



## NIFTY 50 STOCKS PRICE PREDICTION APP

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**Abstract:** Stock price prediction is a critical area of research and application in financial markets. This project employs Facebook's Prophet, a robust time series forecasting tool, to predict future stocks prices. The aim is to build a predictive model capable of analyzing historical stocks data and forecasting future trends. The project begins with the collection of historical stocks price data from reliable sources. After preprocessing and feature engineering, the data is structured into the required format for analysis. The Prophet model is then trained using this prepared dataset, learning patterns and trends in the stock's prices. The study's implementation is executed through an interactive web application developed using Streamlit. This application allows users to input stocks preferences, select date ranges, and receive real-time stocks price predictions based on the trained Prophet model. Users can visualize historical and predicted stocks prices, enabling them to make informed decisions. The project contributes to the field of stocks market prediction by demonstrating the application of Prophet in a user-friendly and accessible manner for traders and investors seeking valuable insights into future stocks price trends.

**IndexTerms** - Nifty 50 Stocks Price Prediction, Data Science, Machine Learning, Streamlit, Stocks Market, Yahoo Finance, Prophet.

### I. INTRODUCTION

In later times, stocks that publish assumptions are getting more thought, potentially because of the truth that if the nature of the feature is really expected, the examiners might be predominantly directed. The advantages gained by contributing and trading inside the stocks feature massively depend on the consistency. On the off chance that there's a structure that can dependably expect the heading of the enthusiastic stocks to be revealed, it will empower the clients of the system to frame instructed decisions.

Moreover, the expected examples of the promote will help the regulators of the grandstand go to healing lengths. Blueprint of the money related market's stream and the meaning of accurate stocks' cost assumptions in adventure decision-making. [2]

The expansion report on the estimate of stock costs using Facebook Prophet serves as a comprehensive guide that details the application, analysis, and outcomes of utilizing the Prophet to determine stock costs. The study discusses a number of topics, methods, and disclosures pertaining to the use of Prophet to forecast stock promotion tendencies. Demonstrate the project while outlining the goals, rationale, and significance of utilizing Facebook Prophet to forecast stock prices. Demonstrate the effort, goals, and importance of using Facebook Prophet to estimate stock prices.[3]

As per [5], clarification of the methodology embraced inside the expand, counting data assortment, preprocessing, exhibit decision, and assessment. In case there's a structure that can dependably expect the heading of the fiery stocks exhibit to engage the clients of the system to make taught decisions, more than the expected examples of the exhibit will help the regulators of the promote going to medicinal lengths. Present the test of anticipating stocks costs in monetary business sectors, underscoring its intricacy and importance in choices. Look at the whim of stock grandstand designs, the closeness of noise in monetary data, and the limitations of traditional deciding strategies.

As indicated by [6], address the expectation for a reliable, exact, and flexible perceptive show equipped with catching vivacious promote conduct. Discuss the deficiencies of routine deciding models in watching out for the perplexing idea of stocks exhibit information. Address issues connected with managing consistency, events, and unexpected changes in patterns. Direct backslide might be a way to deal with displaying the connection between a scalar response (or subordinate variable) and at least one illustrative factor (or free factor). An instance of one useful variable is called fundamental straight relapse.

### 1.1 Introduction to Machine Learning:

AI (ML) is a field of logical request zeroed in on the improvement of calculations and factual models used by PC frameworks to execute explicit errands without express programming directions. The essential objective of AI is to empower frameworks to learn and further develop their presentation in view of information inputs. The accent is on improving machine independence and effectiveness in errands by utilizing the inborn examples and experiences inside broad information archives. Various investigations have dug into enabling machines to learn independently, without the requirement for unequivocal programming. Mathematicians and software engineers utilize different ways to deal with this test, especially while managing huge datasets. [1][8][5]

## II. METHODOLOGY

**Data Collection:** Utilize the Yahoo Finance API to collect historical stocks price data for the desired stocks(s). Extract relevant features such as date, opening price, closing price, volume, etc.

**Model Training:** Use Facebook Prophet, an open-source forecasting tool, to train a predictive model on the historical stocks price data. Prophet is capable of handling seasonality, trends, and holidays in the data, making it suitable for stocks price prediction.

**Prediction:** Utilizing the Prophet model that has been trained, forecast stock prices for the future. Forecast the stocks prices for a specified period into the future.

**Visualization:** Use Streamlit, a Python library for building interactive web applications, to create a user-friendly interface. Visualize the historical stocks price data, model predictions, and performance metrics using interactive charts, graphs, and tables. Permit users to alter inputs like the forecast horizon, stocks symbol, etc.

**Deployment:** Deploy the Streamlit application on a web server or cloud platform for accessibility. Ensure proper scalability, security, and performance of the deployed application.

