Prediction of Bitcoin Prices

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Abstract - *In recent years, Bitcoin is the most valuable in the cryptocurrency market. However, prices of Bitcoin have highly fluctuated which make them very difficult to predict. Hence, this research aims to discover the most efficient and highest accuracy model to predict Bitcoin prices from various machine learning algorithms. By using 1-minute interval trading data on the Bitcoin exchange website named bit stamp from January 1, 2012 to January 8, 2018, some different regression models with scikit- learn and Keras libraries had experimented. The best results showed that the Mean Squared Error (MSE) was as low as 0.00002 and the R-Square (R2) was as high as 99.2%. Bit coin is currently a thriving open-source community and payment network, which is currently used by more than 10 million people. As the value of Bit coin punctuates every day, it would be very interesting for investors to predict the Bit coin value but it is not easy to predict*

***Key Words*: Bitcoin, cryptocurrency, machine learning, etc...**

1. INTRODUCTION

Time series prediction is not a new phenomenon. Prediction of mature financial markets such as the stock market has been researched at length. Bitcoin presents an interesting parallel to this as it is a time series prediction problem in a market still in its transient stage. As a result, there is high volatility in the market and this provides an opportunity in terms of prediction. In addition, Bitcoin is the leading crypto currency in the world with adoption growing consistently over time. Due to the open nature of Bitcoin it also poses another paradigm as opposed to traditional financial markets. It operates on a decentralized, peer-to-peer and trustless system in which all transactions are posted to an open ledger

called the Blockchain. This type of transparency is unheard of in other financial markets. Traditional time series prediction methods such as Holt-Winters exponential smoothing models rely on linear assumptions and require data that can be broken down into trend, seasonal and noise to be effective ,This type of methodology is more suitable for a task such as forecasting sales where seasonal effects are present. Due to the lack of seasonality in the Bitcoin market and its high volatility, these methods are not very effective for this task. Given the complexity of the task, deep learning makes for an interesting technological solution based on its performance in similar areas. Tasks such as natural language processing which are also sequential in nature and have shown

promising results . It is used to describe the sequence from one activity to another and it describes the parallel, branched and concurrent flow of the system. The main element of an activity diagram is the activity itself. This type of task uses data of a sequential nature and as a result is similar to a price prediction task. The recurrent neural network (RNN) and the long short term memory (LSTM) flavor of artificial neural networks are favored over the traditional multilayer perceptron (MLP) due to the temporal nature of the more advanced algorithms.

PREDICTION TECHNIQUES

A. Linear regression model

In linear regression is a linear approach to modeling the relationship between a dependent variable and independent variables. The case of linear variable is called simple linear regression [8]. In this paper I am using the linear regression model for relationship between a dependent variable and one or more independent variables.

B. K-Nearest Neighbor

K-means creates k groups from a set of objects so that the members of a group are more similar and based on this data is clustered as normal, stressed or highly stressed. We can compute the distance between two dependent and independent variables using some distance function $d(x,y)$, where x,y are scenarios composed Number of features, such that $x=\{x1,...,xN\}$, $y=\{y1,...,yN\}$. Break the principal third of the information into all conceivable back to back interims of sizes 180s, 360s and 720s. Apply k-implies grouping to recover 100 bunch communities for every interim size, and afterward use test Entropy to limit these down to the 20 best/generally fluctuated and ideally best bunches. Utilize the second arrangement of costs to figure the comparing loads of highlights discovered utilizing the Bayesian relapse strategy. The relapse fills in as pursues. At time t, assess three vectors of past costs of various time interims (180s, 360s and 720s). For each time interim, ascertain the comparability between these vectors and our 20 best k-means designs with their realized value hop, to locate the probabilistic value change dp. Compute the loads, for each component utilizing a Differential Advancement enhancement work. . The third arrangement of costs is utilized to assess the calculation, by running the equivalent Bayesian relapse to assess highlights, and consolidating those with the loads determined in stage 2

