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# Crypto Currency Market Price Prediction using Data Science Technique

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**Abstract**: *Cryptocurrency is commonly called as digital currency where the coin ownership records are stored in an electronic ledger existing in a form of a computerized database using strong cryptography approach which is used to maintain the creation and updation of an addition coin in a market, it is also used to check and maintain the current ownerships of the coins. Nowadays cryptocurrency is used in largescale and there is a sudden rise or decrease in their share and it is difficult to predict the price of the crypto currency. In this project a machine learning model is built to predict the price of crypto currency. The application of data science process is applied for getting the better model for predicting the outcome. Variable identification and data understanding is the main process in building the successful model. Different machine learning algorithms are applied on the pre-processed data and the accuracy are compared to see which algorithm performed better other performance metrics like precision, recall, scores are also taken in consideration for evaluating the model. The machine learning model is used to predict the crypto currency outcome.*

**Keywords**: Crypto Currency, Decision Tree, Prediction, Random Forest, Logistic Regression, Linear Regression, LASSO Regression, Ridge Regression

## I. INTRODUCTION

A cryptocurrency is a type digital currency which can be used a mode of online payment or make an individual to sell/purchase cryptocurrency to utilizing various monetary forms. The Cryptocurrency transaction are stored and maintained in an electronic ledger and even supports blockchain transactional databases. Bitcoin is the earliest invented cryptocurrency and has been in trading since 2009. There are around 7577 different Cryptocurrencies available in the market. We can use straightforward utilization methods likeMachine learning or Data science to predict its values. Machine learning has a huge amount of regression algorithms. Which can make our task easier. Data science techniques like Random Forest regression, Ridge regression, LASSO regression, Linear regression can be used to predict the future price of a Cryptocurrency and predict future outcomes. In this paper we are going to use 6 different algorithms like Random Forest regression, Ridge regression, LASSO regression, Linear regression, Logistic regression and compareeach algorithms accuracy and root mean square value. In this paper we are also going to use 4 different and popular Cryptocurrency available in the current marker like Bitcoin, Ethereum, Cardano (ADA), Binance Coin (BNB). Find which algorithm has the best possible accuracy and implement it in our Machine learning model. Finally, this model can be used to predict the market price of each cryptocurrency. This paper can be useful for Several traders who are scared about investing in cryptocurrency because of the fear of frequent drop in price. But with data science and constant monitoring

## II. LITERATURE SURVEY

**A. Title:** Bitcoin Price Prediction Using Machine Learning
**Author:** Neha Mangla, Akshay Bhat, Ganesh Avabratha, Narayana Bhat
In this paper, we tried to estimate the Bitcoin price precisely taking into consideration various parameters that affect the Bitcoin value.In our work, we pointed to understand and identify daily changes in the Bitcoin market while obtaining insight intomost appropriate features surrounding Bitcoin price. We will predict the daily price change with highest possible accuracy. The market capitalization of publicly traded cryptocurrencies is currently above $230 billion.Bitcoin,

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the most valuable cryptocurrency, serves primarily as a digital store of value, and its price predictability has been well-studied. These characteristics are outlined in the following subsection; the underlying details of Bitcoin,as they are described in depth in the cited papers.

**B**. **Title:** A Research on Bitcoin Price Prediction Using Machine Learning Algorithms
**Author:** Lekkala Sreekanth Reddy, Dr.P. Sriramya
In this paper, we proposed to predict the Bitcoin price accurately taking into consideration various parameters that affect the Bitcoin value. By gathering information from different reference papers and applying in real time ,I found the advantages and disadvantages of bitcoin price prediction. Each and every paper has its own set of methodologies of bitcoin price prediction. Many papers has accurate price but some other don't, but the time complexity is higher in those predictions, so to reduce the time complexity here in this paper we use an algorithm linked to artificial intelligence named LASSO(least absolute shrinkage selection operator. The other papers used different algorithms like SVM(support vector machine),coinmarkupcap, Quandl, GLM, CNN(Convolutional Neural Networks)and RNN(Recurrent neural networks) etc.. which do not have a great time management, but in LASSO finding of the results from a larger database is quick and fast. so for this purpose we draw a comparison between other algorithms and the LASSO algorithm, this survey paper helps the upcoming researchers to make an impact in the their papers.

