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Indian Stock Markets Data Analysis and Prediction using Machine Learning

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Abstract: ***A machine learning library helps a computer to predict future results and trends with the use of available data. It uses past data at different times to predict the future prices of the stock. As the amount of money traded every day is billions in the stock market world, it has always been a goal or challenge for investors to predict the stock more accurately. Research will provide stock prediction for future results, whether the stock is closed or short. It will give an indication, based on previous data or historical data that it is to be provided. To demonstrate the methodology, sixteen stock indicators have been applied to the stock data of the last nineteen years of the Nifty-50 with the help of machine learning libraries such as Numpy, Pandas, Matelpotlib, Skleren, etc. We use the diff indicators to analysis the data.***
Keywords: Nifty-50, Stock, ML, UP/DOWN, ANN, RF.

I. INTRODUCTION

It's always been a challenge to predict the stock market because of stock uncertainties, so there are so many techniques available or still under progress to predict the stocks in the world of stock market. Earlier many classical methods were used for the prediction, but nowadays machine learning techniques are in trend. We use the two diff methods of the ML (ANN and RF) to predict the data and used Diff Macroeconomics Indicators to predict the data. Diff machine learning techniques are as follow

A. ANN (Artificial Neural Network)

ANN model consist of neurons, it is a network of neurons which basically surpass the functionality of our brain. It has three layers: input layer, hidden layer, output layer. It works like humane brain works. ANN working Shown in the fig 1.1.

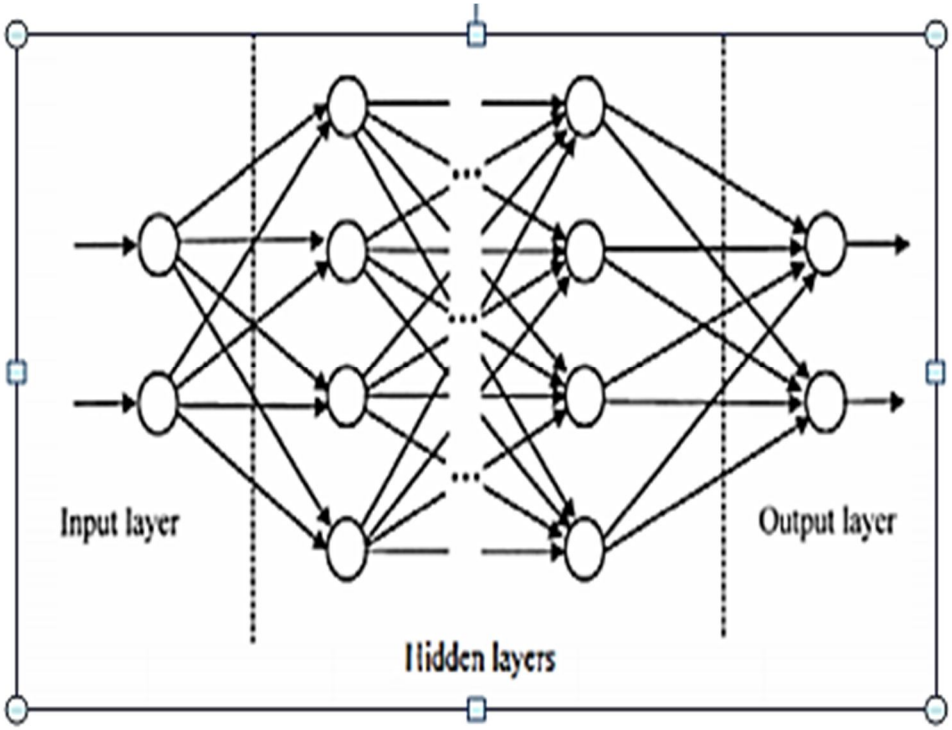

FIG 1. ANN working model

B. Random Forest

Random Forest model is an approach of predictive machine learning modelling which is based on decision tree learning. In this model observations are represented in the branches and on the leaves conclusions are displayed. Random Forest working shown in fig 2.

