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ANALYSIS OF CRYPTOCURRENCY PRICES USING ARTIFICIAL INTELLIGENCE

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Abstract: Cryptocurrency becomes more popular and merchant accept it, it is playing an increasingly vital role in reshaping the financial system. While many people are forming investments in Cryptocurrency, the vital features, distrust, the predictability of Cryptocurrency are quiet basically unknown, which dramatically risk the investments. It's a business to strain to conclude the procurators that impact the value formation. Here we apply advanced artificial intelligence frameworks of completely connected Artificial Neural Network (ANN) and Long Short Term Memory (LSTM) periodical Neural Network to analyze the price dynamics of Bitcoin, Ethereum, and Ripple. We find that ANN tends to calculate more on long- term chronicle while LSTM tends to calculate more on short- term dynamics, which indicate the effectiveness of LSTM to exploit useful data hidden in literal memory is stronger than ANN. still, given enough historical data ANN can attain an analogous accurateness equated with LSTM. This reverie provides a unique demo that Cryptocurrency market price is predictable. Still, the explanation of the predictability could differ depending on the complexion of the detailed machine- learning model.

KEYWORDS: Artificial Intelligence, ANN, LSTM, Block Chain.

I. INTRODUCTION

Cryptocurrency is the peer- to- peer digital money and payment system that exist online via a bridled algorithm. When a miner clefts an algorithm to record a block of trades to public ledger termed blockchain and the cryptocurrency is created when the block is appended to the blockchain. It allows people to keep and send through encryption protocol and distributed network. Among numerous features of bitcoin, the most affecting one is decentralization that it can take off the involvement of traditional financial sectors and financial authorities effectively due to its blockchain network features.

In addition, the electronic payment system of Bitcoin is based on cryptographic evidence preferably than the trust between each other as its transaction history cannot be changed unless redoing all evidence of work of all blockchain, which play a overcritical part of being a trust go-between, with a controllable anonymity scheme and this can be extensively exercised in reality such as noting charitable contribution to avoid corruption. Now a days, steeping in cryptocurrencies, like Bitcoin, is one of the effective ways of earning money.

Significant efforts have been framed to analyse and predict the tendencies of traditional financial markets particularly the stock market still, predicting cryptocurrencies market prices is still at a primal stage. Compared to these stock price prediction miniatures, conventional time series strategies aren't veritably useful as cryptocurrencies aren't precisely the identical with stocks but can be supposed as a reciprocal stuff of existing currency system with keen fluctuations features.

We aim to use artificial intelligence modeling frame works to decide and predict the most popularized cryptocurrencies price dynamic. Here we use artificial intelligence frame, Long Short Term Memory to analyse and predict the price dynamics of Bitcoin, Ethereum, Ripple and numerous further cryptocurrencies. Exploiting Long Short Term Memory (LSTM) which will enable us to generate a prediction model for forecasting the prices of all cryptocurrencies. We'd also be degrading the noise in the datasets for better effectiveness of model and delicacy.

II. LITERATURE SURVEY:

In[1] Neural Networks for economic prediction. The case of IBM day-to-day stock responses report is presented of some outcomes Halbert White, author compendiums are presented to neural- network modeling and learning techniques. A report is staged of some results of an proceeding design using neural-network modeling and learning techniques to search for and decode nonlinear discrepancies in asset price movements. The penman focuses on the case of IBM frequent stock daily returns. Having to deal with the salient features of profitable data highlights the part to be played by statistical inference and requires variations to standard learning techniques which may establish actionable in different surrounds.

In[2] Formation of Cryptocurrency Value, A case study that produced a cost- of- product model for cherishing Bitcoin Adam, Hayes. Then it aims to identify the probable source(s) of value that Cryptocurrencies display on the market using empirical cross- sectional data examining 66 of the most exploited analogous' coins'. A regression model was estimated that points to 3 main motorists of Cryptocurrency value the problem in' mining' for coins; the rate of unit product; and the cryptographic algorithm retained. This quantum to relative differences within the cost of product of 1 coin over another at the circumference, holding all fresh equal. Bitcoin-denominated relative prices were used, avoiding much of the price volatility companied with the dollar exchange rate. The affecting regression model can be used to more understand the drivers of relative value observed in the imperative area of Cryptocurrencies. A cost-of-product model is suggested for pricing Bitcoin using the study below, with electricity serving as the main input. This theoretical model produces useful results for both an individual patron, by setting breakeven points to start and stop product, and for the Bitcoin exchange rate on a macro position. Bitcoin product seems to act a competitive commodity request; in thesis miners will produce until their frame costs equal their frame product.