**C**. **Title:** Modeling and Prediction of Cryptocurrency Prices using Machine Learning Techniques
**Author:** Alireza Ashayer
The contents of this chapter have been submitted [13] to IEEE International Conference on Blockchain. The motivation for this review is to understand the trend of Blockchain research with respect to the machine learning field by studying and reviewing published articles. This understanding can help other researchers and practitioners with insight into the current state and future direction of research in this field. Given this motivation, we will review and verify the distribution of research papers by their year of publication

**D**. **Title:** Automated Cryptocurrencies Prices Prediction Using Machine Learning
**Author:** Ruchi Mittal, Shefali Arora and M.P.S Bhatia
Currently, Cryptocurrency is one of the trending areas of research among researchers. Many researchers may analyze the cryptocurrency features in several ways such as market price prediction, the impact of cryptocurrency in real life and so on. In this paper, we focus on market price prediction of the number of cryptocurrencies based on their historical trend. For our study, we tried to understand and identify the daily trends in the cryptocurrency market which analyzing the features related to the price of cryptocurrency. Our dataset consists of over nine features relating to the cryptocurrency price recorded daily over the period of 6 months. We applied some machine-learning algorithms to predict the daily price change of cryptocurrencies.

**E. Title:** Cryptocurrency Price Prediction Using Machine Learning
**Author:** K. Ramya Laxmi, Marri Abhinandhan Reddy , CH. Shivasai , P. Sandeep Reddy
The digital currency in which encryption techniques are used to regulate the generation of units of currency is said to be called cryptocurrency. The technology used here is used to explores the next day change in the price of cryptocurrency. It is a challenge for a common person to achieve with varying degrees of success. But this is achieved through the implementation of a optimized recurrent neural network (RNN) and a Long Short Term Memory (LSTM) network.

## III. SYSTEM ARCHITECTURE

This architecture diagram is the one which describes the overall view of this work. It is the pictorial representation of the entire work which is to be carried out. A system architecture can comprise system components that will work together to implement the overall flow of the process .This diagram clearly shows how the process works and gives the prediction output of market price in crypto currency.

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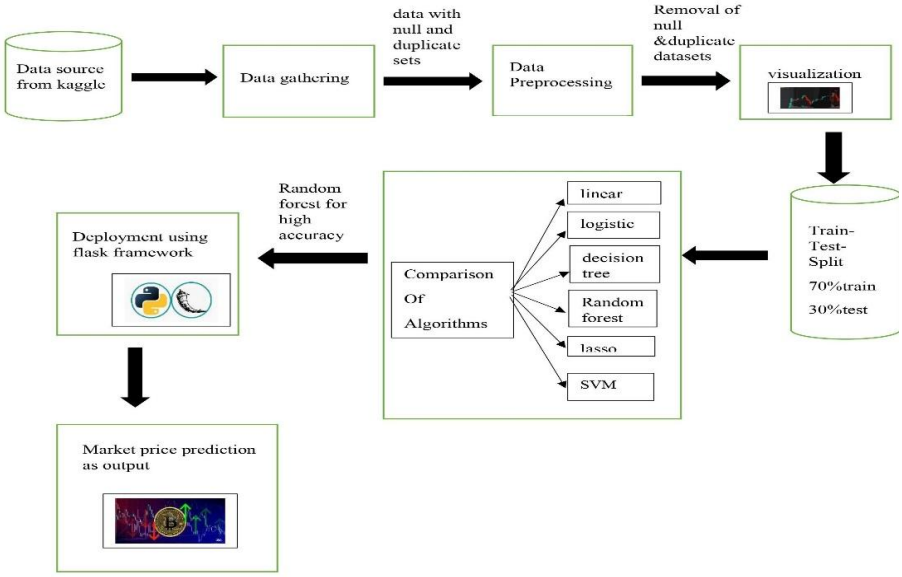