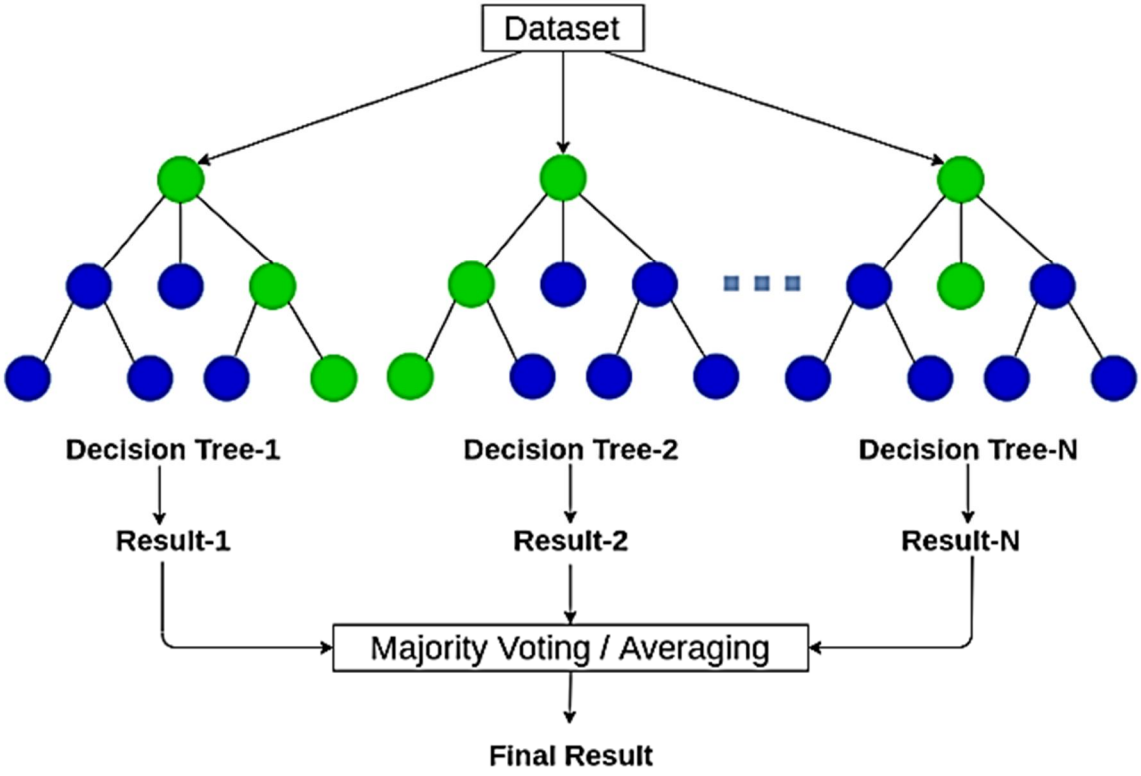

FIG 2: Random Forest Working Model

Diff Macroeconomy indicators are as follow

Table : Diff Indicators Used

S.No	Macroeconomi	S.No	Macroeconomics Indicator
1	ROC	9	Stochastic oscillator
2	KC	10	Ease of Movement
3	MACD	11	MassIndex
4	RSI	12	CP
5	Bollinger Band	13	FORCE INDEX
6	CC	14	Williams %R
7	SMA	15	Commodity Channel Index
8	TSI	16	EMA

II. METHODOLGY

In this proposed system we collect data presented through www1.nseindia.com for analysis and prediction and we also collect data from www.kagel.com. In this we used nineteen years (2000–2019) data for prediction. We divide this process into three Steps.

1) *Step 1:* We collect data from www1.nseindia.com and www.kagel.com. Then filter the data using Apache Sparks and Cloud era using separate data filtration commands.
2) *Step 2:* We implement six-ten stock indicators using the Python language for the implementation of this indicator and the FitchHarm interface.
3) *Step 3:* After the implementation of the indicator we predict the future values of the data using machine learning libraries such as Nampi, Pandas, MatPlotLib and Scalar. We divide the data into two parts test set and test set.