In[3] Predicting the Transactions of bitcoins authors, alex greaves, benjamin au. The most popular cryptocurrency in the world, Bitcoin enables users to deal safely and discreetly over the Internet. Consumers, corporations, investors, and speculators have all recently been interested in the Bitcoin ecosystem. While a lot of study has been done to examine the architecture of the Bitcoin network, less has been done to examine how the network affects the price of Bitcoin as a whole. In this study, we look into the ability of blockchain network-based characteristics to forecast changes in Bitcoin price. With the use of machine learning optimisation and feature engineering based on blockchain networks, we achieve an up-down Bitcoin price movement categorization accuracy of about 55%.

In(4) Prediction of bitcoin exchange rate to american dollar using artificial neural network methods penmen Arief Radityo, Qorib Munajat, Indra Budi cryptocurrency trade is currently a popularized type of investment. Cryptocurrency market has been acted analogous to foreign exchange and stock market. However, because of its volatility, there's a absence for a prediction tool for investors to support them consider investment decisions for cryptocurrency trade. Now a days, artificial neural network (ANN) computing based tools are generally operated in stock and foreign exchange market predictions.

ANN predictor has been the subject of significant research on the case studies of stocks and foreign exchange, but not cryptocurrencies. thus, this exploration studied variety of ANN method to predict the request value of one of the most habituated cryptocurrency, bitcoin. the ANN methods will be used to elaborate model to predict the close value of bitcoin in the coming day (coming day prediction). This study compares four ANN styles, videlicet back propagation neural network BPNN), inheritable algorithm neural network (GANN), inheritable algorithm back propagation neural network (gabpnn), and neuro evolution of accelerating topologies (tidy) the methods are estimated based on accuracy and complexity.

In[5] A Particle Swarm Optimization (PSO)–Based Optimized Support Vector Machine (SVM) For Cryptocurrency Forecasting Nor Azizah Hitam, Amelia Ritahani Ismail, and Faisal Saeed are the authors. It focuses on the functionality of a six cryptocurrency Optimized SVM-PSO. The review of the cryptocurrency industry and the different types of cryptocurrencies on the financial market are covered at the outset. The results and performance metrics for all classifiers over the chosen coin are shown. Results indicate that SVM-PSO performed better than other classifiers, with an accuracy rate of 97%. It then supports the notion that the population and calibre of the training dataset also influence the accuracy of forecasting results. The prior SVM and optimized SVM-PSO results were then compared and contrasted. SVM-PSO exhibits equivalent results in the comparison analysis performed in the following section.

III. ARTIFICIAL NEURAL NETWORK (ANN)

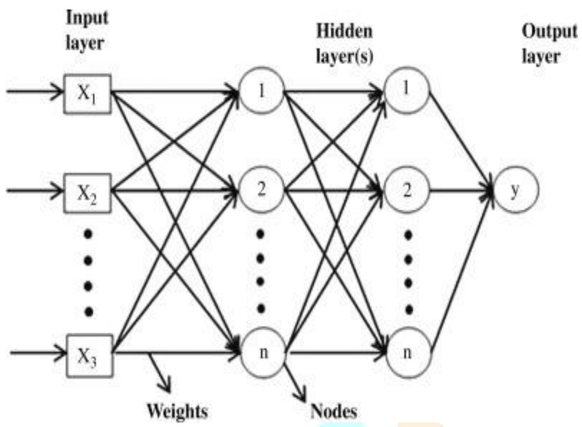
Biological neural networks serve as the foundation for ANN architecture's structure and operation. ANN also consists of neurons, which are arranged in multiple layers, much like the neurons in the brain. A common neural network called a "feed forward neural network" has three layers: an output layer that provides the answer to the problem, an output layer that receives external data for pattern recognition, and a hidden layer that serves as an intermediary layer between the two. Through acyclic arcs, the adjacent neurons in the input layer and output layer are connected.

A training algorithm is used by the ANN to learn the datasets, and depending on the error rate between the target and actual output, it updates the neuron weights. For the most part, ANN employs the back propagation method as a learning algorithm to become familiar with the datasets. ANNs are artificial neural networks, which are deep learning techniques. ANN was developed as a means of simulating how the human brain works. Biological neural networks and artificial neural networks operate in remarkably similar ways, despite certain differences. Only numerical and structured data are accepted by the ANN algorithm.

