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Short-Term Cryptocurrency Price Fluctuation Prediction Framework Using Machine Learning

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Abstract: ***Our project aim is to predict the future price of the bitcoin using machine learning algorithms. In the modern world cryptocurrency is become more trendy and reaches the youngsters to invest in the stock market and to generate some profitable trades. To invest their money in cryptocurrency we are just helping the investors like peoples and also involving the organization to invest in the bitcoin and to make good profitable trades. Initially it utilizes the historical data to predict the future price of the bitcoin. It involves considering factors such as market sentiment, news and events ,technical analysis, and global economic trends. Different machine learning algorithms are applied on the a data and the accuracy is compared to see which algorithm performed better. It includes the performance metrics like precision, recall scores are also taken into consideration for evaluating the model In cryptocurrency market it contains 'n' number of coins .Among those coins we can take any coin to predict the future price which will able to help the investors who are all investing their money in cryptocurrency market.***
Keywords: Machine Learning, Support Vector Machine.

I. INTRODUCTION

In recent years, the evolution of the cryptocurrency become very high in range. The people who are all investing their money in cryocurrency are growing in fast manner. So in along with booming technology the project was built and will be deployed in right manner. A short-term cryptocurrency price fluctuation prediction framework involves the previous year datasets. It can able to predict the small fluctuations in the datasets. Initially the datasets was analyzed by the algorithm and bring the nearest prices by differentiate the acutal price and predicted price. The previous year datsets helps to predict the future price of the bitcoins.

In addition to predicting the price of the bitcoin it includes the datestamp of the previous year datasets. It helps the algorithm to predict the price of the future dataset. By seeing the past dataset we can able to identify the fluctuation of the prices of the bitcoin which helps the people to invest on right date and to generate profitable trades.

Overall, an short-term cryptocurrency price fluctuation prediction framework helps the people and has the potential to predict the accuracy of the future price of the bitcoin.The datasets helps to optimize the price of the future price of the bitcoin using machine learning algorithms

II. TECHNOLOGY

The Machine learning(ML) describes the growing field of data science. By using the statistical methods the algorithms are trained to make classifications or predictions. It is created by using frameworks that accelerate solution development by including python packages. The machine learning process includes the decision process, The Error function and to overcome by the model Optimization Process.

The KNN usually works by identifying the closest datasets and plot the points in the dimensional space. The price which closest to the dataset helps to point the price and to replace the price by the closest price to predict the future price of the cryptocurrency market.

The support vector regression is an sub component of the support vector machine which works in the flow of by creating the margins between the data points and bring the next closest price to the margin and predict the future price of the bitcoin.

Over the past few years, ML has become one of the most important technologies of the 21st century. Now that we can apply the things in the trades which help the people or organization to make the profit generatable trades by applying some statistical analysis using predictive algorithms.

By means of low-cost computing, physical things can share and collect data with minimal human intervention. And to implement the algorithms to predict the fluctuations of the prices without involving any human interaction it helps the people to invest their money in efficient manner

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A. Methodology

Collecting Dataset

Pre-processing

- Data cleaning
- Data transformation
- Data selection

KNN, SVM Algorithm

Front End

B. Result

1) Data Collection

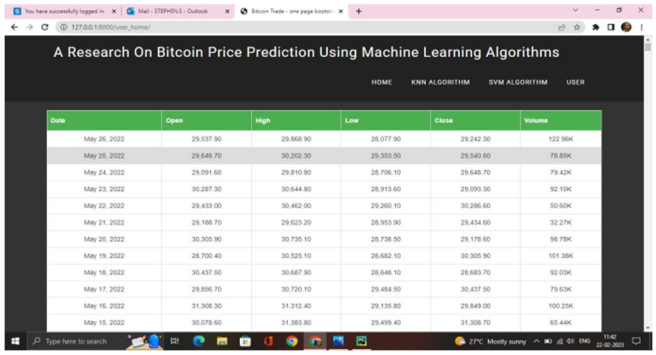
Data Collection is one of the most important tasks in erecting a machine learning model .We collect the specific dataset grounded on conditions from internet. The dataset contains some unwanted data also. So first we need to pre-process the data and gain perfect data set for algorithm. In our study Bitcoin values are collected from various previous year Datasets.