A. Naïve Bayes

Naïve Bayes techniques are a great deal of coordinated learning figuring's reliant on applying Bayes' speculation with the "honest" supposition of opportunity between each pair of features . Overlooking their plainly over-improved suppositions, guiltless Bayes classifiers have worked very well in some genuine conditions. They require a limited measure of preparing information to survey the critical parameters. Honest Bayes understudies and classifiers can be unbelievably speedy appeared differently in relation to progressively present day systems. The decoupling of the class prohibitive component dispersals suggests that each movement can be uninhibitedly evaluated as a one dimensional scattering. This along these lines decreases issues originating from the scourge of dimensionality. We used the execution gave by Scikit-make sense of how to this.

C. Random Forests
Random Forests get the outfit learning framework where distinctive weak understudies are merged to make a strong understudy. It is a meta estimator that fits various decision tree classifiers on various sub-primer of the enlightening assortment and use averaging to improve the farsighted accuracy and authority over fitting. The sub-test size is reliably proportional to the rule data test . We used the use gave by Scikit-see how to this. Build three-time arrangement informational indexes for 30, 60, and 120 minutes (180, 360, 720 information focuses individually) going before the present information point at all focuses in time separately. Run GLM/Random Forest on each of the two time series data sets separately. 3) We get two separate linear models: M1, M2 corresponding to each of the data sets. From M1, we can predict the price change at t, denoted ΔP1. Similarly, we have ΔP2 for M2.

PROPOSED METHODOLOGY

A. Least Absolute shrinkage selection operator (LASSO):

In estimations and AI, rope (least absolute shrinkage selection operator or LASSO) is a lose the faith assessment framework that performs both variable choice and regularization so as to refresh the check exactness and interpretability of the legitimate model it produces. Diverse tie assortments have been made so as to fix certain constraints of the fundamental strategy and to make the system dynamically huge for unequivocal issues . In every practical sense these emphasis on as for or using various sorts of conditions among the co variates. Adaptable net regularization fuses an extra edge lose the faith like order which improves execution when the measure of markers is more noteworthy than the model size, enables the technique to pick ardently related factors together, and improves generally want accuracy.

B. Decision Tree

This is one of my preferred calculation and I use it oftentimes. It is a kind of directed learning calculation that is for the most part utilized for order issues. Shockingly, it works for both clear cut and consistent ward factors. In this calculation, we split the populace into at least two homogeneous sets. This is done dependent on most huge properties/autonomous factors to make as particular gatherings as could reasonably be expected.

C. KNN (k- Nearest Neighbors)

It very well may be utilized for both order and relapse issues. Be that as it may, it is all the more generally utilized in characterization issues in the business . K nearest neighbors is a straight forward calculation that stores every single accessible case and arranges new cases by a lion's share vote of its k neighbors. The case being allotted to the class is generally normal among its K closest

neighbors estimated by a separation work. Initial three capacities are utilized for constant capacity and fourth one (Hamming) for clear cut factors. On the off chance that K = 1, at that point the case is basically relegated to the class of its closest neighbor. Now and again, picking K ends up being a test while performing KNN displaying.

2. LITERATURE SURVEY

Deals with daily time series data, 10-minute and 10-second time-interval data. They have created three time series data sets for 30, 60 and 120 minutes followed by [1] performing GLM/Random Forest on the datasets which produces three linear models. These three models are linearly combined to predict the price of Bit coin. According to the author is analyzing what has been done to predict the U.S. stock market.[2] The conclusion of his work is the mean square error of the prediction network was as large as the standard deviation of the excess return. However, the author is providing evidence that several basic financial and economic factors have predictive power for the market excess return. Instead of directly forecasting the future price of the stock, [3] the authors predict trend of the stock. The trend can be considered as a pattern. They perform both short term predictions (day or week predictions) and also long-term predictions (months). They found that the latter produced better results with 79% accuracy. Another interesting approach the paper of the network. Based on the predicted output the performance evaluation algorithm.

