HISTORICAL ANALYSIS AND FORECASTING OF STOCK MARKET USING FBPROPHET

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Abstract
Forecasting can be used in many fields such as crypto currency prediction, financial entities, supermarkets etc. We get the time series date which we use to feed the data into the algorithm is given by Y finance with this we get refreshed data every day. The stock market prediction or forecasting helps customers and brokers get a brief view of how the market behaves for the coming years. Many models are currently in use Like Regression techniques, Long Short-Term Memory algorithm etc. FB Prophet is proven to perform better than most other Algorithms with better accuracy. From the proposed research and references we have determined Facebook's Prophet algorithm as our forecasting algorithm because it is predicting at better accuracy, low error rate, handles messy data, doesn't bother for null values and better fitting.

1. INTRODUCTION

The technique of predicting the future value of a company's shares of an exchange is known as stock market prediction. Our project aims at forecasting the future of the stock market on a specified day or over the period of time. This project will help the stock market enthusiasts to help predict the stock price and hence helping those people in getting profits. Inorder to do all the, operations we need an algorithm that could help us in doing all the analysis. We have to choose an algorithm that could be flexibleto holidays and thus, helping us in analysing seasonal data of a stock. Hence, we chose FB Prophet as our algorithm as it can be flexible to messydata and can also handle null values very well. The major goal of our projectis to predict the future value of the financial stocks of a company. The project aim is to help the users get correct prediction of stock and helps himbetter understanding of the stock market and leads him to huge profits.

The dataset we use here is from Y finance which provides historical data of a stock company since its inception. Data from our dataset gets refreshed every day. The ultimate goal of the proposed project was to Forecast the future value of the financial stocks of a company with respectto date. We make use of Machine learning to forecast in a better way. Thereare many algorithms provided but we felt FB Prophet will do the job better.It is being used in some of the applications in Facebook. Also, we are using

a web framework for python called stream lit through which we can deploy our project in public medium so that anyone with an URL can view our project which we hosted in our GitHub.

2. OBJECTIVE

The major goal of our project is to project the company's share value of the future. The project aim is to help the users get a correct prediction of stock and helps him better understanding of the stock market and leads him huge profits.

Our project aims at forecasting the future of the stock market on a specified day or over the period of time. This project will help the stock market enthusiasts to help predict the stock price and hence helping those people in getting profits. In order to do all the, operations we need an algorithm that could help us in doing all the analysis.

3. EXISTING SYSTEM

There are many existing stock market forecasting applications available but all of those are for either investors or to make money via advertising revenues. Some of the disadvantages of existing systems are poor user interface, low level of accuracy, too many ads, asking for personal information to use their services, etc.

4. PROPOSED SYSTEM

- Using Y Finance module, the historical stock market data is collected.
- The obtained data is then trained in the FB Prophet algorithm.
- Using the FB Prophet algorithm, we forecast the stock market of the future.
- An interactive and User-friendly dashboard is then created.
- Then the project is Cloud enabled using Heroku cloud and hosted using GitHub and then using an URL the application can be accessed anywhere.

5. LITERATURE SURVEY

- **'Time series forecasting model for supermarket sales using fbprophet'** by Shilpa pande, Bineet kumar jha in 2021 their paper aims in implementing the Facebook's Prophet algorithm, conducting an analysis of sales related to supermarket with provided data. fitting the obtained data into the ARIMA model for analysis.

- **'Stock Price Forecasting Using Data from Yahoo Finance and Analyzing Seasonal and Nonseasonal Trend'** by Jai Jagwani, Manav Gupta in 2018. This paper offers a bigger picture of share value projection by merging the outputs of multiple analysis models in an attempt to implement a range of share value prices for brokers such that no losses are incurred.

- **'Applications of Facebook's prophet algorithm for successful sales forecasting based on real-world data'** by Kemal Korjenic, Emirzunic in 2020. This journal provides a system for reliably projecting future retail sales and classifying product offering according to predicting accuracy standards in the retail industry.

- **'Time Series Model for Stock Market Prediction Utilizing Prophet'** by Neha Gupta, Dr. Lilly Sheeba S in 2021. This journal tries to highlight the importance of timing in enhancing forecasting

accuracy,which is accomplished with the use of prophet algorithm. This journal uses fbprophet library to define 3 different hyper parameters namely seasonality, trend, and holidays.

- **'Stock price forecasting using information from Yahoo Finance and google trend'** by Selene Yue Xu in 2014. This publication aims toanticipate periodic fluctuations in share price using a combination of traditional series data analysis and data out from Yahoo.

