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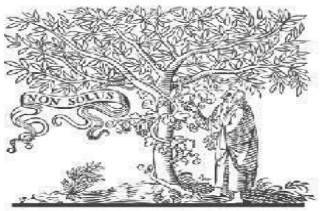

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Title: CRYPTOCURRENCY PRICE ANALYSIS WITH ARTIFICIAL INTELLIGENCE

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CRYPTOCURRENCY PRICE ANALYSIS WITH ARTIFICIAL INTELLIGENCE

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ABSTRACT

Due to its expanding popularity and merchant acceptance, crypto money is playing an increasingly crucial role in altering the financial system. While many individuals are investing in cryptocurrency, the dynamical characteristics, unpredictability, and predictability of cryptocurrency are still largely unknown, putting investments at risk. It is a question of attempting to comprehend the variables that influence the production of value. To analyse the price dynamics of Bitcoin, Etherum, and Ripple, we employ powerful artificial intelligence frameworks of fully linked Artificial Neural Network (ANN) and Long Short-Term Memory (LSTM) Recurrent Neural Network. We discovered that ANN relies more on long-term history, while LSTM relies more on short-term dynamics, implying that LSTM is more efficient at extracting relevant information from historical memory than ANN. However, when given enough historical data, ANN may attain a comparable level of accuracy as LSTM. This research is the first to show that the price of cryptocurrency can be predicted. However, depending on the nature of the machine-learning model in question, the justification for predictability may differ.

1. INTRODUCTION

Cryptocurrency is a peer-to-peer digital currency and payment system that operates on the internet using a computer algorithm. When a miner breaks an algorithm to add a block of transactions to a public ledger known as the blockchain, the cryptocurrency is generated. It uses an encryption system and a distributed network to let individuals to store and transport data. The bitcoin system relies on mining, which is both essential and competitive. The miner with the most processing power has a higher probability of discovering a new currency than the miner with the least. Bitcoin is the first and most popular digital currency, with a market capitalization of more than $ 7 billion in 2014 and a huge growth to $ 29 billion in 2017. Satoshi Nakamoto initially created Bitcoin in 2008. The most amazing characteristic of bitcoin is its decentralisation, which may effectively eliminate the influence of conventional financial sectors and monetary authorities owing to its blockchain network features. Furthermore, Bitcoin's electronic payment system is based on cryptographic proof rather than mutual trust, as its transaction history cannot be altered without redoing all proofs of work on all blockchains, which play a critical role as a trust intermediary and can be widely used in reality, such as recording charitable contributions to avoid corruption. Furthermore, bitcoin offered a controlled anonymity system, which improves users' safety and anonymity. For example, we may utilise this characteristic of blockchain to create identification cards, which not only protects our privacy but also verifies our identity. Investing in cryptocurrencies, such as Bitcoin, is now one of the most effective methods to make money. For example, the price of Bitcoin increased significantly in 2017, rising from a low of 963 USD on January 1st to a high of 19186 USD on December 17th, and closing at 9475 USD at the end of the year. As a