The input layer, the hidden layer (or layers), and the output layer all make up the network architecture. They are frequently referred to as MLPs (Multi-Layer Perceptrons) because of their many layers. The hidden layer may be viewed as a "distillation layer," which takes some of the most significant patterns from the inputs and passes them on to the following layer for more analysis.

By selecting only the most crucial information from the inputs and ignoring the redundant information, it speeds up and enhances the network's performance

The general structure of ANN



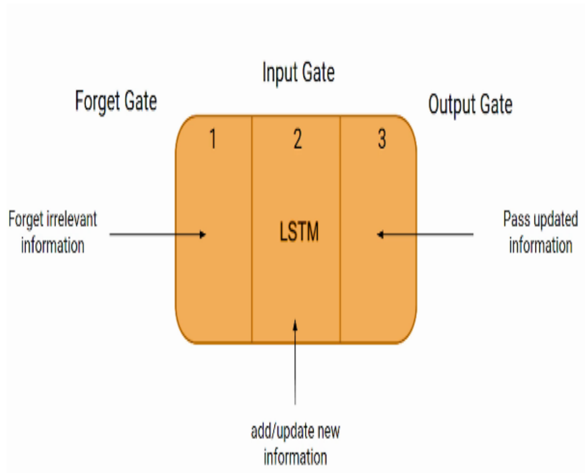
The activation function is important for two reasons: It allows you to turn on your computer first. The existence of non-linear interactions between the inputs is captured by this model. It aids in the transformation of the input to more useful output.

A good model requires identifying the "optimal values of weights" that reduce prediction error. By transforming ANN into a learning algorithm that learns from errors, the "back propagation algorithm" accomplishes this. The optimization strategy measures prediction errors by using a "gradient descent" method. Small changes in W are explored in order to obtain the ideal value, and the effects on prediction errors are looked at. Since additional W changes do not lessen errors, those W values are ultimately selected as ideal.

LONG SHORT-TERM MEMORY (LSTM)

Information can endure thanks to the deep learning, sequential neural network known as Long Short-Term Memory Networks. It is a specific variety of recurrent neural network that can address the vanishing gradient issue that RNNs encounter. Hochreiter and Schmidhuber created LSTM to address the issue with conventional rnns and machine learning techniques. Python's Keras package may be used to implement LSTM. Due to the vanishing gradient, RNN have the drawback of being unable to remember long-term dependencies. Long-term dependence issues are specifically avoided while designing LSTMs.

In the previous part, we discovered that long short-term memory addresses the RNN's vanishing gradient problem. In this section, we will explore how it does so by understanding the LSTM's architectural design. LSTM functions quite similarly to an RNN cell at a high level. The LSTM network's internal operation is seen below. As seen in the figure below, the LSTM network design is composed of three sections, each of which serves a distinct purpose.



IV. METHODOLOGY

EXISTING SYSTEM

A few researches have been working to comprehend the cryptocurrency time series and develop statistical models to replicate and forecast price movements, despite the fact that there are currently little efforts on cryptocurrency analysis and prediction. All models built so far did not allow for operating on sequence data. Fortunately, a special class of Neural Network models known as Recurrent Neural Networks (RNN) is just for this purpose. Their prediction algorithm uses random forests and binomial logistic regression classifiers, and its accuracy in foretelling the price of bitcoin is about 55%. While more and more individuals are investing in cryptocurrencies, most investors are unable to benefit from these investments because they are unaware of the dynamics of cryptocurrencies and the important variables that affect the trends of bitcoins.

DRAWBACKS

We may become sensible investors by increasing people's awareness of important variables. Although market prediction is demanding for its complex nature, the dynamics are predictable and understandable to some degree. Lack of capacity to recognize long-term dependencies in a sequence is a severe drawback of RNNs.

PROPOSED SYSTEM

Among many features of bitcoin, the most impressive one is decentralization that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its block chain network features.

In addition, the electronic payment system of Bitcoin is based on cryptography proof than the trust between each other as its transaction history cannot be changed unless redoing all proof of work of all block chain, which play a critical role of being a trust intermediary and this can be widely used in reality such as recording charitable contribution to avoid corruption.

