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# STOCK MARKET PREDICTION SYSTEM

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**Abstract -** *Technical analysis is a trading discipline utilized to gauge investments and establish trading opportunities by analyzing applied mathematics trends gathered from trading activity, like value movement and volume. The proposed system analyzes stock market's past performance within different time periods and generates likely future movements by using Machine Learning algorithms. The model collects various financial data from media websites and analyses patterns based on predefined parameters. Using the analyzed data, the accuracy of patterns found are determined and then applied based on reliability. The objective is to design an intelligent analytical system that uses live data, analyses them using a designed model and generates predictions based on the information analyzed by the model.*

## 1. INTRODUCTION

In finance, technical analysis is an analysis methodology for prediction the direction of price movement from the study of former market data, mostly price and volume. The concept of technical analysis is derived from many years of capital market data. Analysts use charts to hunt for intrinsic value chart patterns, like the famous head and shoulders or double top/bottom reversal patterns, study technical indicators, moving averages, and appearance for forms like lines of support, resistance, etc. Technical analysts additionally wide use market indicators of the many types, a number of that is mathematical transformations of value, usually as well as up and down volume, advance/decline information and alternative inputs. These indicators are built to facilitate analysis whether or not a stock is trending, and if it's, the prediction of its direction and of continuation. Analysts additionally seek relationships between price and volume indices and market indicators. Machine learning is concerning digesting massive amounts (of information of knowledge of information) and learning from that data in a way to perform a particular task. It excels at handling massive and complicated volumes of knowledge, one thing the finance trade has in way over. A mathematical model monitors the news and trade leads to period of time and detects patterns which will force stock costs to travel up or down. It will then act proactively to sell, hold, or purchase stocks in line with its predictions. Machine learning algorithms will analyze thousands of knowledge sources at the same time, one thing that human traders cannot probably come through.

## 2. LITERATURE SURVEY

A research paper published [1], explores the technical indicators that provide the most successful prediction when they are used together in learning algorithms. They also investigate the technical indicators that lead to the most successful price movement direction prediction.

Another paper [2], explores the importance of news data and time series descriptors derived from technical analysis for prediction in trend reversal.

This paper [3], explore research direction to exploit market technical indicators together with market sentiments extracted from social media for predicting market directional movements. Their proposed model can solve the issue of skewed classes through the use of appropriate data balancing techniques.

## 3. DETAILED WORKING /DESIGN

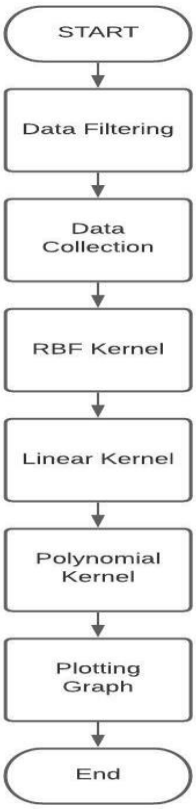


**Fig.1-** Architecture of system

### 3.1 Data collection

For the purpose of collecting the data we will perform our analysis on, we have used the Yahoo! Finance platform. Yahoo! Finance is a subsidiary of the Yahoo! network, which was bought by Verizon Media. It offers share market data, press information, financial reports, and much more. Its website provides the historical data required by us in CSV (Comma-separated values) format, under the 'Historical Data' section of any listed company page.

### 3.2 Data preprocessing

The platform we have used, Yahoo! Finance provides useful features for our ease of navigating through the vast amount of data. Using such filters, we narrow down our data by the latest month and use the download option to collect our data, from where we then shift its local location to the internal folder of our work environment.

### 3.3 Machine Learning Algorithms

In machine learning, support-vector machines (SVM) models are learning algorithms that analyze data for classification and statistical purposes. Made by Vladimir Vapnik, SVMs square measure one among the foremost durable prediction methods, being supported applied math learning frameworks or VC theory.

It's one amongst the favored Machine Learning models which will be utilized in classification issues or distribution categories once the info isn't linearly divisible.

In machine learning, the radial basis perform kernel, or RBF kernel, may be a common kernel perform utilized in numerous kernelized learning algorithms. above all, it's usually utilized in support vector machine classification.

The RBF kernel on 2 samples x and x', delineated as feature vectors in some input house, is outlined as

$$K(\mathbf{x}, \mathbf{x}') = \exp\left(-\frac{\|\mathbf{x} - \mathbf{x}'\|^2}{2\sigma^2}\right)$$

Linear Kernel is employed once the information is Linearly divisible, that is, it is often separated employing a single Line. it's one among the foremost common kernels to be used. it's largely used once their area unit an oversized variety of options in an exceedingly explicit information Set. In machine learning, the polynomial kernel can be a kernel operating typically used with the support vector machines and completely different kernelized models, that represent the similarity of vectors throughout a feature house over polynomials of the primary variables, allowing learning of non-linear models.

Intuitively, the polynomial kernel appearance not solely at the given options of input samples to see their similarity, however conjointly combos of those. within the context of multivariate analysis, such combos square measure called interaction options. The feature house of a polynomial kernel is reminiscent of that of polynomial regression, however while not the combinatorial blowup within the range of parameters to be learned.

For polynomial kernel, the formula is

$$K(x, y) = (x^\mathsf{T} y + c)^d$$

## 4. RESULTS

The chart below is the outcome of our predictions in a graphical format

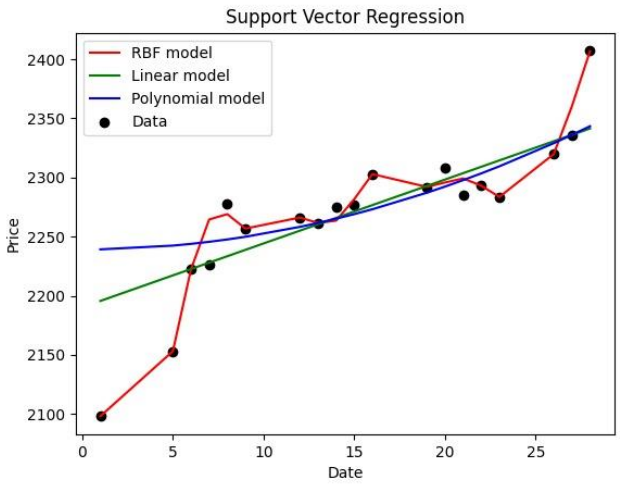


**Fig.2**-Plotted Graphical Prediction

The data represented above is for Google (Alphabet Inc.) for the month of April 2021.

Our Prediction for 29th of April is as below.

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The stock open price for 29th April is:
RBF kernel: $ 2435.945117784363
Linear kernel: $ 2346.9095238097398
Polynomial kernel: $ 2351.0060058540594
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**Fig.3**-Predicted Price

Below image shows the actual prices for that day.

| Date | Open | High | Low | Close* | Adj Close** | Volume |
|---|---|---|---|---|---|---|
| Apr 29, 2021 | 2,410.33 | 2,436.52 | 2,402.28 | 2,429.89 | 2,429.89 | 1,977,700 |

**Fig.4**-Actual Price

## 5. CONCLUSIONS

Through this project we have learn the applications of various Machine Learning Algorithms. Technical analysis and its management are difficult manually. Hence, this prediction system will help in a better and efficient predictions system for stocks for investing wisely and minimize the research time required by the investor before investing.

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