result, the rate of return on bitcoin investment in 2017 was over 880 percent, which is a stunning and unexpected result for most investors. While a rising number of individuals are investing in cryptocurrency, the majority of investors will not be able to benefit since they are unaware of the dynamics of cryptocurrency and the crucial aspects that drive bitcoin trends. As a result, increasing people's understanding of important aspects might assist us in becoming savvy investors. Despite the fact that market prediction is difficult due to its complexity, the dynamics are predictable and intelligible to some extent. When there is a scarcity of bitcoin, for example, its sellers will raise its price because investors who see bitcoin as a lucrative investment opportunity will have a strong desire to pay for bitcoin. Furthermore, certain external variables, like as political issues, might easily alter the price of bitcoin. Although there have been few studies aimed at understanding Cryptocurrency time series and building statistical models to reproduce and predict price dynamics, there have been a few studies aimed at understanding Cryptocurrency time series and building statistical models to reproduce and predict price dynamics. Madan et al., for example, gathered bitcoin prices across time intervals of 0.5, 1, and 2 hours and integrated them with the blockchain network, bitcoin's underlying technology. Their prediction algorithm uses random forests and binomial logistic regression classifiers, and the model's accuracy in forecasting bitcoin's price is about 55%. To enhance bitcoin trading strategy, Shah et al. applied Bayesian regression and took use of high frequency (10-second) price data. Their models had likewise been quite successful. An MLP-based prediction model was proposed to estimate the following day price of bitcoin utilising two sets of inputs: the opening, minimum, maximum, and closing price, and the Moving Average of both short (5,10,20 days) and long (100, 200 days) windows. During validation, their model was shown to be accurate to within 5% of the time. Many academic studies have been conducted on exchange rate forecasting, such as Meese and Rogoff's (1983, 1988) monetary and portfolio balance models. Although significant attempts have been made to analyse and anticipate the movements of conventional financial markets, particularly the stock market, predicting the values of cryptocurrencies is still in its infancy. Traditional time series approaches are not as effective as these stock price prediction models since cryptocurrencies are not identical to stocks but may be seen as a supplementary good to an existing currency system with rapid changes. As a result, a deeper understanding of cryptocurrency dynamics and the development of an appropriate predictive modelling framework are critical. In this research, we hypothesise that cryptocurrency time series have a distinct internal memory, which might be exploited to improve the performance of a memory-based time series model provided the length of internal memory could be measured. We want to analyse and anticipate the price movements of the most prominent cryptocurrencies, such as Bitcoin, Ethereum, and Ripple, using two artificial intelligence modelling frameworks.

INPUT AND OUTPUT DESIGN

INPUT DESIGN

The connection between the information system and the user is the input design. It entails creating data preparation specifications and procedures, as well as the steps required to convert transaction data into a usable format for processing. This can be accomplished by inspecting the computer to read data from a written or printed document, or by having people key the data into the system directly. Limiting the amount of input needed, controlling mistakes, minimising delays, eliminating superfluous stages, and making the process simple are all goals of input design. The input is created in such a manner that it gives security and convenience while maintaining privacy. The following factors were taken into account by Input Design:

What data should be given as input?

- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

1.The process of translating a user-oriented description of an input into a computer-based system is known as input design. This design is critical for avoiding data entry mistakes and directing management in the right way for collecting accurate information from the computerised system.

2. It is accomplished by designing user-friendly data input panels that can manage enormous amounts of data. The purpose of input design is to make data entering simpler and error-free. The data entering panel is set up in such a manner that you may execute all of the data manipulations. It also allows you to see your records.

3.After the data has been input, it will be validated. Screens may be used to input information. Appropriate messages are sent when required, ensuring that the user is never caught off guard. As a result, the goal of input design is to produce an easy-to-follow input layout.

OUTPUT DESIGN

A quality output is one that satisfies the end user's needs and shows information clearly. Any system's processing results are conveyed to users and other systems through outputs. It is decided how the information will be displaced for immediate use, as well as the hard copy output, in output design. It is the user's most essential and direct source of information. The system's interaction with the user is improved via efficient and intelligent output design.

1. Creating computer output should be done in a systematic, well-thought-out manner; the proper output must be created while ensuring that each output part is built in such a way that users will find the system easy to use and effective. They should identify the exact output that is required to satisfy the criteria while analysing and designing computer output.

2.Select information presentation ways.

3.Create a paper, report, or other format that contains the system's information.

An information system's output form should achieve one or more of the following goals.Convey information about past activities, current status or projections of the

- 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. Economic prediction using neural networks: the case of IBM daily stock returns

AUTHORS: H. White

The findings of an ongoing study to search for and decode nonlinear regularities in asset price movements using neural-network modelling and learning approaches are described in a paper. The author concentrates on the daily returns of IBM common stock. Dealing with the prominent aspects of economic data emphasises the importance of statistical inference and necessitates changes to traditional learning procedures that may be effective in other situations.

4.Designing a neural network for forecasting financial and economic time series

AUTHORS: Kaastra and M. Boyd

Artificial neural networks are function approximators that are ubiquitous and very adaptable. They were originally employed in the domains of cognitive science and engineering. The use of neural networks in finance for tasks including pattern recognition, classification, and time series forecasting has exploded in recent years. However, because of the vast number of parameters that must be chosen when developing a neural network forecasting model, the design process is still a lot of trial and error. The goal of this study is to give a step-by-step guidance to designing a neural network for economic time series data forecasting. A discussion of tradeoffs in parameter selection, certain typical mistakes, and areas of dispute among practitioners is included in an eight-step approach for designing a neural network forecasting model.