The proposed model will use an advanced artificial intelligence frame that comprises of completely connected Artificial Neural Networks (ANN) and Short-Term Memory (LSTM) to study the request dynamics of crypto currencies. Among ANN and LSTM, ANN will analyze more effectively for long term history, LSTM is for short term dynamics. LSTM is more useful than ANN for hidden historical memory data analysis. With this, we can more accurately estimate the price of the cryptocurrency market.

ADVANTAGES OF PROPOSED SYSTEM

The bitcoin has introduced the controllable anonymity scheme, and this enhances users' safety and anonymity by using this technology, for instance, we may use this feature of Blockchain to create identification cards that not only safeguard our privacy but also serve to confirm our identity. With the help of this we easily predict the Cryptocurrency market price. Obtaining more thorough analysis in a short amount of time.

V. ARTIFICIAL INTELLIGENCE

The application of advanced digital, smart technologies, robotic systems, new materials and design techniques, creation of large data processing systems, computer-aided learning and artificial intelligence (AI) are relevant for various fields of science and technology, including human space projects. Some technology concepts and pilot systems based on the AI (3-D computer vision, automated systems for planning and evaluating the activities of cosmonauts, inquiry and communications system) were developed in the industry over several decades.

VI. DATA SETS

Datasets are taken from Kaggle, Users can browse the Kaggle repository to find interesting datasets and download them for their own projects. They can also use the Kaggle repository to publish their own datasets, making them available to other users around the world. Kaggle provides tools to help users manage their datasets, including version control, data preview, and data cleaning.

Kaggle is a platform for data scientists, machine learning engineers, and researchers to share, collaborate, and compete on data-driven projects. Kaggle provides a repository for users to publish their work and datasets, allowing others to access, download, and analyze the data.

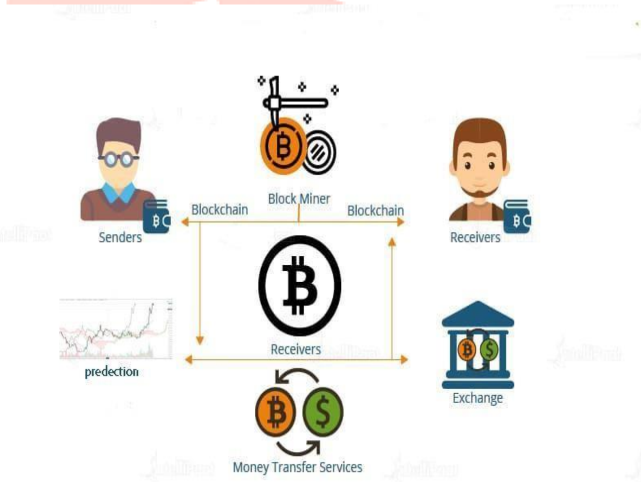
The Kaggle repository is a collection of datasets and code published by Kaggle users. It includes over 35,000 datasets, ranging from small and simple to large and complex, covering a wide range of domains and industries, such as finance, healthcare, retail, and more.

SAMPLE DATASET:

DATE	OPEN	HIGH	LOW	CLOSE	VOLUME	OPEN INT
01-02-2011	46.39	46.81	46.39	46.79	437	0
02-02-2011	47.06	47.10	46.98	46.98	1095	0
04-02-2011	47.81	48.78	47.81	48.78	20288	0
07-02-2011	48.98	49.42	48.98	49.28	7154	0
08-02-2011	48.91	49.19	48.90	49.19	6613	0
09-02-2011	49.26	49.55	49.07	49.22	44920	0
10-02-2011	49.06	49.76	49.02	49.53	18874	0
11-02-2011	49.80	50.33	49.80	50.30	4375	0
14-02-2011	50.51	50.53	50.32	50.32	5475	0
15-02-2011	50.24	50.24	49.80	49.83	5985	0
16-02-2011	50.01	50.26	49.87	50.18	17757	0

VII. SYSTEM ARCHITECTURE

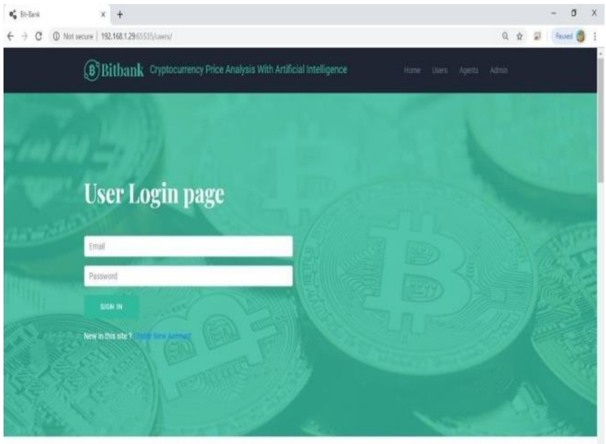
The block diagram is often used for a higher level, less detailed exposition targeted at comprehending overarching principles rather than implementation specifics.