## III. PROPOSED SYSTEM

The system comprises a Streamlit-based web application integrated with SQLite for user registration, verification, and login. Users input their details via a Streamlit form, with validation ensuring data integrity. Verification is done via email, confirms user identity before storing credentials securely. A Streamlit login interface validates user input against the SQLite database, granting access upon successful authentication. Security measures include password hashing and protection against common vulnerabilities.

As discuss getting the historical data from the market is mandatory step. Then there is a need to exact the feature which is required for data analysis. Then train the data, training the algorithm to predict the price and the final step is visualize the data. A software process model is an intellectual representation of a process. It offers an explanation of the procedure.

Process models may contain activities that are a component of the software process. Communication, planning, modeling, construction, and deployment are the five general framework tasks. The basis for all models of software processes. Every action has a certain objective. The purpose of the process model is to provide recommendations for methodically organizing and monitoring the tasks that need to be finished in order to meet the project's goal and its outcome.

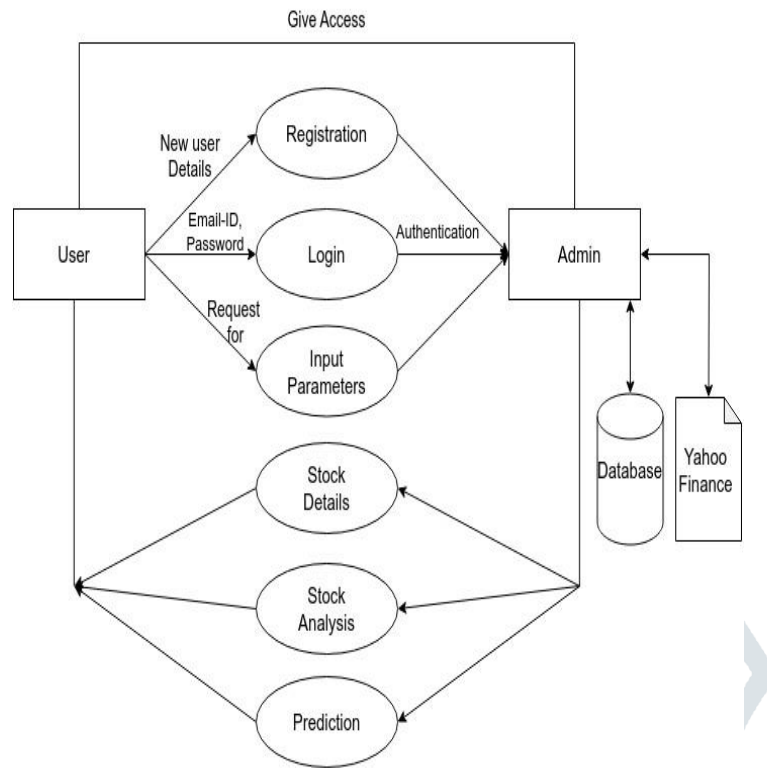


Fig1: System Architecture

**IV. PARAMETERS USED**

List of parameters used in prediction algorithm.

Parameter Used	Meaning
Date	Date of stock price
Close	Closing price of the share

Table 1: Parameters Used

**V. ALGORITHM USED**

**5.1 Prophet Algorithm:** The Prophet algorithm is a forecasting technique developed by Facebook's Core Data Science team. It's designed to make accurate predictions on time-series data that exhibit trends and seasonal patterns. Prophet decomposes time-series data into three main components: trend, seasonality, and holidays/effects.

Trend: Prophet fits time-series data with a piecewise linear or logistic curve that captures overall directionality.

Seasonality: It models periodic fluctuations in the data, such as daily, weekly, or yearly patterns.

Holidays/Effects: Prophet allows users to include custom events or holidays that may impact the time-series data.

Prophet is a method for predicting time series data using an additive model. It fits non-linear trends with seasonality on a daily, weekly, and annual basis, together with the effects of holidays. Strong seasonal effects in time series and multiple seasons of historical data are ideal for its effectiveness. Prophet usually handles outliers well and is resilient to missing data and trend changes. Prophet is a potent time series forecasting tool that is frequently used in academic and professional contexts because of its ease of use, adaptability, and capacity to generate precise forecasts with little effort.

**5.2 Stock Price Prediction Using Prophet Algorithm:** Using the Prophet algorithm for stock price prediction involves collecting historical stock price data, preprocessing it for compatibility with Prophet's requirements, and training the algorithm on this data. Once trained, the Prophet model can forecast future stock prices by identifying trends, seasonality, and holiday effects in the data. These forecasts can be evaluated for accuracy using various metrics and visualized to understand the model's performance. It's important to note that while Prophet can provide valuable insights into stock price trends, it's just one tool among many for making investment decisions, and external factors should also be considered. Additionally, model refinement and iteration may be necessary to improve forecast accuracy over time.

## VI. RESULTS AND DISCUSSION

The implementation of proposed PROPHET model using machine learning which predicts the future price of ICICI Bank Limited share based on its historical data. In our paper the implementation of an algorithm which predicts the stock price of a share for given period of time.