2) Pre-processing

a) Data Cleaning: Data cleaning is one of the important corridors of machine literacy. It plays a significant part in erecting a model. It surely isn't the fanciest part of machine literacy, and at the same time, there aren't any retired tricks or secrets to uncover. Still, the success or failure of a design depends on proper data cleaning. Professional data scientists generally invest a veritably large portion of their time in this step because of the belief that "more data beats fancier algorithms." Still, there are chances that we can get good results with simple algorithms, which can prove veritably salutary at times, especially in terms of calculation when the dataset size is large if we have a well-gutted dataset.

3) Data Transformation: Data transformation is defined as the technical process of converting data from one format, standard, or structure to another – without changing the content of the datasets – typically to prepare it for consumption by an app or a user or to improve the data quality.

4) Data Selection: A training set is used to train the machine learning process to understand the potential relationship between the explanatory variables and the target variable. A test set is used to validate the performance of the learned relationship. The data selected in the training set should also be representative of the test set.



III. KNN (K-NEAREST NEIGHBOUR ALGORITHM)

This algorithm applied to predict the price movement of Bitcoin.The code uses the pandas and Numpy libraries to process the data and sklearn library's K-neighbours Classifier to build the model.

The input data for this model is the historical prices of Bitcoin, which is read from the 'bitcoin_price.csv' file. The data is cleaned by dropping any missing values and keeping only the relevant columns ('Open', 'High', 'Low', 'Close').

The code then calculates two new features: 'Open-Close' and 'High-Low', which represent the difference between the opening and closing prices and the difference between the highest and lowest prices, respectively.

The target variable for this model is the direction of the price movement (up or down) in the next time period. This is calculated by comparing the current day's closing price to the next day's closing price. If the next day's closing price is higher, the target variable is set to 1 (up), otherwise it is set to -1 (down).

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The data is split into training and testing sets using a split percentage of 70%. The model is instantiated with a K value of 15, and is trained on the training set using the fit method. The accuracy of the model is calculated using the accuracy_score method on both the training and testing sets.

The model's predictions are then used to generate trading signals by multiplying the target variable by the predicted direction of the price movement. This is done for both the testing and training sets.

Finally, the cumulative returns of both the SPY index and the trading strategy are calculated and plotted using Matplotlib library. The results are shown in a plot with the cumulative returns on the y-axis and the time period on the x-axis.

The output of this code is a webpage showing the accuracy scores of the training and testing sets.

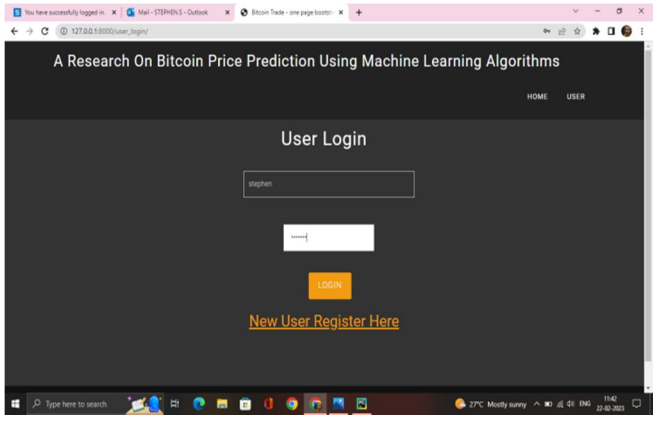
IV. SVM(SUPPORT VECTOR MACHINE)

To predict the bitcoin prices the SVM algorithm is implemented. The code reads the CSV file containing historical Bitcoin price data, preprocesses the data to create a dependent variable for predicting future prices, splits the data into training and testing sets, trains an SVM model on the training set, and evaluates the model's accuracy on the testing set. Finally, the code uses the trained model to make predictions for the next 30 days of Bitcoin prices.

The SVM algorithm used here is the radial basis function (RBF) kernel, which is a popular choice for regression problems. The SVM is trained to predict the future closing price of Bitcoin based on the previous prices and other features such as open, high, and low prices. The accuracy of the model is evaluated using the score method, which returns the R-squared coefficient of determination. The predicted values are then plotted against the actual values to visualize the model's performance.