Block Diagram

VIII. TEST CASES

The goal of testing is to find flaws. Testing is the practice of attempting to find every possible flaw or vulnerability in a work product. It enables the testing of components, sub-assemblies, assemblies, and/or full products. It is the process of testing software to ensure that it satisfies its requirements and meets user expectations and does not fail in an undesirable way. There are several sorts of tests. Each test type is designed to fulfill a unique testing requirement.

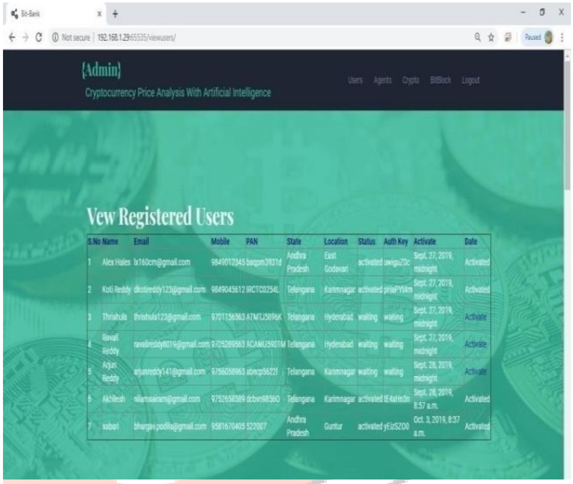


User Login Page

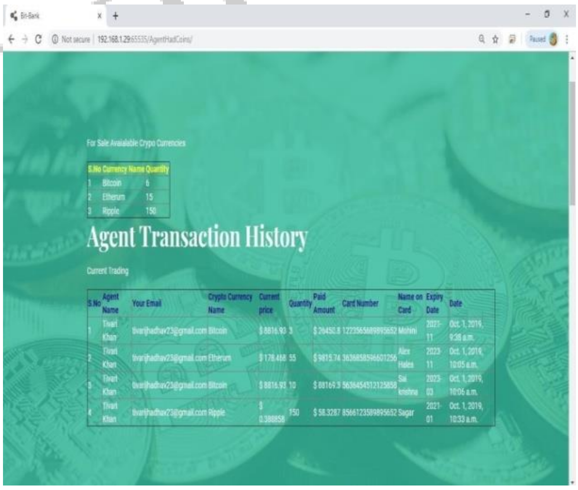
The test provides inputs and responds to outputs without considering how the software works.

S.No	Test Case	Excepted Result	Result	Remarks (If Fails)
1	User registered	If user registration is successful.	Pass	If user is not registered .
2	Agent registered	If agent registration is successful.	Pass	If agent is not registered .
3	Admin	User rights will be accepted here.	Pass	If user is not registered .
4	Admin	Agent rights will be accepted here.	Pass	If agent is not registered .
5	User login	If user name and password is correct then it will getting valid page.	Pass	If user name or password is not correct.
6	Agent login	If agent name and password is correct then it will getting valid page.	Pass	If agent name or password is not correct.
7	Agent buying crypto currency from Admin	If agent is correct then it will getting valid page.	Pass	If sale crypto currencies are not available.
8	User buying crypto currency from Agent	If user is correct then it will getting valid page.	Pass	If sale crypto currencies are not available.