The chosen stock's information is displayed in Figure 2, along with the company name, market capitalization, net profit in crore, dividend yield in percentage, and current market price in rupees.

	Value
Company Name	ICICI Bank Limited
Current Market Price	1104.40
Market Cap (Cr)	775540.65
Net Profit (Cr)	42437.55
Dividend Yield (%)	0.72

Fig.2 Details of Company (ICICI Bank Limited)

Fig. 3 shows the historical data from 2019 to till date. In the graph there are two lines, where red line shows the stock's open price and blue line shows the stock's closing price.

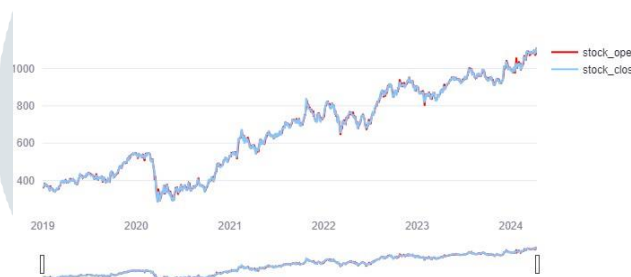


Fig.3: Time Series Data.

The approach we employed in our project to determine when to purchase and sell a specific stock is depicted in Fig. 4. The graph's red line represents the closing price of the stock, the faint blue line represents the 200-day moving average, and the dark blue line represents the 50-day moving average. The method under evaluation is as follows: if the dark blue line crosses the faint blue line from the bottom, you can purchase that specific stock; if it crosses the faint blue line from the top, you can sell that specific stock.

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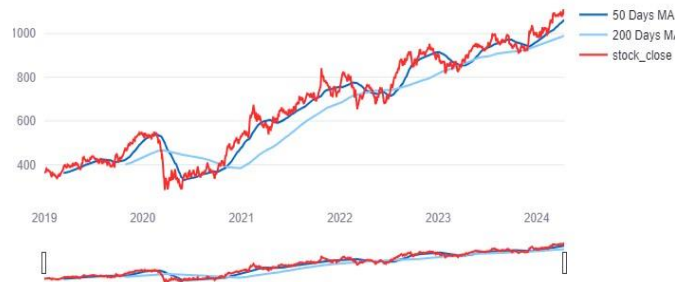


Fig.4 MA Crossover Strategy.

Fig. 5 indicates whether to buy or sell the stock. It gives a signal based on selected number of months which indicates whether to buy or sell a stock and also it gives how much percentage of returns can be possible. The website itself displays this description.



Fig.5 Prediction Signal

Figure 6, which was created using the original dataset, displays the outcome as well as the closing price for a particular stock indicated by black dotted lines, the prediction indicated by a dark blue line, and the range indicated by a faint blue region up to which our prediction can go.

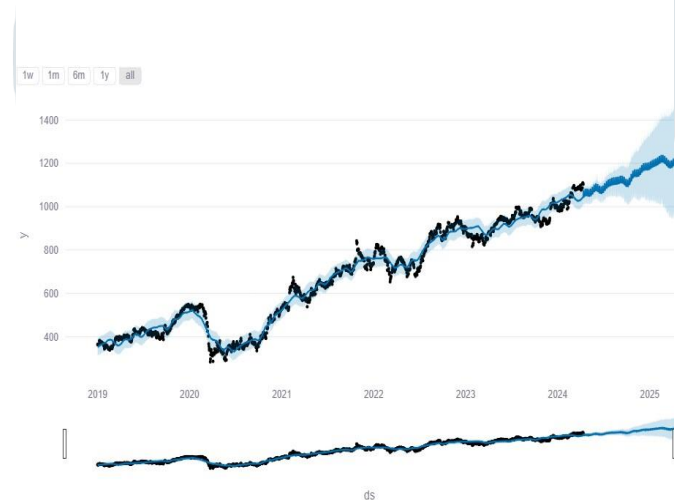


Fig.6 Prediction Graph

## VII. CONCLUSION

Stocks advance longing may be an intricate zone to ace since it consolidates learning and down to soil utilizations of various contraptions, outlines, and markers, as well as investigating the basics of an organization so likewise well. Be that since it might, the harder it is to genius this idea, the more valuable the ideas that come about are. Not one, not two, there are various inclinations associated with stocks market want, and they are unendingly and on the grounds that it is planned to assist you with causing benefits on your speculations in the event that you get things right. The stocks advertise gauge has extra focal concentrations for novice vendors as they are the sort of sellers who are more skewed to making bungles and going toward authentic difficulties inside the notification contrasted with experienced shippers. You will be assessed and foresee the stocks pitch by getting an amount to comprehension of the equivalent. For this, you will show off stocks through different inducements and advance your methods for contributing. Stocks Caused Significant Damage Want is the errand of concluding future stocks costs in light of genuine information and unmistakable show markers. It consolidates using honest models and AI computations to examine cash related information and make wants almost in the long run of a stock.



### VIII. ACKNOWLEDGMENT

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