CRYPTOCURRENCY PRICE FORECASTING

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ABSTRACT
Cryptocurrency is more prevalent these days among financial investors. It is examined to figure the cost accurately considering different parameters that impact the cryptocurrency cost. The dataset is taken with cost subtle elements of different cryptocurrencies till current date. In this venture, Facebook prophet model is utilized, it could be a time-series estimating model for predicting future cost. And few cryptocurrencies are considered, namely Bitcoin (BTC), Ethereum (ETH), Dogecoin (DOGE), Cardano (ADA), BNBcoin (BNB), USDcoin (USDC), Tie (USDT), XRPCoin (XRP). Facebook prophet demonstrate may be a machine learning model, utilized for used for prediction and understanding the change in trend based on regularity, the regularity in this extend is day by day. The result portrays that FB prophet model precisely predicts the costs of various cryptocurrencies. **Keywords:** Cryptocurrency Prediction, Machine Learning, FB Prophet.

I. INTRODUCTION
Cryptocurrency is a virtual or digital currency used in economic systems. It is secured by cryptography that makes it impossible to be counterfeited. Further, it is not obtained from a central authority or central banks, and it is decentralized virtual currencies that can be converted via cryptographic procedures and this make it distinguishable from traditional currencies. The other feature is that it is created by technology called blockchain, which is an extremely complex, and aims to storing data that makes it difficult or impossible to alter, hack the technique.

Many people have made a lot of money by investing in the digital markets, but every investment process comes with its own set of hazards, and some investors, especially those with a high risk tolerance, are interested in investing in cryptocurrency. Market analysts and speculators rely on prediction as a result. Machine learning and artificial intelligence algorithms are fairly intriguing due to variances in forecasting capacity per coin.

Cryptocurrencies with a low volatility are more predictable than those with a high volatility. There is evidence that the utility of different information sets varies between machine learning methods, meaning that prediction is likely to be significantly more complicated when multiple machine learning algorithms are implemented. Due to price volatility and dynamism, cryptocurrency prices are difficult to forecast. There are hundreds of cryptocurrencies available to clients all around the world.

II. RELATED WORK
There are many investigators found Bitcoin is of interesting study and extended their research on it. Some of the are discussed below in Bitcoin price prediction is handled through machine learning algorithms in [1]. The authors in the work proposed many machine learning models and surveyed more than seven algorithm for the price prediction of different coins.

However, this information has given very less accuracy on price predictions, which varies from 52 percentage to 56 percentage. Whereas, Bitcoin is traded all over the world needs an accurate and high level price forecasting and projects for the investors. The work [2] discussed about Bitcoin price prediction using LSTM methods. The authors had evaluated price prediction with varying number of epoch from 10 to 500 and find the optimized results at an epoch level of 500. However, they achieved price predictions, the RMSE (Root Mean Square Error) values is 288, which is considered to be high on error values. Thus more optimized results are needed for predictions. Moreover, the price projects not handled.
The work [3] has analyzed the user to get profit for trading in bitcoin market. This work has given a core to individual user for handling the trading. The work is considered out with high number of nodes and edges. The rating among the user is done between 10 to 10, where 10 is considered as at least core and 10 is considered as the highest core values. The users from social media is considered for the study by creating DAG (Directed Acyclic Graph). This detailed input recommended the new users for trading suggestions.

Many existing works have done the sentiment analysis as one of much important factor for investing the prices. This type of analysis can be useful for long term price sentiments, whereas traders needed more specific analyze, which is much suitable on price prediction. The work [4] represents, such a sentiment analysis work, where the data fed from crowd sourced data and economic data. The crowd sourced data in terms collected from twitter data. In this work, the author used ARIMA model for learning and predictions.

III. PROPOSED WORK

We introduce a fast and accurate predicted prices for each and every coins that we have considered. The prices of the cryptocurrency are predicted based on the daily basis. And about 10 different currencies prices have been predicted inorder to make the investors to invest wisely in whichever type of cryptocurrency they would prefer.

We have used Facebook Prophet model which is a time-series forecasting model for predicting the future price of different cryptocurrencies. It is highly beneficial to make predictions compared to other traditional algorithms that just gives us one price point as the predicted value. This algorithm give accurate, fast and reliable outcomes.

In this paper, Facebook prophet Model is used, and few types of cryptocurrencies are considered, namely Bitcoin (BTC), Ethereum (ETH), Dogecoin (DOGE), Cardano (ADA), BNBcoin (BNB), USDcoin (USDC), Tether (USDT), XRPcoin (XRP). The result depicts that FB prophet Model predicts the prices of cryptocurrencies based on seasonality, the seasonality in this project is daily.

Considering the highly hypothetical nature of different cryptocurrencies like Bitcoin, The Facebook Prophet is highly beneficial to make predictions compared to other traditional algorithms that just gives us one price point as the predicted value.

It builds a model by finding the best smooth line represented by:

- It accepts only two columns ds and y we take ds as DATE and y as PRICE.
- Data frame is used to put all the newdata.
- By initializing prophet() we fit the model for pre-processing.
- Took seasonality of Daily for forecasting the price of coins.
- The predicted values are obtained for chosen coin.

![Fig.1. Block Diagram](image-url)
IV. RESULTS AND DISCUSSION

The Cryptocurrency price forecasting is provided with a Interface which allows the user to enter type of coin to predict and for how many days is to be predicted. And the forecasting will be done at the backend, that is written in python and resulted in the interface as tabular form and graphical form. The IDLE is used to experiment with the project and is run on a PC for the experiment which is equipped with a Personal laptop embedded with an Intel Core i5 8th Gen processor along with 1TB HDD, 512GB SSD, and 8GB RAM.

This project results that future price of the cryptocurrency, which is useful for the investors to invest.

1. Selecting number of days and type of coin to forecast

Fig 2: Input screen for type of coin

Fig 3: Input screen for No. of days

The various steps in the system that followed for price forecasting

Data Preprocessing: This is the technique used to clean the raw data and organise the input data to make it suitable for our fbprophet model.

Construction & Decomposing Time Series: By using this construction and decomposing the use case related to analysis, was taken into consideration. The important factors involved in time series are, Daily, Weekly, Monthly & Yearly selections.

Building Model: This step involved the creation of a fbprophet model based on selected parameters like date and price for the prediction of data.

Prediction: This final step involved the forecasting of the model based on testing data and observing how it performed.

Outputs

Fig 4: Forecasting in Tabular Form
In this paper, a type of machine learning algorithms are constructed and used for predicting the prices of few types of cryptocurrency like BTC, ETH, LTC, ADA, XRP, DOGE, USDC, USDT. Different performance metrics were conducted to test the accuracy of different machine learning models. And then the actual price and the predicted prices will be predicted. The results show that fbprophet algorithm gives an accuracy of about 70% in predicting prices for BTC, ETH, LTC, respectively. The Facebook Prophet is better than LSTM because Facebook Prophet not only gives us the predicted value, but also gives us the upper limit (which is the highest price of the coin) and the lower limit (which is the lowest price of the coin) of prediction, which might be very beneficial for investors to know. Instead of having one predicted value or one parameter to know with, now we have three.

The experimental results show that:

- The machine learning algorithm is reliable and acceptable for cryptocurrency prediction.
- Prophet model can predict cryptocurrency prices better than LSTM, SVM, Random forest but overall all algorithms represent excellent predictive results.

VI. REFERENCES