Fig 3. Workflow of proposed System

III. RESULT AND DISCUSSION

A. *Bollinger Band*

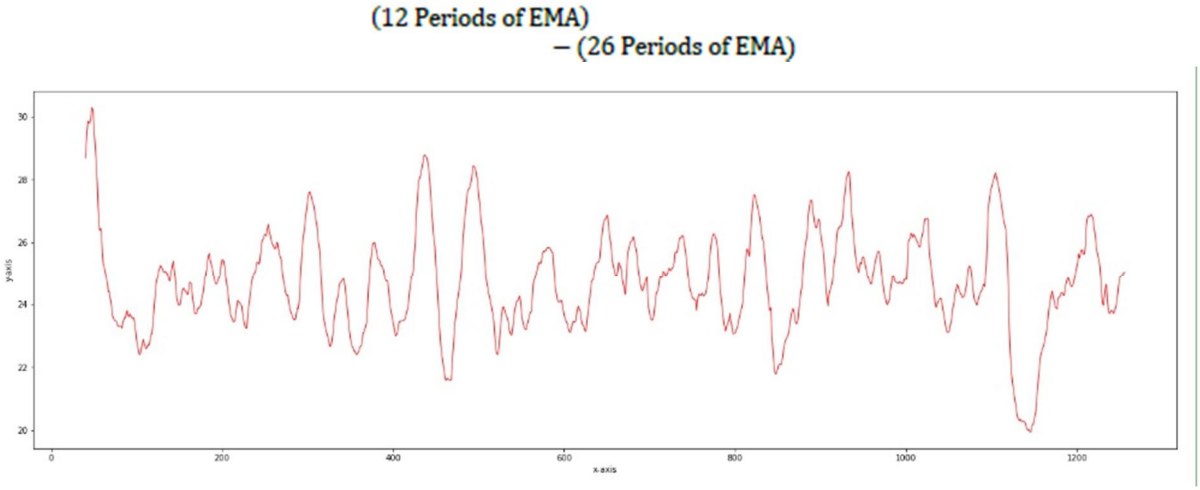

FIG : Represent BolllingerBand

B. *CC*

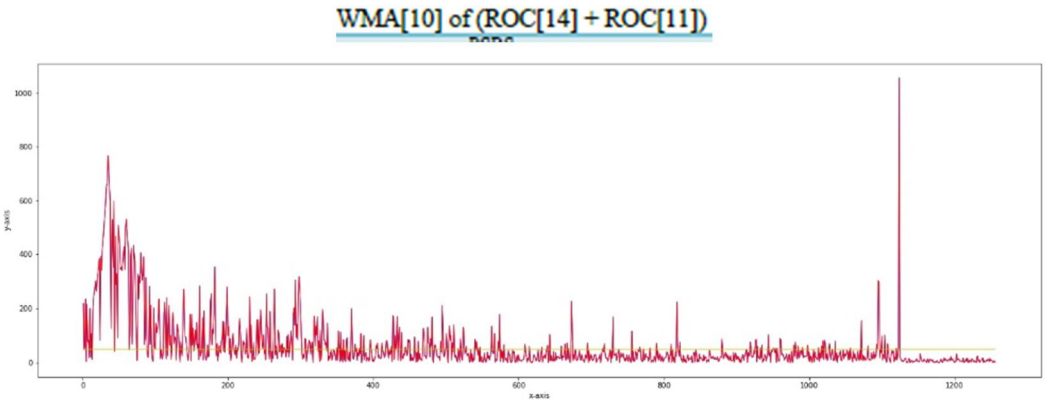

FIG : Represent cc

C. TCI

$$\frac{PCDS}{APCDS} \times 100$$

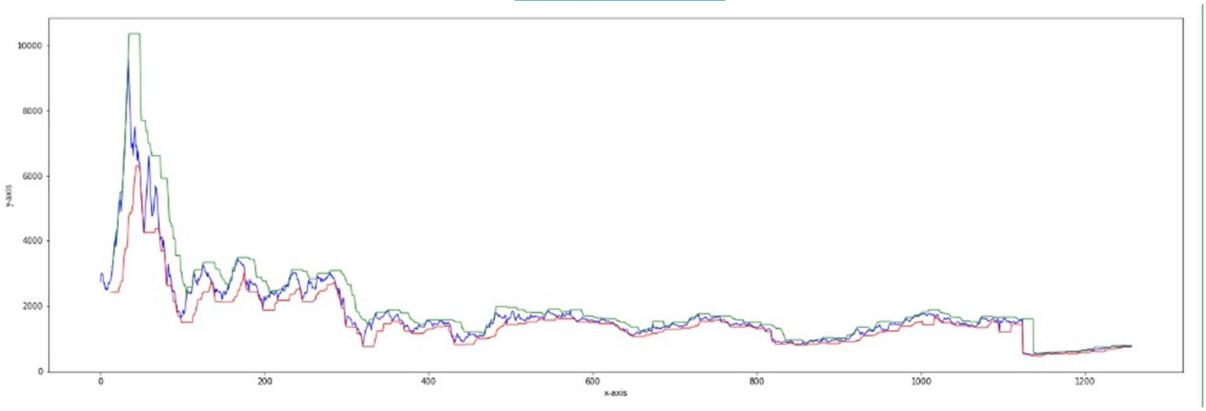

FIG : Represent TCI

D. CP

$$\left(\frac{(\text{closing price}_p - \text{closing price}_{p-n})}{\text{closing price}_{p-n}}\right) \times 100$$

