Bitcoin Price Predictions

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Abstract

Bitcoin is a distributed decentralized cryptocurrency. It is considered a significant advancement in the finance industry in the past century. It is considered important by many experts and many countries have adopted its usage. But with the bitcoin price varying rapidly, there is a need for investors in this field to have a good idea of how the price fluctuates so that they can effectively plan their trade in bitcoin. In this project we have used historical trading data of bitcoin and specifically the closing pricing. Than using linear regression we have tried to predict future closing values.

1 Introduction

Cryptocurrency is a type of digital currency that uses cryptography for security and anti-counterfeiting measures. A defining feature of a cryptocurrency is that it is not issued by any central authority, rendering it theoretically immune to government interference or manipulation. Bitcoin became the first decentralized cryptocurrency in 2009.

Bitcoin is a payment system invented by Satoshi Nakamoto. It was published as open source software in 2009. It is a peer-to-peer system where users can transact directly with each other. Since it has no administrator, it is a distributed decentralized currency. Each of the bitcoin transactions is verified by nodes in the network and then recorded in the public distributed ledger called blockchain. The unit of currency is bitcoin which is valued currently at Rs. 25016 per bitcoin.

The process of adding transaction records to the blockchain is called mining. Bitcoins are created as a reward for payment processing work in which users offer their computing power to verify and record payments into a public ledger. Miners are rewarded with transaction fees and newly created bitcoins.

2 Bitcoin Price Variation

Initially, when bitcoin was introduced, its value was 0.08 US dollar (USD) per bitcoin, almost 10,000 bitcoins for two pizzas. In 2012, the value was 1 USD per bitcoin. The value reached its peak at 1200 USD in 2013. Immediately after this, in early 2014, it fell to nearly 600 USD because of the theft of 850,000 bitcoins (worth 450 million dollars at the time). From around 450 USD in the beginning of January 2016, the value of bitcoin reduced to around 385 USD per bitcoin by mid-January. This was heavily influenced by the withdrawal from Bitcoin of Mike Hearn, one of the lead developers of Bitcoin. Instances like these demonstrate that the fluctuation in the value of bitcoin at any moment can be affected by various factors directly or indirectly.

Some of the factors that are presumed to affect the value of bitcoin are stock market fluctuation, gold rate, exchange rates, and regulations/laws in countries. In the past, the value of bitcoin seems to have fluctuated with news related to Bitcoin, emergence of other cryptocurrencies, and even by the opinion of highly influential figures on social networking sites. It has been observed that the value of bitcoin

varies widely in the wake of natural disasters, terror attacks and disease outbreaks. The value of bitcoin is also observed to depend on the network statistics itself, like the number of miners present and the number of merchants that are part of the network.

3 Data Pre-processing

All the data is cleaned to remove any duplicates and extraneous entries. Data was normalized using the MIN MAX Normalizer, transforming the data into new scores with a mean of 0 and a standard deviation of 1. This is done for the 'Open' column in our datasets.

4 Linear Regression

Linear regression attempts to model the relationship between two variables by fitting a linear equation to observed data. By using the below equation:

$$y_i = \beta_0 1 + \beta_1 x_{i1} + \cdots + \beta_p x_{ip} + \varepsilon_i = \mathbf{x}_i^{\mathsf{T}} \boldsymbol{\beta} + \varepsilon_i, \qquad i = 1, \ldots, n,$$

The method of least-squares has been used to fit a regression line.

With only historical trading data of bitcoin, 256 Opening day datapoints have been used to predict 16 future Opening datapoints at each iteration of the regression. The datapoints range from 4th July 2017 up to 27th March 2018.

In this dataset we have split using 70-30 rule, to get our training and validation data sets.

5 Results

Below is the graph for the predicted opening values against the original opening values. The graph is almost similar with the original graph but there are many gaps in the predicted and original data.

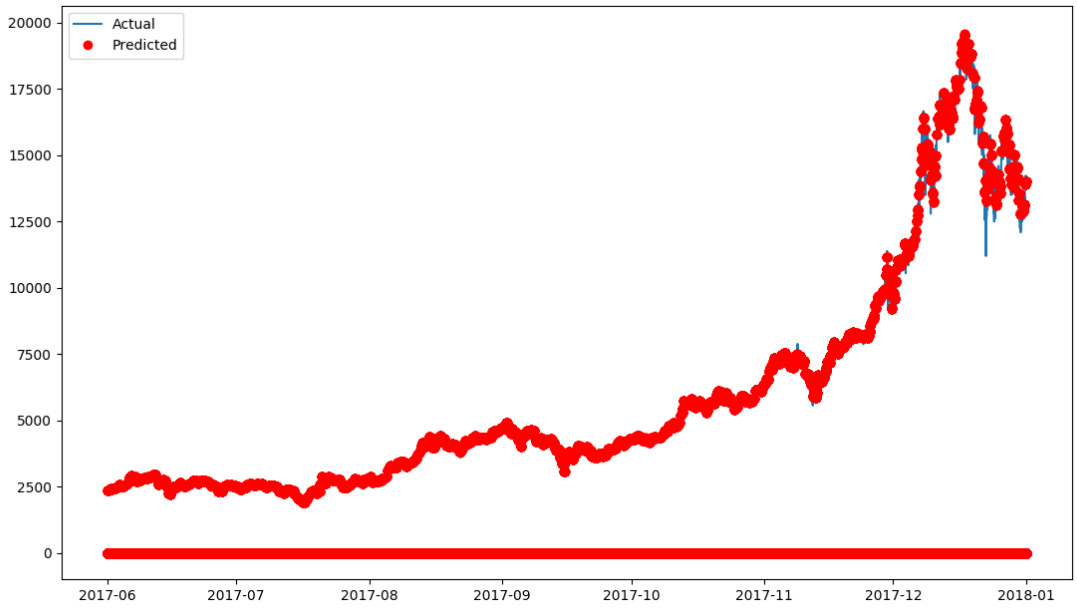

Figure 1: Actual vs Predicted Price graph

6 Conclusion

The prediction is good for small look ahead but worse for large. Using more datapoints and a complex algorithm, further days can be predicted with reduced error points.

7 Reference

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