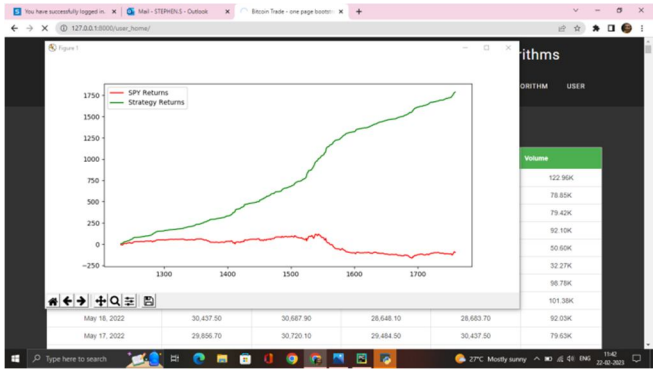
V. FRONT END

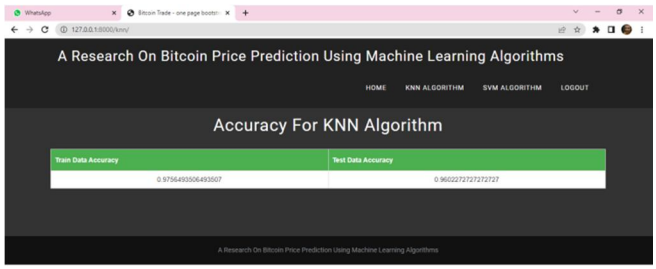
Front-end web development is the development of the graphical user interface of a website, through the use of HTML, CSS, and JavaScript, so that users can view and interact with that website .In our study the front end is created using HTML,CSS and connected through Django server.



VI. RESULT

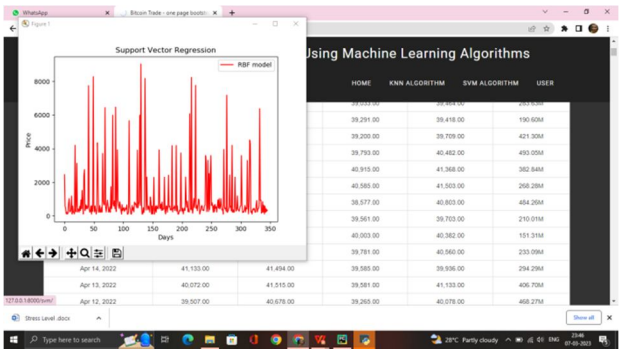
A. KNN

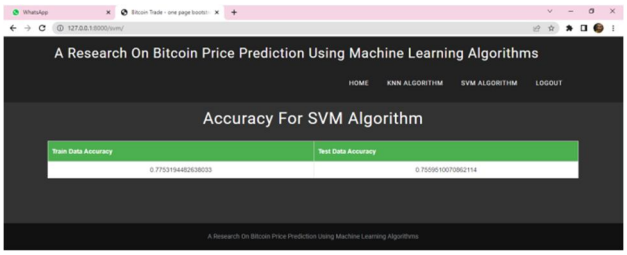






B. SVM







VII. LITERATURE SURVEY

The regression based analysis for bitcoin price prediction talks about the plan and conveyance of venture based learning in software engineering Designing as significant task which recieves undergrad
creativities and underlines on genunine world, open-finished activities. It includes the neural network regression uses adaptive weights and are able to approximate non-linear functions about their inputs.it is a feed forward neural network.[1]

An cryptocurrency price prediction using neural networks and deep learning. This methodology includes the regerssion based algorithms in order to predict the price direction of bitcoin and by directing the predictive analysis in the rightway to bring out the profitable trades. By providing comparative studies and findings from the price data of cryptocurrency markets, it will further help document the behavior and habits of such a lucratively challenging and rapidly expanding market by bringing out the process by using the neural networks and deep learning [2]

The prediction of bitcoin price using BI-LSTM network. It includes the features that are not directly tied to price data such as transaction count, on-chain transaction volume, value of mined coins, market cap, and exchange volume of the bitcoin blockchain.

By bringing that application in the form of mobile app. Initially the user gives the input either manually or by using the volume button by clicking it on the application icon.