3. SYSTEM STUDY

FEASIBILITY STUDY

In this phase, the project's viability is assessed, and a business proposal is presented, along with a very generic project plan and some cost estimates. A feasibility assessment of the proposed system is to be carried out during system analysis. This is to guarantee that the planned system will not cause the organisation any problems. A basic grasp of the system's primary needs is required for feasibility analysis.

Three key considerations involved in the feasibility analysis are,

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

ECONOMICAL FEASIBILITY

This research is being carried out to determine the system's economic effect on the organisation. The amount of money the corporation has to invest in the system's research and development is restricted. It is necessary to justify

the spending. As a result, the produced system came in under budget, which was made possible by the fact that the majority of the technologies employed were publicly accessible. The customised items were the only ones that needed to be acquired.

TECHNICAL FEASIBILITY

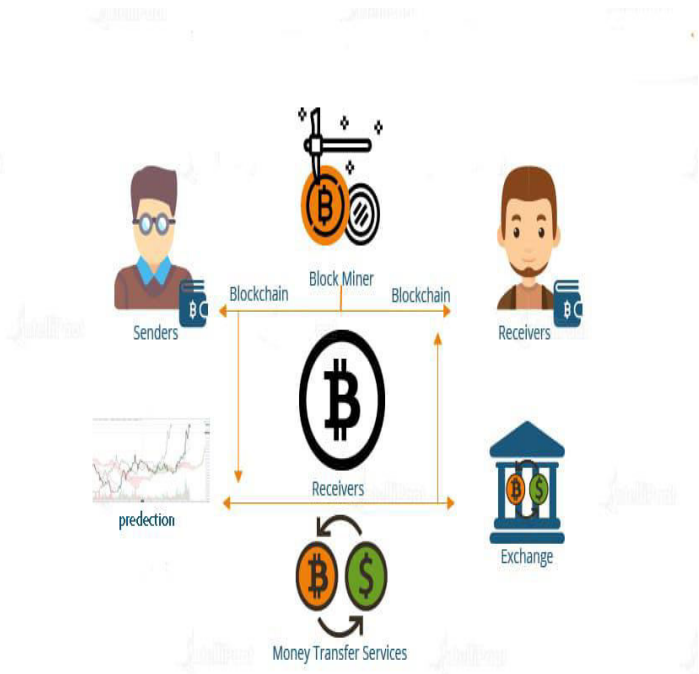
This research is being carried out to determine the system's technological feasibility, or technical needs. Any system that is created should not place a large burden on the available technological resources. As a result, there will be a lot of pressure on the existing technological resources. As a result, the customer will be subjected to severe expectations. Because very little or no modifications are necessary to deploy this system, the designed system must have a low requirement.

SOCIAL FEASIBILITY

The purpose of the research is to determine the user's degree of acceptance of the system. This covers the process of teaching the user how to effectively utilise the technology. The user should not be afraid of the system, but rather embrace it as a need. The techniques used to educate and familiarise the user with the system are totally responsible for the degree of acceptance by the users. His self-esteem must be boosted so that he can provide constructive feedback, which is encouraged since he is the system's ultimate user.

SYSTEM DESIGN

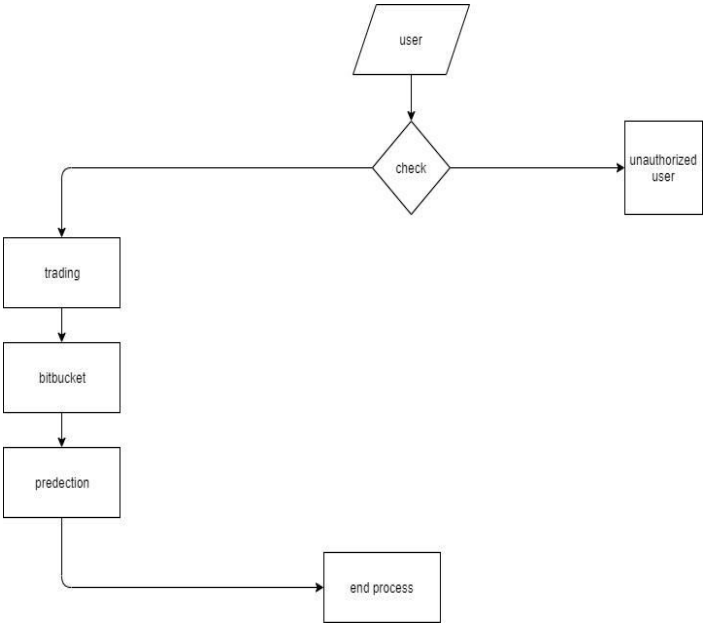
SYSTEM ARCHITECTURE:



DATA FLOW DIAGRAM:

1. A bubble chart is another name for a DFD. It is a basic graphical formalism that may be used to depict a system in terms of the data it receives, the processing it does on that data, and the data it generates as output.
2. One of the most essential modelling tools is the data flow diagram (DFD). It's used to represent the system's many components. The system process, the data utilised by the process, an external entity that interacts with the system, and the information flows in the system are all examples of these components.
3. DFD depicts how data flows through the system and is transformed by a sequence of transformations. It's a graphical representation of data flow and the changes that occur when data goes from input to output.

4. DFD is sometimes referred to as a bubble chart. At any level of abstraction, a DFD may be used to depict a system. DFD may be divided into levels, each representing a different degree of information flow and functional detail.



SYSTEM SPECIFICATION:

HARDWARE REQUIREMENTS:

- **System** : Pentium IV 2.4 GHz.
- **Hard Disk** : 40 GB.
- **Floppy Drive** : 1.44 Mb.
- **Monitor** : 14' Colour Monitor.
- **Mouse** : Optical Mouse.
- **Ram** : 512 Mb.

SOFTWARE REQUIREMENTS:

- **Operating system** : Windows 7 Ultimate.
- **Coding Language** : Python.
- **Front-End** : Python.
- **Designing** : Html,css,javascript.
- **Data Base** : MySQL.

