to predict closing price for data

IV. RESULT

CONCLUSION

In conclusion, this project approaches at different ways to predict trends using machine learning.We want to understand how to use techniques to predict risks and make decisions on investment.Ultimately we wil learn how to manage risks in difficult situations.

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