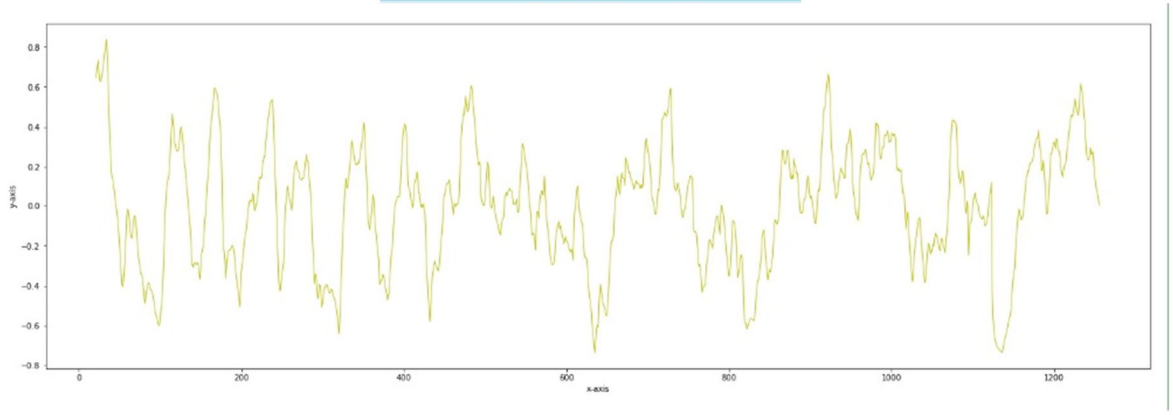

FIG : Represent Cp

E. RCI

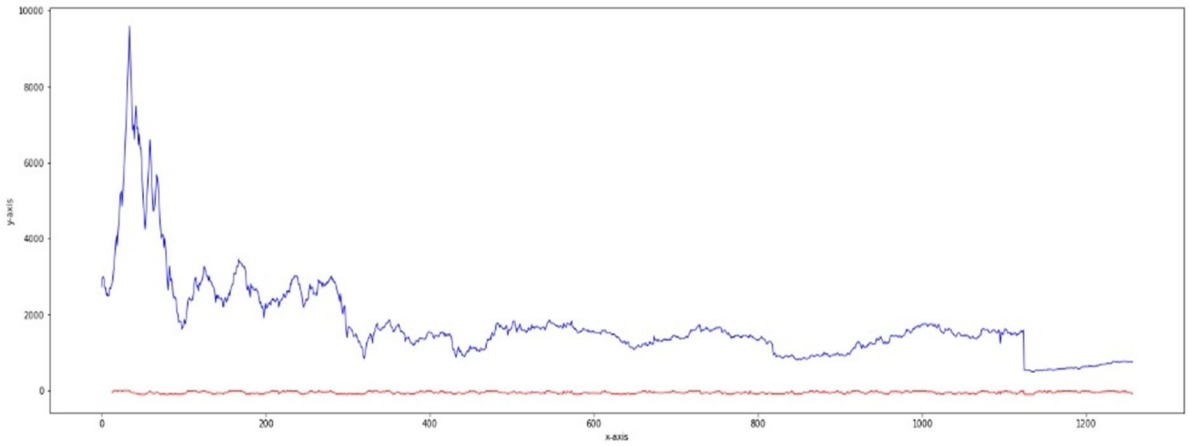

FIG : Represent RSI

F. SMA

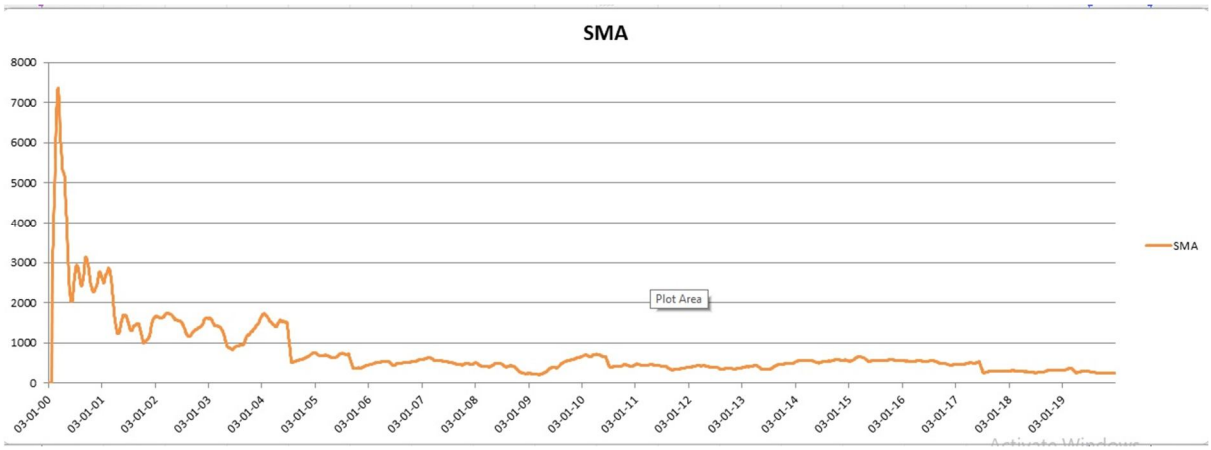

FIG : SMA

G. ROC

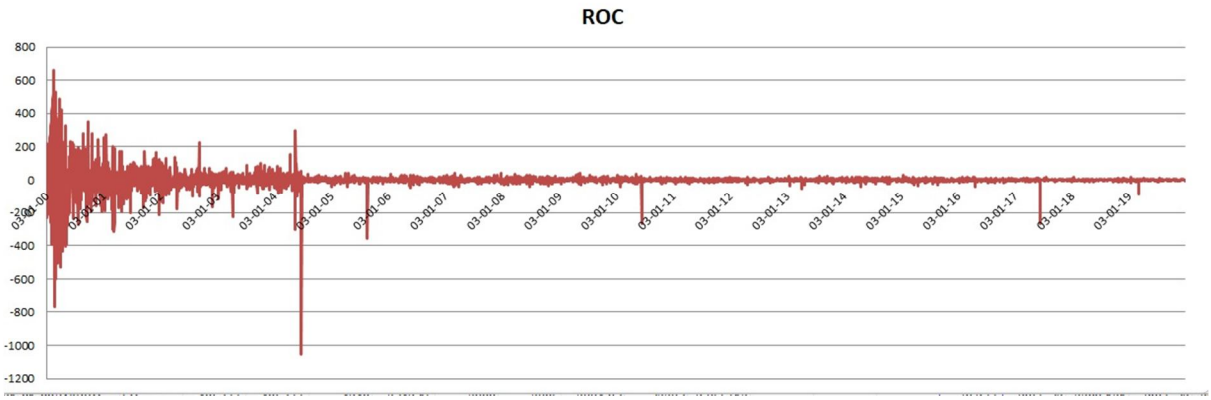

FIG : Represent ROC

H. EMA

$$\frac{(N - \text{period sum})}{N}$$

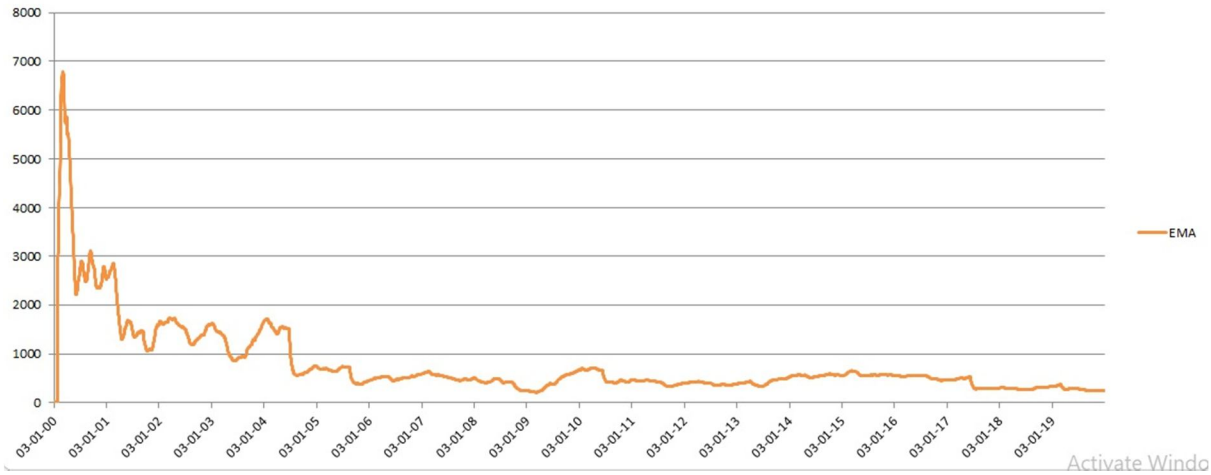

FIG : Represent EMA

I. Accuracy

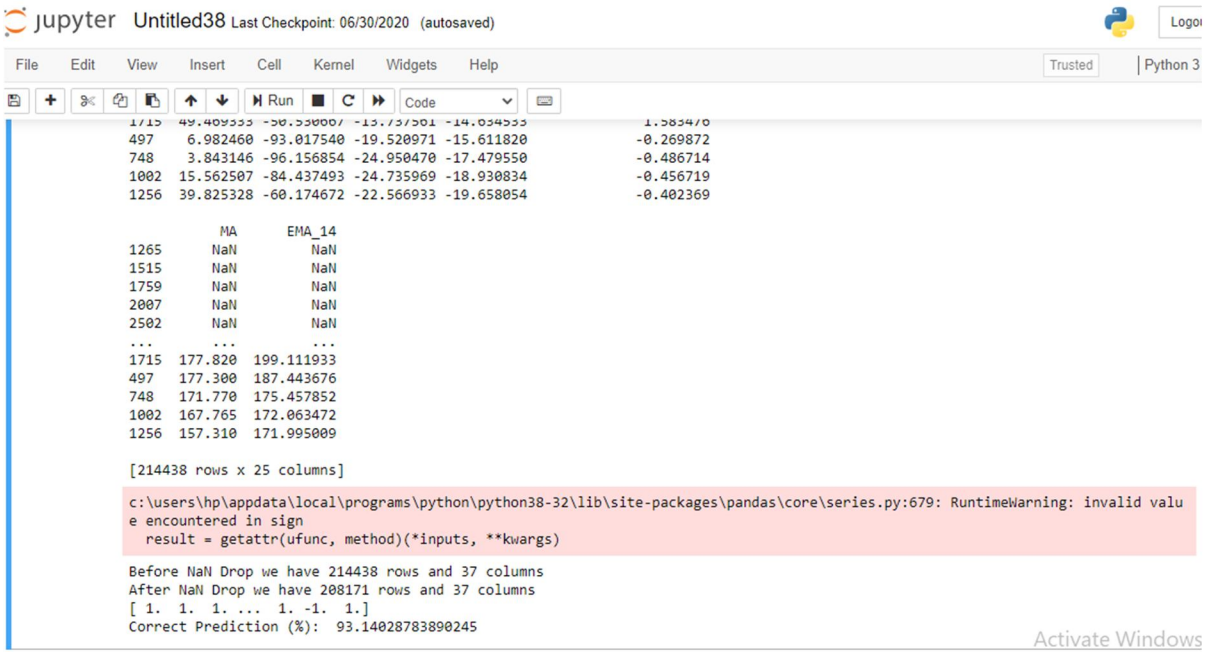

FIG : Represent Accuracy

IV. CONCLUSION

This paper will provide a prediction of future stocks whether the stock will close up or down. This will give you an idea of the prediction based on the data of previous days. The study can be applied to any stock market whether Indian or others in the world. Nineteen years of stock data from the Nifty-50 have been taken as a sample to demonstrate the methodology in this work. Macroeconomics indicators applied to this data with the help of machine learning library. The random forest algorithm technique is applied to the final compiled result and an accuracy of 93.3% is achieved. By applying this method to the stock market of any nation, the function of these six indicators can be tested and the result can be improved by the use of some other stock indicators available in the stock market world.

