

Comparative Analysis Of Cryptocurrency Price Prediction using Machine Learning

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Abstract— Bitcoin is a digital currency that is well-known for its innovative payment network. It is not controlled by a central structure or bank. This paper plans to precisely anticipate the Bitcoin cost by considering different boundaries that impact the Bitcoin esteem. We found the advantages and disadvantages of bitcoin expectation by social occasion data from different reference papers and applying it continuously. Following the recent boom and bust of cryptocurrency prices, Bitcoin has become increasingly regarded as an investment asset. Although previous studies have used machine learning to predict Bitcoin prices more accurately, few have focused on the feasibility of using different modelling strategies. In this paper, We attempted to accurately forecast the Bitcoin price by taking into account several aspects that influence the Bitcoin value. We aimed to analyse and detect daily fluctuations in the Bitcoin market as well as get insight into the most relevant characteristics surrounding Bitcoin pricing in our work. We will make the most accurate daily price prediction possible.

Keywords— Bitcoin, cryptocurrency, Machine learning, prediction, decision tree, linear regression, svm, Knn.

1. INTRODUCTION

The value of Bitcoin fluctuates in the same way that the value of any other stock does. Many algorithms are used to forecast stock market prices using stock market data. However, the factors influencing Bitcoin differ. As a result, forecasting the value of Bitcoin is necessary in order to make sound investment decisions. Unlike the stock market, the price of Bitcoin is unaffected by business events or intervening government authorities. As a result, we believe that using machine learning technology to estimate the price of Bitcoin is vital. Bitcoin is an electronic cash that is involved from one side of the planet to the other for cutting edge portions and as a hypothesis. Bitcoin is decentralised, which means it is not owned by a single entity. Bitcoin transactions are straightforward since they are not tied to a certain jurisdiction. Investing in bitcoin is possible through a number of "bitcoin exchanges" or marketplaces. These can be utilized to trade Bitcoins in an assortment of different monetary standards. Mt Gox is the fundamental Bitcoin exchange. Bitcoins are put away in a computerized wallet, which works similarly as a virtual ledger. The record, everything being equal, as well as the timestamp information, is put away on a site called Blockchain. Each record on a blockchain is alluded to as a square. A pointer to the past square of data is associated with each square. The data put away on the blockchain is encoded. During exchanges, simply the client's wallet ID is unveiled, not the client's name. Many investigations utilized web-based entertainment AI calculations to anticipate the cost of bitcoin on the financial exchange. We predicted the bitcoin price in our project utilising svm, decision tree, linear regression, knn machine learning methods. Our goal is to evaluate the effectiveness of four algorithms.

Our Contributions

In our exploration, we applied the most modern AI calculations to anticipate the cost of a Bitcoin with more noteworthy precision.

I.

2. LITERATURE REVIEW

A significant measure of writing on Bitcoin cost forecast has previously been distributed and is accessible to the overall population in this area. Lekkala Sreekanth's prediction of Bitcoin utilising Deep Learning in the year 2020 is one such paper. He proposed the SVM model in his work, which stands for support vector machine. The advantage of utilizing this model is that it functions admirably when the quantity of aspects surpasses the quantity of tests, yet the drawback is that it is slow.

In 2019, Yogeshwaran delivered a paper named Bitcoin Price Prediction Using Deep Learning. He involved CNN and RNN in his article.

The benefit of utilising this model is that it can quickly determine pricing for vast datasets. The disadvantage is that, both forward and backward, convolution is a substantially slower operation than, example, maxpool. Shreya Maji's "Bitcoin Price Prediction Using Machine Learning" is one of the articles in which she discusses Bayesian Regression and GLM.

The advantage of adopting this algorithm is that it works by utilising the coinmarkup cap to anticipate the outcome, and the negative she highlighted in her paper is that filtering the data takes a long time.

3. SYSTEM REQUIREMENTS:

Software Requirements	Hardware Requirements
Jupyter notebook, the data set	
Libraries: Scipy, pandas, NumPy, sklearn, and Matplotlib.	

4. PROPOSED METHOD

In this paper we have utilized two AI calculations irregular svm, linear regression, decision tree and knn



anticipate the cost.

Our study's dataset was obtained from the Kaggle website. The dataset also has 10 columns and 2991 rows, as can be seen. Open, close, high, low, and volume are all options. A cryptocurrency's open price is the price at which it trades at any given time (start of the day). A cryptocurrency's closure price is the price at which it closes at a certain point in time (end of the day). The volume of a coin is the number of times it changes hands in a given time period (no. of transactions happened in a day). This is the most exorbitant cost of the day. low: the least expensive cost of the day.

1. Support Vector Machine Algorithm:

SVM represents Supervised Machine Learning Algorithm, and it is utilized for order and relapse. It's all the more normally utilized for order, in spite of the fact that it's similarly great for relapse.

Steps:

1. Install the required libraries first.
2. Split the X and Y variables after importing the dataset.
3. Separate the dataset into training and testing sections.
4. For the first time, set up the SVM classifier model.
5. Determining the parameters of the SVM classifier model.
6. Creating forecasts is number six on the list.