6. IMPLEMENTATION

6.1 DATA COLLECTION

To develop a better framework for our model to forecast and predict stock values we have explored many kinds of datasets in google and Kaggle. Eventually we came to a conclusion that YFINANCE will give better datawhich gets refreshed every day. The data is well structured and contains every detail about a company. Our dataset contains lots of columns which are very commonly used terms for stock market analysts and enthusiasts.

Date - Historic date of every stock traded day

Open - The starting period of trading on a securities exchange ororganized over-the-counter market.

High - The highest price at which a stock traded during the course ofthe trading day.

Low - Minimum price of a stock in a period.

**Close** - The price of the last traded stock at the end of the day.

Volume - The number of shares traded in a stock or contracts traded infutures or options.

Dividends - The distribution of some of a company's earnings to a class of its shareholders, as determined by the company's board of directors.

Stock splits - A stock split is when a company's board of director issuesmore shares of stock to its current shareholders without diluting the value of their stakes.

6.2 ARCHITECTURE

Our project could project stock market data of the future more accurately when compared to all other forecasting algorithms such as ANN,ARIMA etc. This would be really helpful for those who are willing to invest in stocks and for the brokers too. Y finance is a module in python, which provides daily market data using an API from Yahoo. We propose a basic flow of our project methodology with a small block diagram shown below.

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Data Flow Diagram
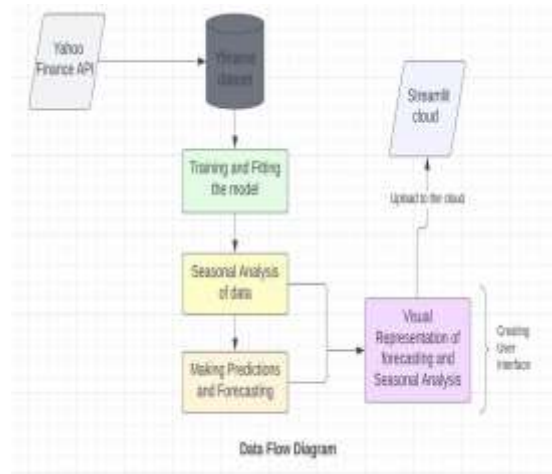
6.2.1 Creating Our Forecasting Model

There are many forecasting models available in the market like LSTM, Regression models, ANN etc., But the newly introduced FB Prophet shows better results compared to all the other algorithms. FB Prophet is a powerful tool being used by Facebook even in its many forecasting applications. It has also been noted that this algorithm in most of the cases. Also, some of the main reasons for applying this model are this algorithm can handle messy data, can work if data contains lot of null values also provides special feature to exclude holidays. The algorithm makes use of Pystan which is a state of art tool for statistical analysis usingprobabilistic algorithms.

6.2.2 User Interface

Now, we need to implement a User Interface to deploy our application into web. Stream lit is an opensource framework in python thatprovides users to create and share their applications in the web. It is one themost used frameworks for data science. Using this frame work we can easily deploy our application in the public domain and host it in any cloudmediums or can be run using GitHub.

6.2.3 Creating Interactive plots

We try to implement the data we get from Y finance in several plots and graphs. The users prefer data representation in graphs and plots rather thanverbal representation. So, we try to develop an interactive visualization dashboard designed to show the seasonal trends and forecasting of the stocks of the future. We are making use of several packages such as Plolty and some methods that are provided by the FB Prophet. Python allows dynamic and interactive graphs. Using those graphs, we could get extra information while we hover over the graph and can easily view detailed behaviour by zooming in and out. These interactive plots can be used to represent various important features of a stock industry such as open, close,high, low, dividends etc. We implement dates on the x-axis and values on the y-axis.

6.2.4 Forecasting and Seasonal Data Analysis

Using FB prophet we try to predict the data for the coming years. We train the FB Prophet model using the Historical data we get from Y finance and then predict the data of the future dates. This algorithm provides results with better accuracy. Also, the algorithm works best with time series data and provides various techniques like excluding holidays and weekly, monthly, daily, yearly analysis. the algorithm also provides methods to display plots for those seasonal analysis.

6.2.5 Project Deployment

After the model has been completed successfully and user interface has been created then we will our application cloud enabled and host using GitHub. Finally, we deploy our project in stream lit after that stream litprovides a link with which anyone can view our project. Also, our application can be shared to anyone using emails so that they can use our applications. Currently, our application is in public domain we can also make our application for private use.

7. CONCLUSION

We believe our project clearly aims at projecting the share value of acompany of the future. Therefore, we are aiming to implement a web-based data science application using streamlit, framework, and we try to enable our applicationin cloud we will host our application in github, so that anyone from anywhere can access our application using an URL.

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