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CRYPTOCURRENCY PRICE ANALYSIS WITH ARTIFICIAL INTELLIGENCE

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ABSTRACT

Crypto currency is becoming more important in changing the financial system as its popularity and merchant acceptance grow. While many people are investing in bitcoin, its dynamical properties, volatility, and predictability are still largely understood, placing investments at risk. It's a matter of trying to understand the factors that drive the creation of value. We use sophisticated artificial intelligence frameworks of fully connected Artificial Neural Network (ANN) and Long Short-Term Memory (LSTM) Recurrent Neural Network to analyse the price dynamics of Bitcoin, Etherum, and Ripple. We observed that ANN is more reliant on long-term history, but LSTM is more reliant on short-term dynamics, meaning that LSTM is more efficient than ANN at retrieving important information from historical memory. When given enough historical data, however, ANN may be able to match the accuracy of LSTM. This is the first study to prove that bitcoin prices can be forecast. The argument for predictability, however, may vary depending on the type of the machine-learning model in issue.

Key words:ANN ; LSTM ; Cryptocurrency price prediction ; neural network

1. INTRODUCTION

Cryptocurrency is a peer-to-peer digital money and payment system that uses a computer algorithm to function via the internet. The cryptocurrency is created when a miner violates an algorithm to add a block of transactions to a public record known as the blockchain. Individuals may store and transit data using an encryption system and a dispersed network. Mining, which is both necessary and competitive, is crucial to the bitcoin system. The miner with the highest processing power has a better chance of finding a new currency than the miner with the least processing power. With a market value of more than $ 7 billion in 2014 and a massive increase to $ 29 billion in 2017, Bitcoin is the first and most popular digital currency. Bitcoin was established in 2008 by Satoshi Nakamoto. The

most astounding aspect of bitcoin is its decentralisation, which, because to its blockchain network characteristics, may effectively eradicate the power of traditional financial sectors and monetary authorities. Furthermore, Bitcoin's electronic payment system is based on cryptographic proof rather than mutual trust, because its transaction history cannot be changed without redoing all proofs of work on all blockchains, which serve as a critical trust intermediary and can be widely used in practise, such as recording charitable contributions to avoid corruption. Furthermore, bitcoin provided a regulated anonymity mechanism, enhancing the safety and privacy of users. This feature of blockchain, for example, might be used to build identification cards that guarantee our privacy while simultaneously verifying our identity. Investing in cryptocurrencies like Bitcoin has become one of the most efficient ways to gain money. Bitcoin, for example, rose from a low of 963 USD on January 1st to a high of 19186 USD on December 17th, before completing the year at 9475 USD. As a consequence, in 2017, the rate of return on bitcoin investment was over 880 percent, which is a startling and unexpected outcome for most investors. While an increasing number of people are investing in cryptocurrency, the bulk of them will be unable to profit because they are uninformed of the dynamics of cryptocurrencies and the key factors that influence bitcoin movements. As a consequence, boosting people's awareness of key features may help us become more knowledgeable investors. Although market prediction is difficult owing to its complexity, the dynamics are predictable and understandable to a degree. When bitcoin becomes scarce, for example, its sellers will boost its price because investors who regard bitcoin as a good investment opportunity will be eager to pay for it. Furthermore, some external factors, such as political difficulties, might easily affect bitcoin's price. There have been a few studies aimed at understanding Cryptocurrency time series and building statistical models to reproduce and predict price dynamics, despite the fact that few studies have been aimed at understanding Cryptocurrency time series and building statistical models to reproduce and predict price dynamics. Madan et al., for example, collected bitcoin values at time periods of 0.5, 1, and 2 hours and merged them with bitcoin's underlying technology, the blockchain network. Random forests and binomial logistic regression classifiers are used in their prediction method, and the model's accuracy in projecting bitcoin's price is about 55%. Shah et al. used Bayesian regression and high frequency (10-second) price data to improve their bitcoin trading method. Their models have also proven to be quite successful. Using two sets of inputs: the opening, minimum, maximum, and closing price, as well as the Moving Average of both short (5,10,20 days) and long (100, 200 days) windows, an MLP-based prediction model was developed to anticipate the next day price of bitcoin. Their model was found to be accurate to within 5% of the time during validation. Many academic research on exchange rate forecasting have been done, including Meese and Rogoff's (1983, 1988) monetary and portfolio balance models. Despite major efforts to analyse and forecast the movements of traditional financial markets, notably the stock market, predicting the prices of cryptocurrencies is still in its infancy. Because cryptocurrencies are not equivalent to stocks, traditional time series techniques are not as successful as these stock price prediction models. Instead, cryptocurrencies may be seen as a complementary good to an existing currency system with quick fluctuations. As a consequence, a better