2. K-Nearest Neighbour Algorithm:

Knn is a condensing for "k-closest neighbor." It's an AI calculation that is administered. It tends to be utilized to handle issues including arrangement and relapse. The letter 'K' addresses the amount of nearest neighbors to another dark variable that ought not set in stone. Its goal is to figure out what class a new or unknown data point belongs to by locating all of its nearest neighbours. It's a method based on distance.

The stages in the KNN method are as follows:

Stage 1: Settle on the amount of neighbors (K).

Stage 2: Choose the Euclidean distance between K neighbors.

Stage 3: Utilizing the got Euclidean distance, find the K closest neighbors.

Stage 4: Count the amount of information of interest in each class among these k neighbors.

Stage 5: Appoint the new data centers to the arrangement with the best number of neighbors.

Stage 6: Our model is prepared.

3. Linear Regression Algorithm:

A supervised learning machine learning approach is linear regression. Regression analysis is performed by it.

It's a popular tool for forecasting and determining variable correlations. Different relapse models take a gander at various sorts of reliant and autonomous variable connections, as well as various quantities of free factors.

A mathematical approach called linear regression is used to estimate the value of a dependent variable (y) based on the worth of an autonomous variable (x). A straight connection between x (information) and y (yield) is found because of utilizing this relapse procedure (yield). The expression "straight relapse" became far reaching subsequently

4. Decision Tree Algorithm:

A decision tree creates relapse or arrangement models as a tree structure. It separates a dataset into increasingly small lumps over the long run while likewise assembling a decision tree. A tree with leaf hubs and choice hubs is the final product.

Steps:

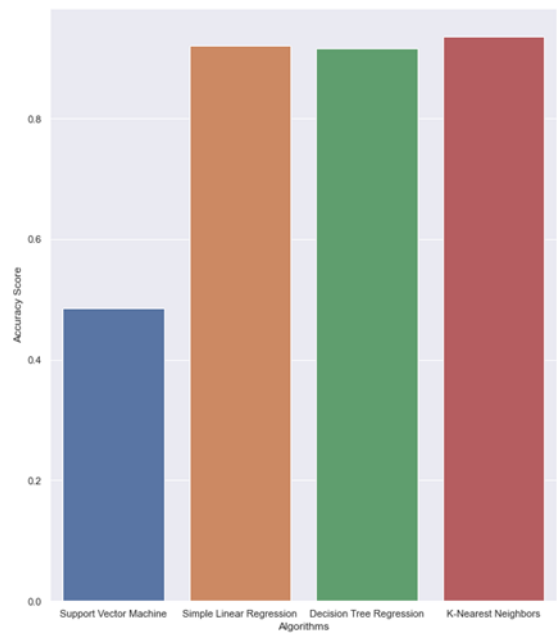
1. The first step is to bring the libraries into the programme.
- 2: Entering data into the programme.
- 3: Using the dataset, create a Training and Test set.
- 4: Train the Decision Tree Regression model on the preparation set.
- 5: Predicting the Results
- 6: Actual and Predicted Values Comparison.

5. RESULTS AND DISCUSSION

We have taken the dataset from the Kaggle. Our dataset contains 7 features open, close, high, low, volume, date and symbol. We have taken close as target variable. We have trained and tested the data. Then we have implemented the algorithms which are SVM, linear regression, decision tree, knn.

```
#accuracy score of SVR
print("Accuracy score of SVR : ",svr_rbf_confidence)
#accuracy score of simple linear regression
print("Accuracy score of simple linear regression : ",reg_confidence)
#accuracy score of decision tree regression
print("Accuracy score of decision tree regression : ",dtreg_confidence)
#accuracy score of knn regression
print("Accuracy score of KNN regression : ",knnreg_confidence)

Accuracy score of SVR : 0.48500510292946897
Accuracy score of simple linear regression : 0.9212752708485761
Accuracy score of decision tree regression : 0.9159561181658946
Accuracy score of KNN regression : 0.936084026083408
```



We have compared all the four algorithms with their accuracy. KNN gave 93% accuracy, linear regression gave 91% accuracy, decision tree gave 91% accuracy and svm gave 48% accuracy. So with this we got to know that KNN algorithm is more efficient for bitcoin price prediction.

6. CONCLUSION

In this paper we talked about how AI calculations used to anticipate the costs of bitcoin with the connected charts which gives us representation of how information is addressed execution of those calculations alongside result. After implementing four algorithms we got to know that the KNN gave the highest accuracy.

7. FUTURE ENHANCEMENTS

Since we can't determine 100% accuracy score for our system model that predicts Bitcoin price. However, achieving a 100 percent accuracy score indicates that our model is being overfitted with data, resulting in performance that has already been trained for it. We can improve on this accuracy by using deep learning algorithms however at the cost of computation expense. We can also use complex Machine Learning models to get better accuracy in prediction of Bitcoin value or price.

In any event, it is necessary to investigate further to work on the accuracy of Machine learning-based expectation models by considering other boundaries in addition to the previous one. The value unpredictability of cryptographic money is influenced and determined by factors like a country's governmental structure, advertising, and market strategy. Other cryptographic types of money, such as wave, ethereum, light coin, and others, were not examined in our analysis. We'll improve the concept by applying it to these cryptographic kinds of money, making it more stable.

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