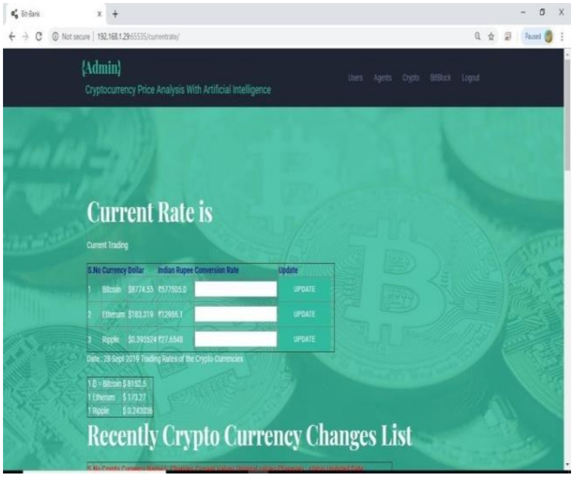
Test Cases



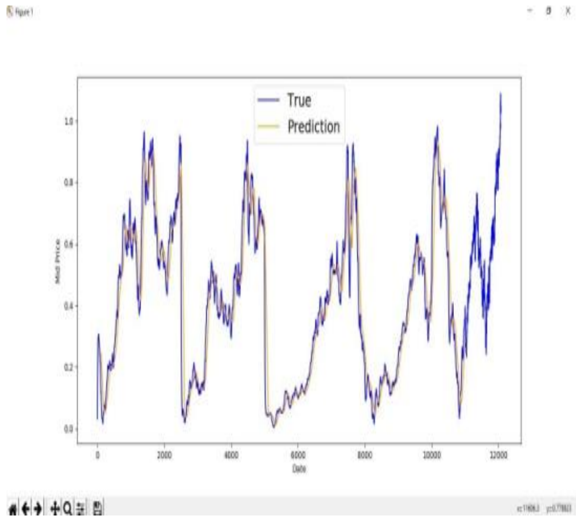
Admin Activate Users



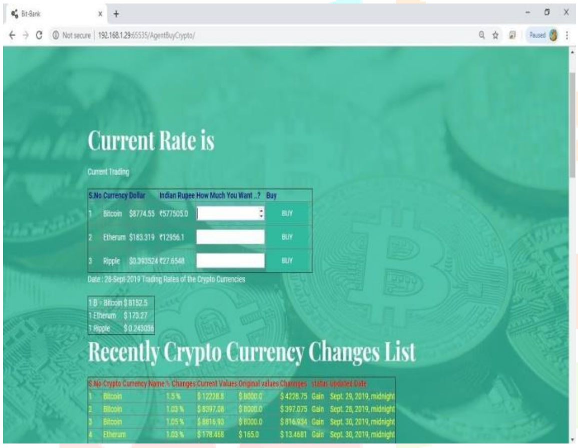
Agent Transaction History



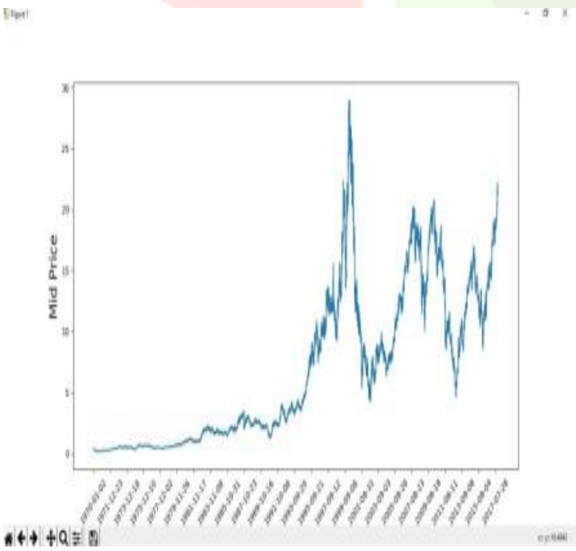
Current Price and Update



True Predictions



Agent Buying Crypto Coins



Dataset Analysis

IX. CONCLUSION

Cryptocurrency, such as Bitcoin, has established itself as the decentralized leader. Following Bitcoin, a slew of other cryptocurrencies emerged, including Ethereum and Ripple. Many individuals keep them as a kind of speculation due to the enormous unpredictability in their value. As a result, understanding the underlying characteristics and predictability of various cryptocurrencies is vital. In this study, we analyse and anticipate Bitcoin price movements using two unique artificial intelligence frameworks: fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM), Ethereum, and Ripple.

We demonstrated that, despite their differences in underlying structures, the ANN and LSTM models are similar and perform quite well in price prediction. The impact of historical memory on model prediction is then investigated further. We discover that ANN relies more on long-term history, whereas LSTM relies more on short-term dynamics, indicating that LSTM is more efficient than ANN in utilizing relevant information concealed in historical memory.This study is a one-of-a-kind showing that the cryptocurrency market price is predictable. However, depending on the nature of the underlying machine-learning model, the rationale for predictability may differ.

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