knowledge of bitcoin dynamics and the creation of a suitable predictive modelling framework are essential. We hypothesise in this study that bitcoin time series contain an unique internal memory, which might be used to enhance the performance of a memory-based time series model if the internal memory length could be quantified. Using two artificial intelligence modelling frameworks, we intend to analyse and predict the price fluctuations of the most popular cryptocurrencies, such as Bitcoin, Ethereum, and Ripple.

INPUT AND OUTPUT DESIGN

INPUT DESIGN

The input design is the link between the information system and the user. It comprises developing data preparation requirements and processes, as well as the actions necessary to transform transaction data into a processable format. This may be done by looking at the computer to see whether it can read data from a written or printed document, or by having users manually enter the data into the system. The aims of input design are to reduce the amount of input required, manage errors, reduce delays, eliminate unnecessary phases, and simplify the process. The input is designed to provide security and convenience while still retaining privacy. Input Design took into mind the following factors:

What information should be provided as input?

How should the data be organised or coded?

The dialogue that will help the operational people provide feedback.

Methods for creating input validations, as well as what to do if an error occurs.

OBJECTIVES

1.Input design is the process of converting a user-oriented description of an input into a computer-based system. This design is essential for preventing data input errors and guiding management in the correct direction for obtaining reliable data from the computerised system.

2. It's done by creating user-friendly data entry panels that can handle massive volumes of data. The goal of input design is to make data entry more straightforward and error-free. The data entry panel is set up in a way that allows you to do all of the data manipulations. It also gives you access to your records.

3.The data will be checked when it has been entered. Information may be entered on screens. When necessary, appropriate notifications are provided, ensuring that the user is never caught off guard. As a consequence, the purpose of input design is to create an input layout that is simple to understand.

OUTPUT DESIGN

A high-quality output meets the demands of the end user and displays information clearly. The outcomes of any system's processing are communicated to users and other systems through outputs. In output design, it is chosen how the information will be displaced for immediate usage as well as the hard copy output. It is the most important and direct source of information for the user. Through efficient and intelligent output design, the system's interface with the user is enhanced.

1. Creating computer output should be done in a methodical, well-thought-out manner; the appropriate output must be developed while ensuring that each output component is designed in such a way that users will find the system simple to use and effective. While analysing and designing

computer output, they should identify the precise output that is necessary to meet the criterion.
2.Choose how you want the information to be presented.
3.Make a paper, report, or other document that includes the information from the system.

- The output form of an information system should fulfil one or more of the following objectives.
- Disseminate information regarding the company's historical operations, present condition, and future prospects.
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

2. LITERATURE SURVEY

1) Using the Bitcoin Transaction Graph to Predict the Price of Bitcoin

AUTHORS: Greaves, A., & Au, B.

Bitcoin is the most popular cryptocurrency in the world, enabling users to conduct safe and anonymous online transactions. Consumers, corporations, investors, and speculators have all been interested in the Bitcoin ecosystem in recent years. While much study has been done on the Bitcoin network's architecture, only a small amount of research has been done on the network's effect on the total Bitcoin price. The predictive potential of blockchain network-based characteristics on the future price of Bitcoin is investigated in this article. We achieve up-down Bitcoin price movement categorization accuracy of about 55% as a consequence of blockchain-network-based feature engineering and machine learning optimization.

2) CRYPTOCURRENCY VALUE FORMATION: AN EMPIRICAL ANALYSIS LEADING TO A COST OF PRODUCTION MODEL FOR VALUING BITCOIN
AUTHORS: Hayes, A. S.

Using cross-sectional empirical data on 66 of the most commonly used 'coins,' this research tries to establish the probable source(s) of value that cryptocurrencies display in the marketplace. The difficulty of'mining' for coins, the pace of unit creation, and the cryptographic technique used were all identified as three primary determinants of cryptocurrency value in a regression model. These are marginal variations in the cost of creation of one currency over another, all other things being equal. The comparable values were calculated in bitcoins, which avoided most of the price fluctuation associated with the dollar exchange rate. The regression model that results may be used to better understand the determinants of relative value in the nascent field of cryptocurrencies. A cost of production model for pricing bitcoin is presented based on the previous study, using energy as the key input. This theoretical model generates helpful outcomes for both individual producers and the bitcoin exchange rate on a macro level, by determining breakeven thresholds to start and halt production. Bitcoin mining seems to be similar to a competitive commodities market, with miners producing until their marginal expenses equal their marginal output.