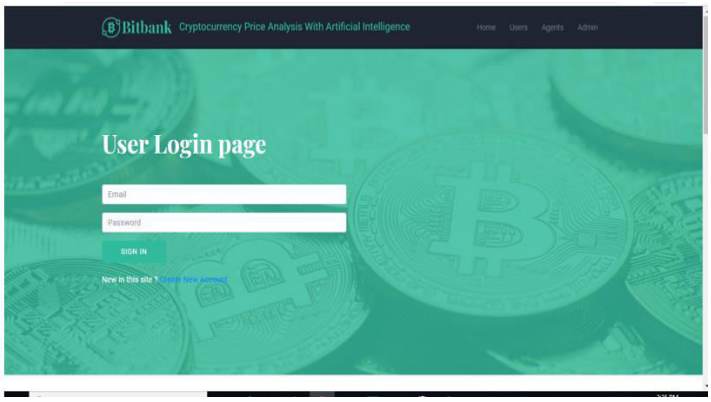
SAMPLE TEST CASES

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

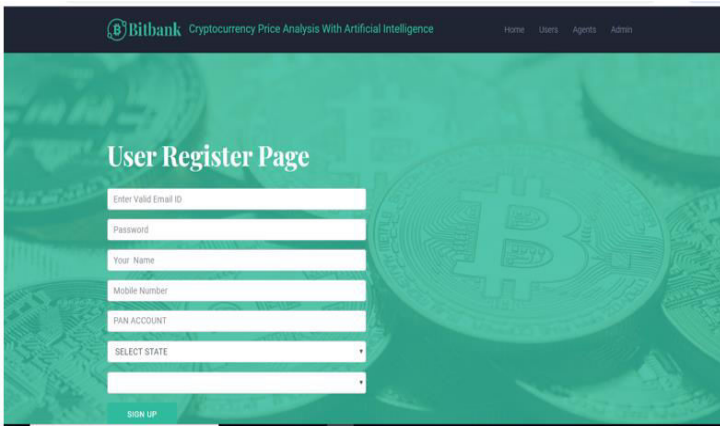
Sample Screens

Home Page

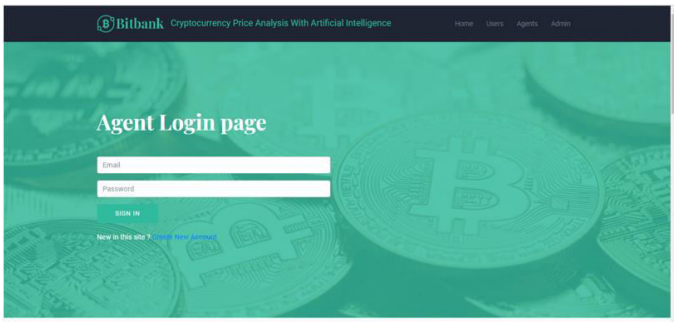
Main Home Page



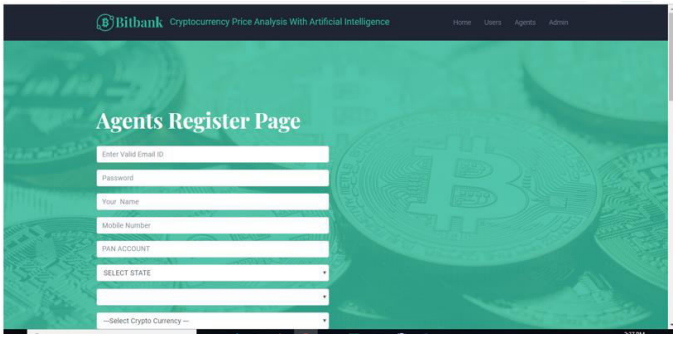
User Register Page



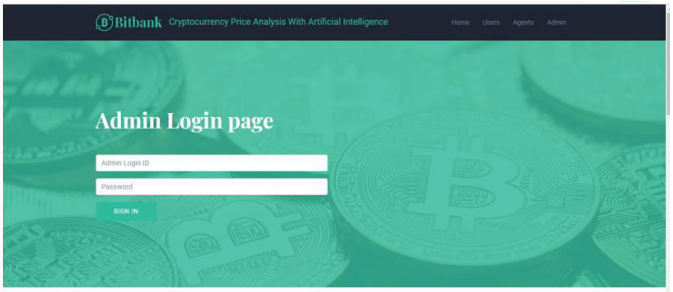
User Registration Form



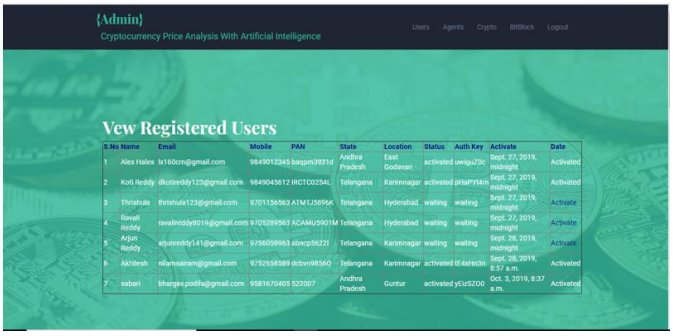
agent Login page



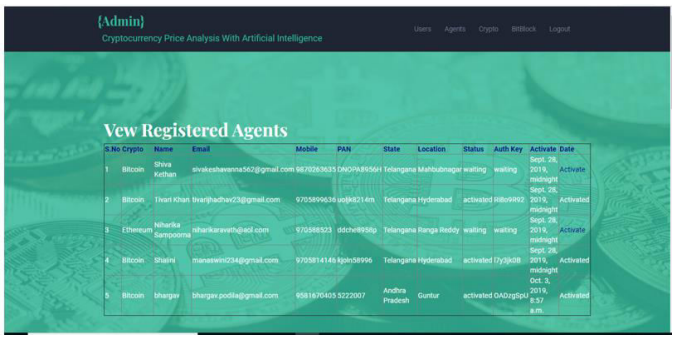
Agent Register page



Admin Login Page

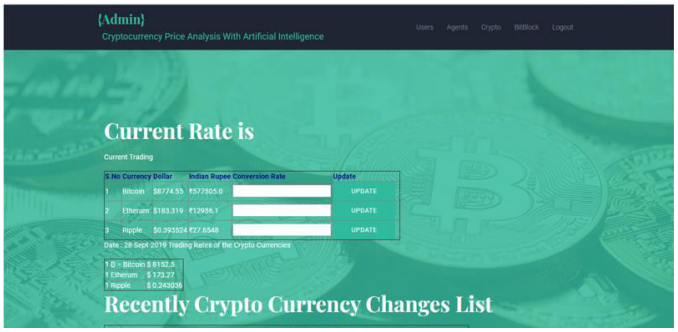


