PROJECT TITLE: “Bitcoin Price Prediction Using Arima Model’’

PROJECT DESCRIPTION:

Bitcoin's erratic price changes in recent years have attracted substantial attention. Due to its extremely erratic price swings, decentralised digital currency Bitcoin has attracted a lot of attention recently. In order to make informed decisions about buying and selling Bitcoin, it is essential that investors and traders are able to make accurate Bitcoin price predictions. To forecast future Bitcoin values, we will use the ARIMA (Autoregressive Integrated Moving Average) model. We can follow the steps outlined below:

Step 1: Data Collection

Data on Bitcoin prices will be collected from a variety of sources, including cryptocurrency exchanges and financial websites. Daily or hourly price points, as well as other pertinent information like trade volume and market capitalization, shall be included in the report.

Step 2: Data Pre-processing

To make sure the data is in a format that will work for our ARIMA model's training, we shall pre-process it. To do this, the data is cleaned, missing value issues are resolved, and the data must is transformed into a time series format. Moreover, feature engineering will be used to glean valuable information from the raw data.

Step 3: ARIMA Model Selection and Training

Also used ARIMA model parameters such as order and lag values to predict the future prices of Bitcoin. To make our predictions more accurate, we used the training data to adjust the parameters and fit our ARIMA model.

Step 4: Model Evaluation

By contrasting our ARIMA model's predictions with the actual Bitcoin prices in the testing set, we can assess how well it performed. To measure the precision of our model, we employed measures like mean squared error (MSE) and mean absolute error (MAE). To further understand the performance of the model, we showed the anticipated prices and contrast them with the actual prices.

Step 5: Conclusion

In this project, we have demonstrated that an ARIMA model can reasonably predict the future prices of Bitcoin. Our findings imply that judicious parameter selection and the use of historical data can enhance the performance of our model. For investors and traders who want to purchase and sell Bitcoin with knowledge, our insights may be helpful.

APPLICATIONS:

Trading: A Bitcoin prediction model's main use case is trading. The model can be used by traders to forecast Bitcoin values in the future and help them decide whether to purchase or sell the commodity.

Investment: The Bitcoin prediction model can help investors make well-informed choices. Investors can choose when to acquire or sell an item to maximise their returns by forecasting future Bitcoin prices.

Risk management: Bitcoin prediction models can assist investors and traders in controlling their exposure to risk. Traders can minimise their losses in the event of unanticipated price swings by taking the necessary action by forecasting future prices.

Research: In order to better understand the variables that affect the price of bitcoin, it is possible to employ Bitcoin prediction models for study. The model can be used by researchers to examine how various factors, such as current events and market trends, affect the price of bitcoin.

Forecasting: Prediction models for bitcoin can also be used for forecasting. Trading, investing, and research professionals may make informed decisions on the direction of the cryptocurrency market by forecasting future Bitcoin values.

In summary, the ARIMA-based Bitcoin prediction model has the potential to be a valuable resource for various applications within the cryptocurrency market.

The steps for implementing ARIMA model are as follows:

1.Data Pre-processing: Cleaning and converting the data into a time series format is known as data preprocessing. This could entail handling missing values, smoothing the data, and picking the right time window.

2. Stationarity Testing: Examine the time series' stationarity to see if it meets the condition for ARIMA modelling. The term "stationarity" refers to a series' mean and variance remaining constant across time. If the time series is not stationary, differencing can be used to make it stationary.

3.Determine Model Parameters: Identify the ARIMA model's parameters. This involves choosing the placement of the moving average (q), integrated (d), and autoregressive (p) components. To find the ideal values of p, d, and q, we can make use of techniques like autocorrelation function (ACF) and partial autocorrelation function (PACF) plots.

4.Model Fitting: Using the chosen parameters, fit the ARIMA model to the training set of data. This entails utilising maximum likelihood estimation to estimate the model's coefficients.

5.Model Evaluation: Analyze the ARIMA model's performance using the test data. Metrics like mean squared error (MSE), mean absolute error (MAE), and root mean square error can be used to accomplish this (RMSE).

6.Model Tuning: To increase the model's performance, experiment with various parameters and fine-tune it.

7.Forecasting: Forecast future time series values using the trained ARIMA model. This entails forecasting the time series' future values using the fitted model.

8.Model Validation: By contrasting the projected values with the actual values of the time series, you may validate the model's performance.

Overall, there are a number of processes involved in the development of an ARIMA model, all of which need for careful analysis of the data and model parameters. But, when used correctly, ARIMA models are capable of accurately forecasting time series data, including Bitcoin values.

ARTIFICIAL INTELLIGENCE (UCS411)

AI Project Synopsis

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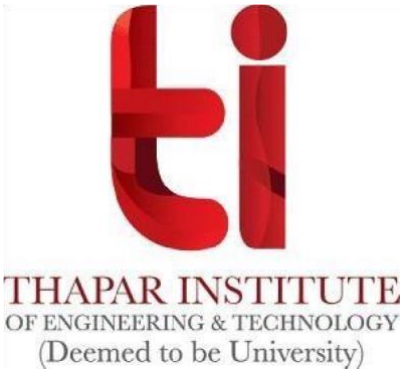

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