3. SYSTEM STUDY

FEASIBILITY STUDY

The project's feasibility is evaluated at this phase, and a business proposal is provided, along with a very basic project design and some cost estimates. During system analysis, a feasibility evaluation of the proposed system will be performed. This is to ensure that the intended

system will not create any issues for the organisation. For feasibility study, a fundamental understanding of the system's key demands is necessary.

Three key considerations involved in the feasibility analysis are,

- **ECONOMICAL FEASIBILITY**
- **TECHNICAL FEASIBILITY**
- **SOCIAL FEASIBILITY**

ECONOMICAL FEASIBILITY

This study is being conducted to analyse the system's economic impact on the company. The amount of money the company may spend on research and development for the system is limited. It is vital to provide justification for the expenditure. As a consequence, the final system was completed on time and on budget, thanks to the fact that the bulk of the technologies used were freely available. The only components that needed to be purchased were the customised ones.

TECHNICAL FEASIBILITY

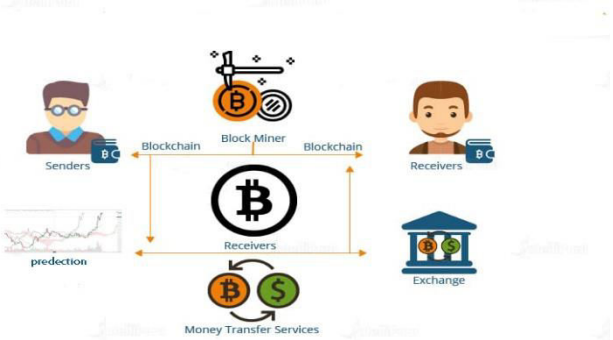
The goal of this study is to assess the system's technological viability, or technical requirements. Any system developed should not exert a significant strain on the existing technical resources. As a consequence, current technical resources will be put under a lot of strain. As a consequence, the consumer will be held to high standards. The planned system must have a minimal requirement since very little or no adjustments are required to implement this system.

SOCIAL FEASIBILITY

The study's goal is to assess the system's level of acceptability among users. This refers to the practise of instructing a user on how to utilise technology successfully. Instead of being fearful of the system, the user should embrace it as a need. The methods utilised to educate and familiarise users with the system are entirely responsible for their level of adoption. Because he is the system's ultimate user, his self-esteem must be reinforced so that he can offer constructive criticism, which is encouraged.

4.SYSTEM DESIGN

SYSTEM ARCHITECTURE:



DATA FLOW DIAGRAM:

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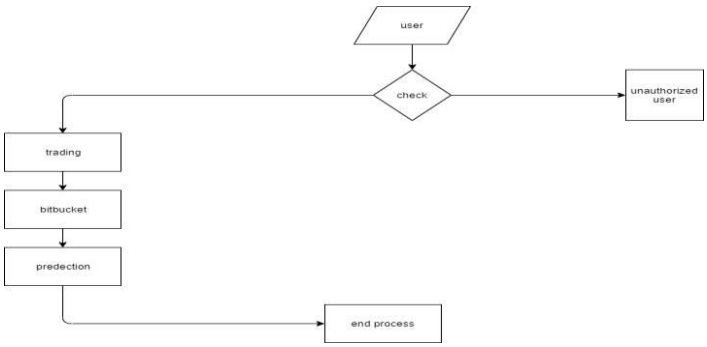
1. A DFD is sometimes known as a bubble chart. It's a fundamental graphical formalism for depicting a system in terms of the input it gets, the processing it does on that data, and the data it produces as output.

2. The data flow diagram is one of the most important modelling tools (DFD). It's used to symbolise the numerous parts of the system. These components include the system process, the data used by the process, an external entity that interacts with the system, and the information flows in the system.

3. A DFD shows how data flows through a system and is changed via a series of transformations. It's a visual depiction of data flow and the changes that occur when data moves from source to destination.