The leveraging the users graph and trustful transactions for the analysis of bitcoin price includes the terms in form of the usage in trade in the means of money supply, price level, and interest of investors drives the price of bitcoin

A. Social Impact

1) To show the statistical trend in cryptocurrency market

2) The framework can increase the transparency of the cryptocurrency market

3) The framework can help investors and traders to manage the risk.

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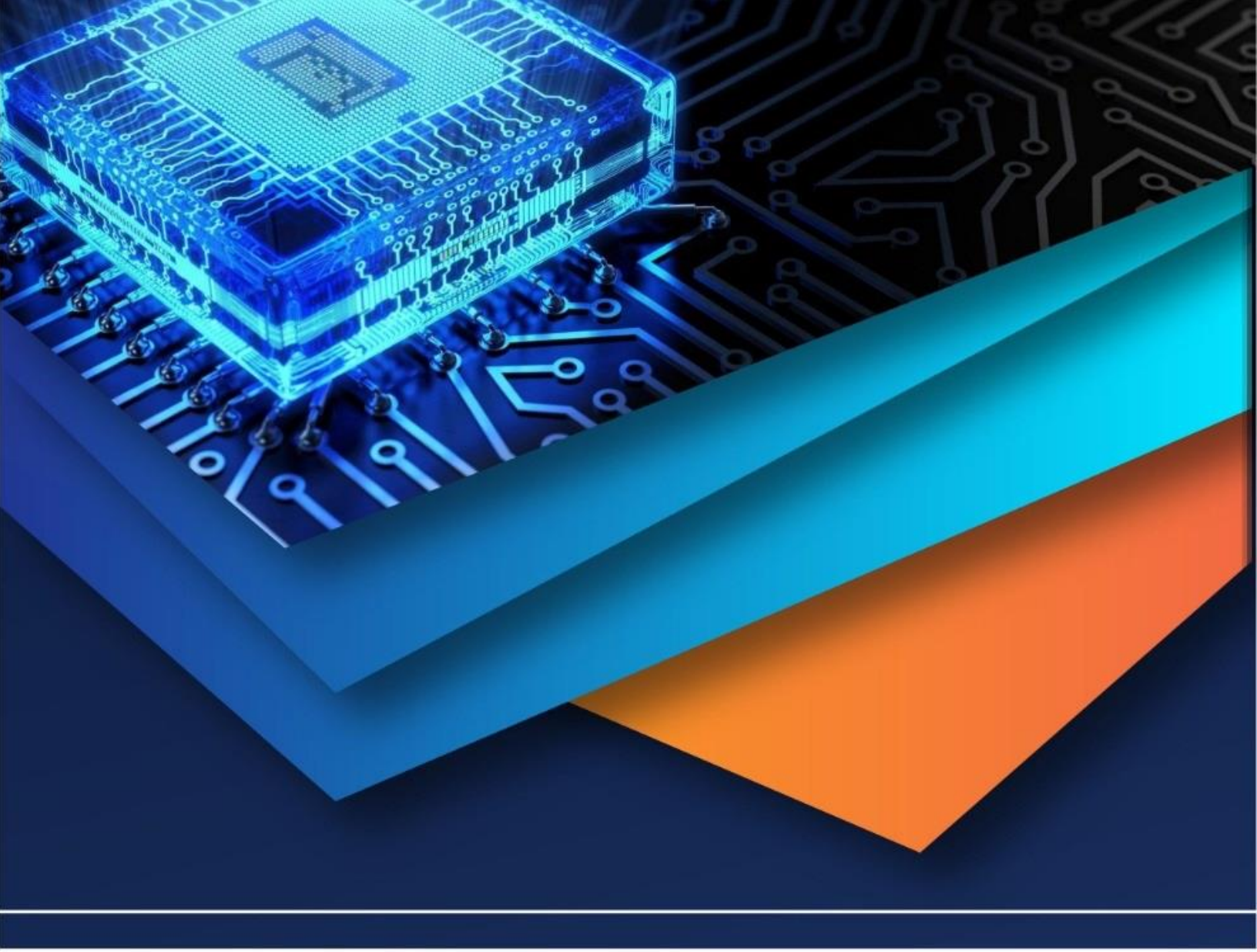
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