Figure 1. System Architecture

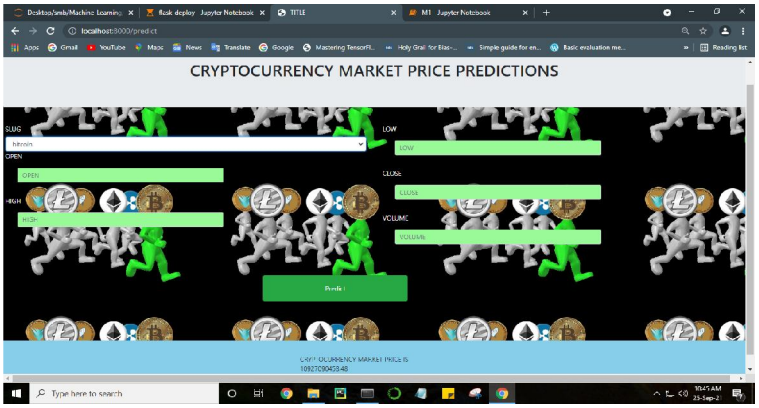


Figure 2. Output Screen

## IV. EXISTING & PROPOSED SYSTEM

### 4.1 Existing System

They presented a computational approach for identifying and characterizing crypto currency pump and dump operations that are carried out in social media. They had used financial and Twitter data pertaining to a particular coin, the method used was able to detect, with reasonable accuracy, whether there is an unfolding attack on that coin on Telegram, and whether or not the resulting pump operation will succeed in terms of meeting the anticipated price targets. They also analysed activities of users involved in pump operations, and observe a prevalence of Twitter bots in cryptocurrency-related tweets in close proximity to the attack. Telegram was a popular choice for scammers to organize and coordinate pump and dump operations. To analyse such activities, let us define the following two notions one was Pump Attempt which is the act of targeting a coin on Telegram by posting a pump message mentioning the coin as a “pump attempt. The second was Successful Pump Attempt which is the pump attempt is successful if the actual price approaches the target price within a time window after the first pump message has been posted.

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### 4.2 Proposed System

Then the pre-processing techniques are applied like dealing with the missing values the pre-processed data then used to build a model by dividing the dataset into 7:3 ratio where 70% of the data is used for training purpose that is model learns the pattern and the remaining testing data is used to test the performance of data. The regression model also can be used to predict the price of the cryptocurrency. For this project we took the cryptocurrenciesprice from a popularly known dataset website called Kaggle. The dataset (.CSV) is of size 100KB and contains historical prices of 4 different cryptocurrencies namely Ethereum, Bitcoin, Cardano and Binance-coin. Thedata consists of 1079 rows and Thirteen columns out which 1-144 is for Ethereum ,145-532 is for Bitcoin,533-773 is for Cardano and 774-1079 is for Binance-coin. Each column has a parameter of the data such as slug, symbol, name, date, rank, open, high, low, close, volume, market price, close ratio and spread. We are choosing this dataset for analyzing and predicting the market price of these 4 different cryptocurrencies

Table 1. Sample dataset

| | slug | symbol | name | date | ranknow | open | high | low | close | volume | market_price | close_ratio | spread |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | ethereum | ETH | Ethereum | 8/7/2015 | 3 | 2.830000 | 3.540000 | 2.520000 | 2.770000 | 164329 | 166610555 | 0.2451 | 1.02 |
| 1 | ethereum | ETH | Ethereum | 8/8/2015 | 3 | 2.790000 | 2.800000 | 0.714725 | 0.753325 | 674188 | 45486894 | 0.0185 | 2.09 |
| 2 | ethereum | ETH | Ethereum | 8/9/2015 | 3 | 0.706136 | 0.879810 | 0.629191 | 0.701897 | 532170 | 42399573 | 0.2901 | 0.25 |
| 3 | ethereum | ETH | Ethereum | 8/10/2015 | 3 | 0.713989 | 0.729854 | 0.636546 | 0.708448 | 405283 | 42818364 | 0.7706 | 0.09 |
| 4 | ethereum | ETH | Ethereum | 8/11/2015 | 3 | 0.708087 | 1.130000 | 0.663235 | 1.070000 | 1463100 | 64569288 | 0.8715 | 0.47 |