4. The DFD is sometimes known as a bubble chart. A DFD may be used to represent a system at any degree of abstraction. DFD may be broken down into levels, each of which represents a distinct level of information flow and functional detail.

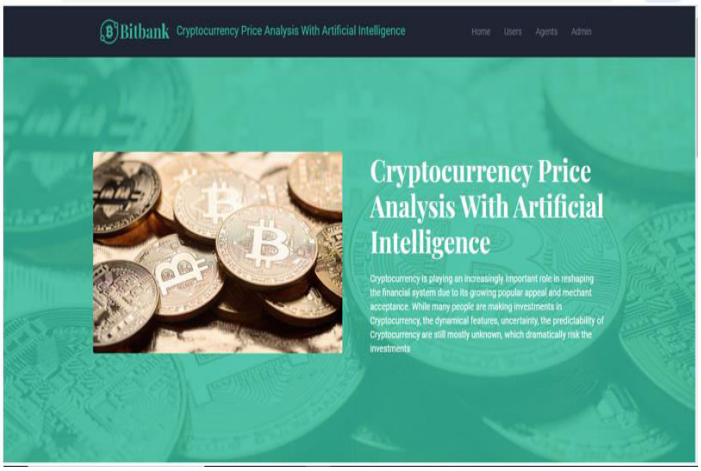


. **Data Flow Diagram**

SAMPLE TEST CASES:

S.no	Test Case	Excepted Result	Result	Remarks(IF Fails)
1	User REGISTERED	If user registration successfully.	Pass	If user is not registered.
2	Agent REGISTERED	If agent registration successfully.	Pass	If agent is not registered.
3	ADMIN	user rights will be accepted here.	Pass	If user are not registered.
4	ADMIN	agent rights will be accepted here.	Pass	If agent are 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

5. RESULTS



Main Home Page

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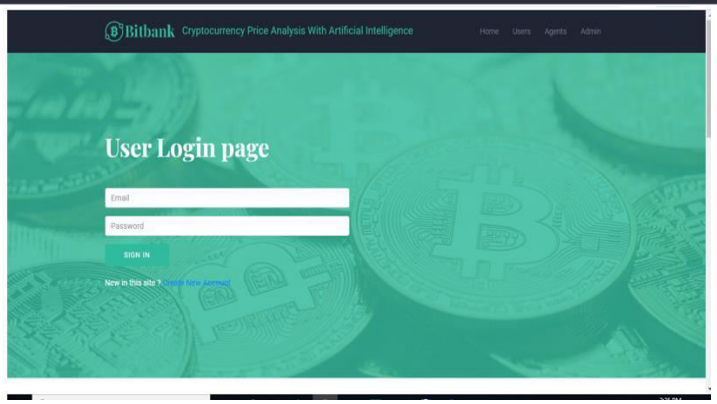
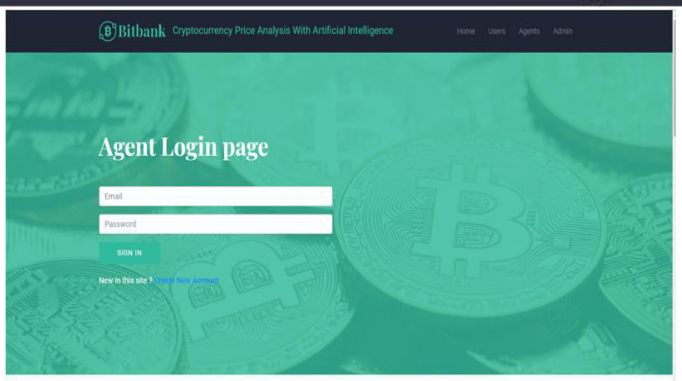
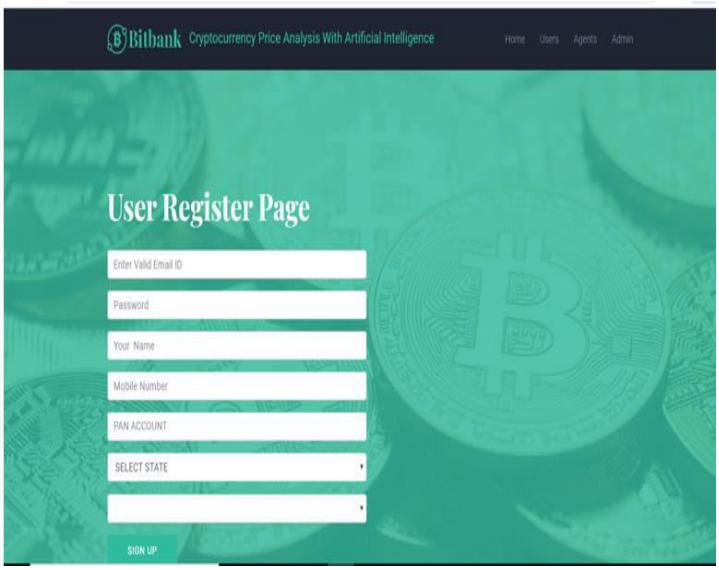