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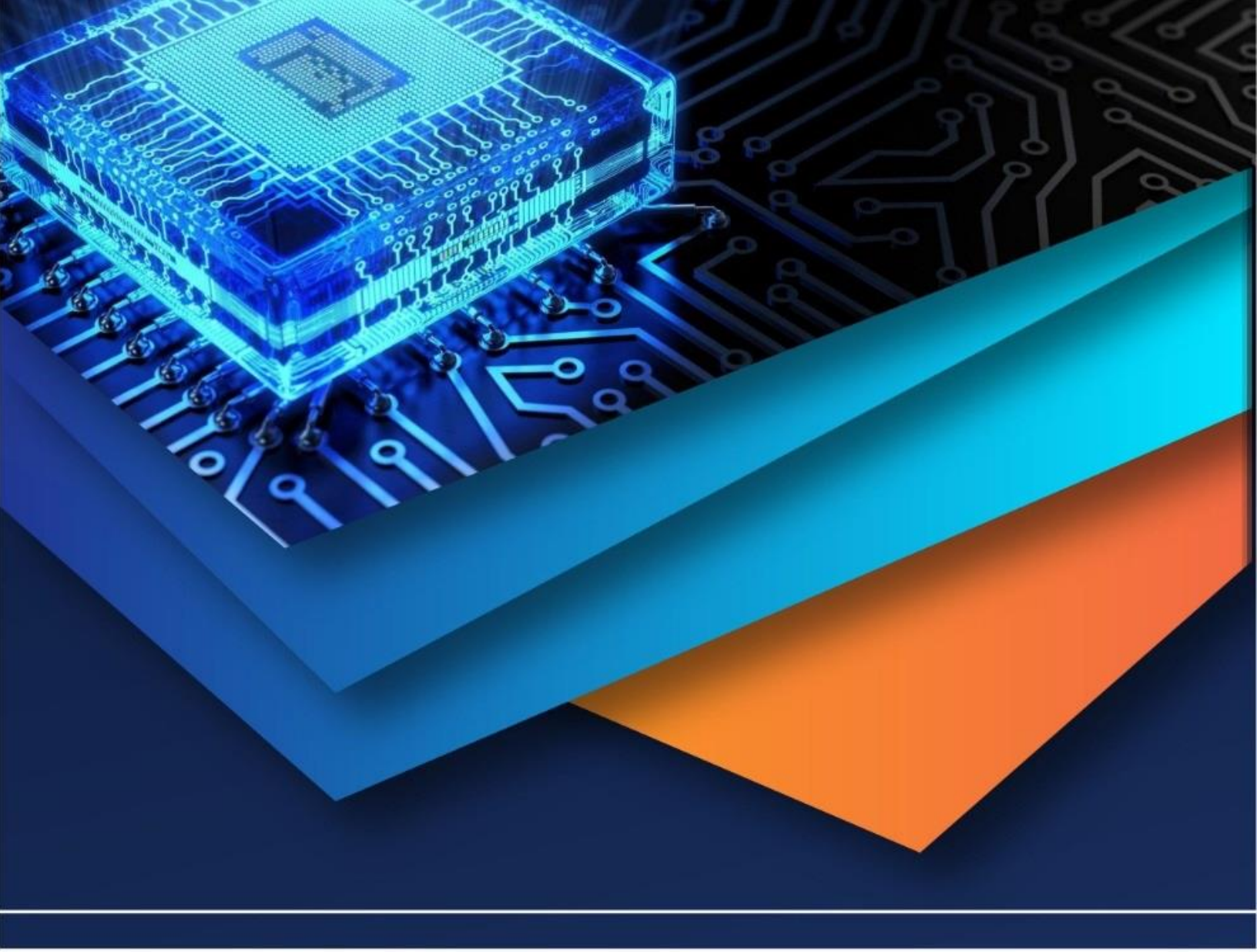

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