Table 2. Dataset description

| Parameter | Description |
|---|---|
| slug | Name of the coin |
| symbol | Type of the coin |
| name | Name of the coin |
| date | Date at which data is taken |
| rank now | Current rank of the coin in market |
| open | Opening price of the day |
| high | Highest price of the day |
| low | Lowest price of the day |
| close | Closing price of the day |
| volume | Total Volume of the currency |
| Market price | Market capital of the currency |
| Close ratio | Close ratio = (Closed deals) / (Total sales leads) x 100 |
| Spread | Difference between high and low value |

## V. PREDICTION TECHNIQUES

Six algorithms have been compared to predict the market price for cryptocurrency.

1. Logistic regression is mainly used in classification problems. Therefore, the outcome will not be correct for our problem. It mainly gives output based on probability either the value will decrease or increase, win or lose,1 or 0. So it is not possible to use this algorithm and predict the market price. It is generally used to predict if the market price will increase or decrease.
2. Linear regression is a regression-based machine learning algorithm which uses supervised data learning which means that it makes use of ladled data set. While predicting a dependant variable (y) based on a given independent variable (x), we use Linear Regression. This technique is also used to find out the linear relationship between x(input) and y(output).
3. Decision tree is also a supervised machine learning algorithm which is used for either classification or regression-based problems. It is a like tree-based structure, where the root nodes represent the entire sample, the Interior Nodes represent the different features of the data set like name, symbol, date, market price, volume, etc... and finally the leaf node is used to represent the outcome of the problem.

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4. Lasso regression is like linear regression but the main difference is that in LASSO regression it uses a simple method called "shrinkage" where the coefficient is shrunk towards zero. This allows us to regularize the coefficients to avoid overfitting problem and make them work better for our datasets
5. Support vectors are data points that are closer to the hyperplane and influence the position and orientation of the hyperplane. Using these support vectors, we maximize the margin of the classifier. Deleting the support vectors will change the position of the hyperplane. These are the points that help us build our SVM
6. Random Forest Regression is basically a number of classifying decision tree on various samples of the dataset. It is similar to concept of averaging; it is used to improve the predictive accuracy of the Decision tree and prevent the model from over fitting

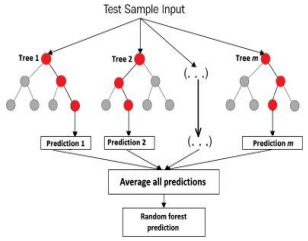

Figure.3.Random Forest Regression

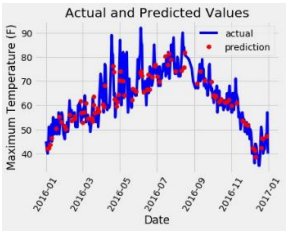

Figure.4.Visual Representation

## VI. CONCLUSION AND FUTURE SCOPE

The systematic process started from data cleaning and processing, missing value, exploratory analysis and finally model building and evaluation. The best accuracy on public test data is taken into account and higher accuracy score for the given test data is implemented in the machine learning model. This application can help to find the Cryptocurrency Market Price. This project will improve that future idea of crypto currencies and it can even improve the market price of the cryptocurrency. In this paper we proposed a machine learning algorithm to find the market price of the given Cryptocurrency and even calculated the accuracy of various different Machine learning model. This application will help the users get more profit and improve their trading ability.

For future works, Show the statistical trend in cryptocurrency for 1 week. Automate this process and show the prediction result in android application or IOS application. Even improve the result using Artificial Intelligence environment. Add more coins and predict its market value.

## VII. ACKNOWLEDGMENT

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