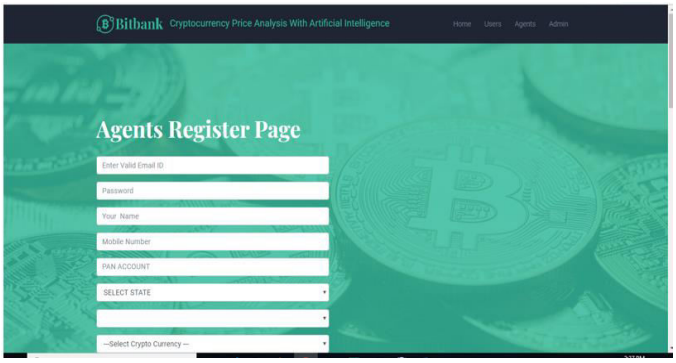
User Register Page



Agent Login Page



User Registration Form



Agent Register page

Admin Login Page

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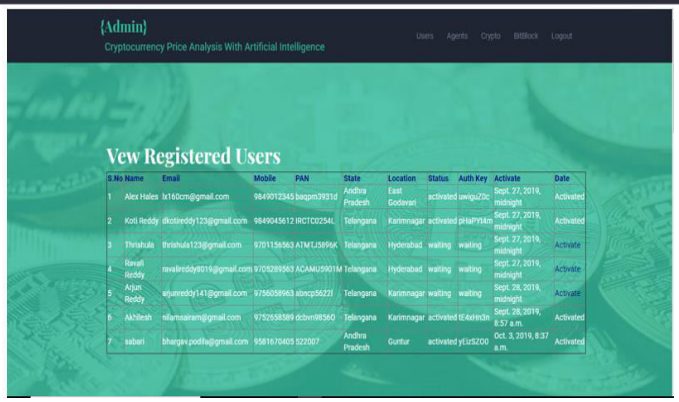
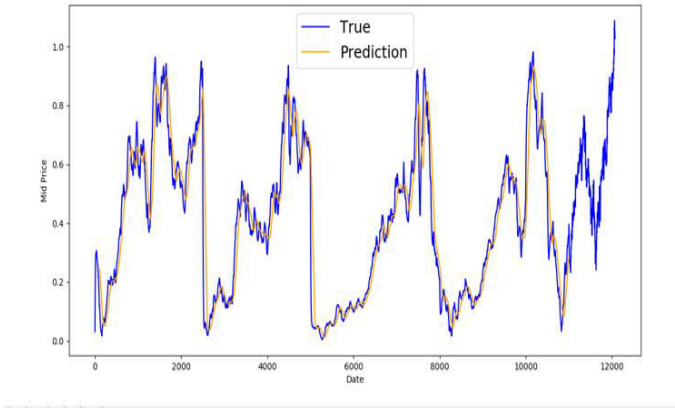
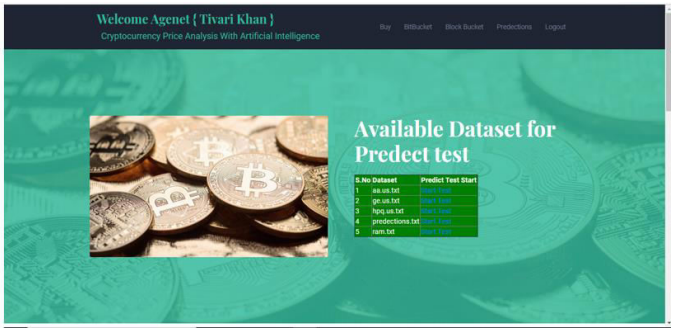