Table -1: Bitcoin Accuracy

Open	Close	Low	Predicted-High
15123.7	14424	14595.4	16109.1906
16476.2	14208.2	15170.1	17790.0436
6777.77	6758.72	7078.5	7556.4003

A comparison between Multilayer Perceptron (MLP) and Non-linear autoregressive [4] exogenous (NARX) model is made. They conclude that MLP can also be used for stock market prediction even though it does not outperform NARX model in price prediction. The authors made use of

MATLAB's neural network toolbox to build and evaluate the performance of the network. Instead of directly focusing on the future price of the stock, [5] the authors predict daily trends of the stock. The trends can be considered as a pattern. It performs both short term predictions such as day or week predictions and also long-term predictions in terms of months. It later produced better results with 79% accuracy. Analyzing what kind of implements has been done to predict the U.S. stock market. The conclusion [6] of work is the mean square error of the prediction network as large as the standard deviation in excess return. Regardless, the author is providing evidence that several basic economic and financial factors have predictive power for the market in excess return.

3. Proposed System

It is also important to be able to predict Bitcoin price changes. Stock market prediction has grown over decades using daily data and accessible high frequency data. However, research on how to predict Bitcoin price is still lacking. Previous studies have predicted Bitcoin price in two ways: empirical analysis and analysis of robust machine learning algorithms. Machine learning algorithms have been widely applied to make accurate predictions in many areas, including product manufacturing and finance such algorithms can be replicate for the Bitcoin market, even in the world of crypto currency. Though more methods about feature selection and measurements are leveraged, previous related works have depended on the researchers' domain knowledge and lack a comprehensive consideration of feature dimensions. The bitcoin network is a peer-to-peer payment network that operates on a cryptographic protocol. Users send and receive bitcoins, the units of currency, by broadcasting digitally signed messages to the network using bitcoin crypto currency wallet software. Transactions are recorded into a distributed, replicated public database known as the blockchain, with consensus achieved by a proof-of-work system called mining. The network requires minimal structure to share transactions. An ad hoc decentralized network of volunteers is sufficient. Messages are broadcast on a best effort rejoin the network.
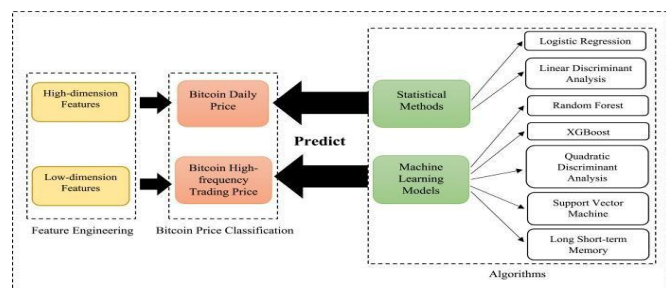

Fig-3.1: Proposal Work

4. RESULT

The result an clearly revels that to error increase write to member of in advance to proposed system better prediction for the 00.50. Stock development in overall performance

measure. SVR & LSSVR solves linear equations instead of a quadratic programming problem. It is preferred for large-scale regression problems that demand fast computation.

Fig -4.1: Day Chart

Calculated the value of Bitcoin :-

1. (Invested Value) x (Present Market Value) = (Gross Network Value)

2. (Gross Network Value)/ (25 Years) = (Blockchain Annual Dividend Value)

3. (Blockchain Annual Dividend Value) x (Par Value) = Forecast Value in y Years [where y = (GNV/BADV)]

Fig -4.2: Hourly Based (Updated March.19)

The proposed system needs to predict Bit coin prices with more accurate results.

5. CONCLUSION

The best accuracy but takes calculated time more than Huber regression. However, setting parameters and the total number of datasets can affect the results. In addition, the selected the existing system for Bit coin price detection uses 24-hour time series. After establishing the learning framework and completing the normalization, we intend to use the two methods mentioned above and choose the best method to solve the Bitcoin prediction problem. A group consist of 3 members we have perform 6 papers for the literature review and we have successful arrived at problem statement and result must be feasible.

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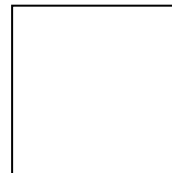
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