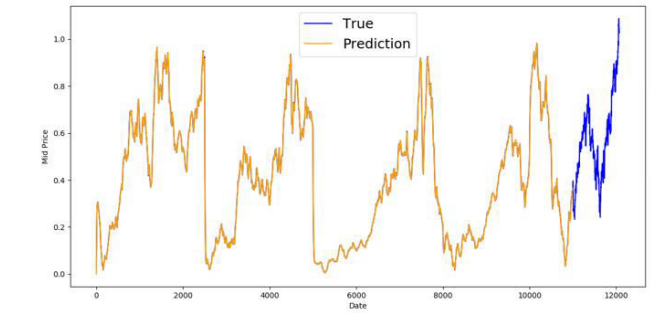
Admin Activate Users



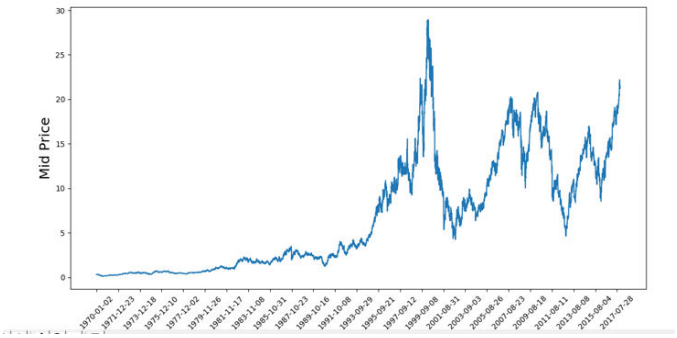
True Predections



Agent view predections dataset for test



Predectins



Dataset analysis

User buying coins

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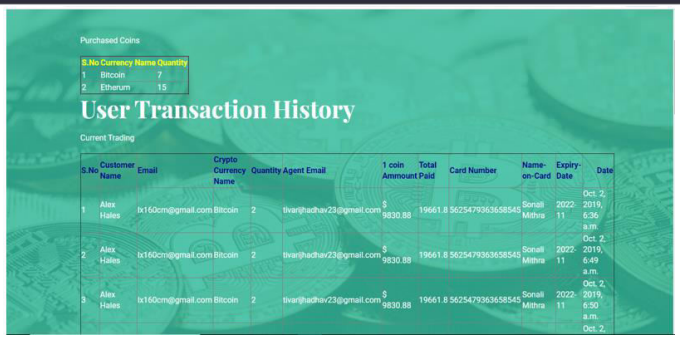
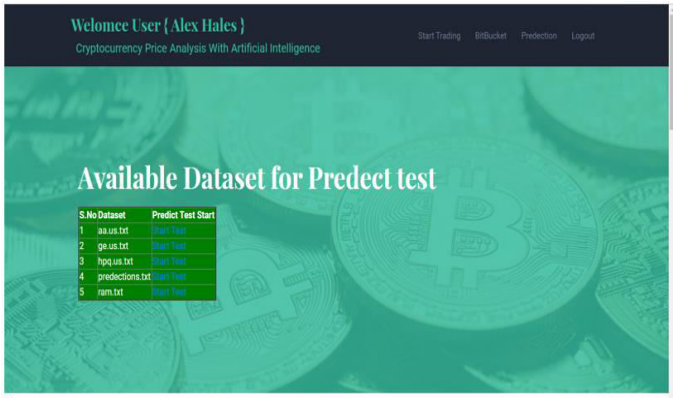


User purchased Coins



User can test the predections

6. CONCLUSION

Bitcoin and other cryptocurrencies have emerged as the primary means of decentralisation. Following Bitcoin, a wave of other cryptocurrencies such as Ethereum and Ripple appeared. Because of the extreme volatility in their worth, many people maintain them as a kind of speculation. As a consequence, understanding the fundamental features and predictability of various cryptocurrencies is critical. We use two artificial intelligence frameworks to analyse and predict the price movements of Bitcoin, Etherum, and Ripple: fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM) (LSTM). Despite their differences in fundamental structures, we showed that the ANN and LSTM models are comparable and perform similarly well in price prediction. After that, the influence of historical memory on model prediction is looked into further. We observed that ANN is more reliant on long-term history, but LSTM is more reliant on short-term dynamics, meaning that LSTM is more efficient than ANN at retrieving important information from historical memory. When given enough historical data, however, ANN may be able to match the accuracy of LSTM. This is the first study to prove that bitcoin prices can be forecast. The argument for predictability, however, may vary depending on the type of the machine-learning model in issue.

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