Admin Activate Users



Admin Activate Agents

Agent buting crypto coins



Current Price and Update

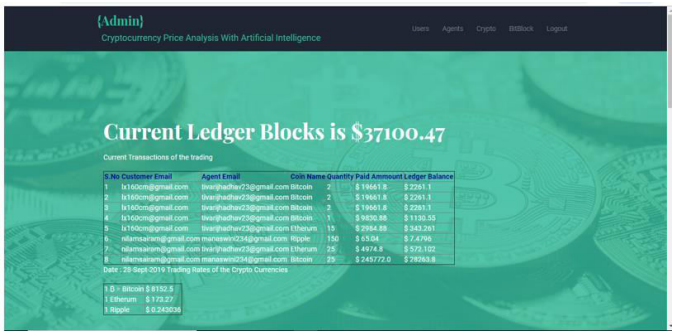
Agent buy Transactions

OUR UNTOLD STORY

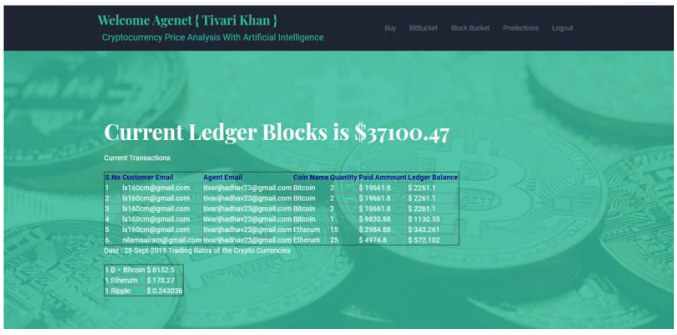
Bitcoin Knowledge Base.

Crypto update history

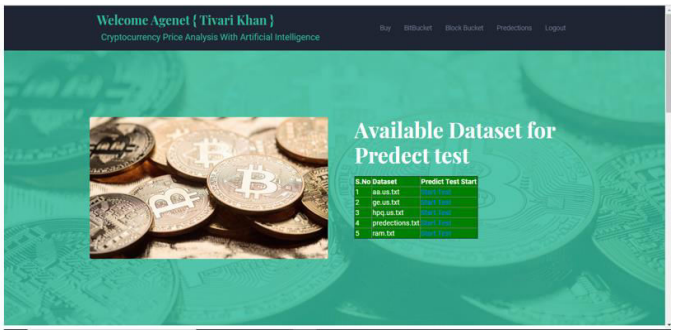
Agent transaction history



Blockchain ledger maintance

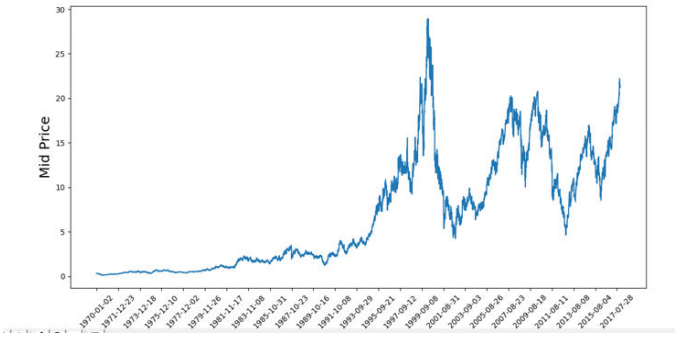


Agent view Ledger balance



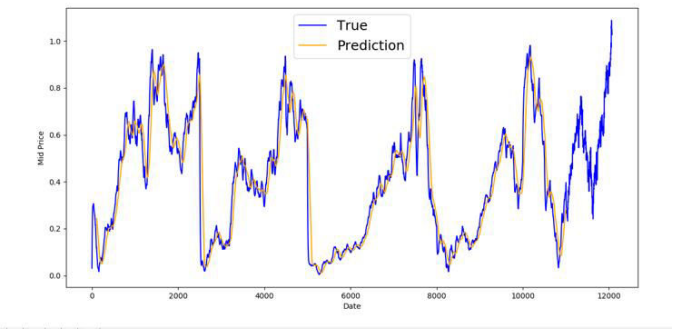
Agent view predections dataset for test

User buying coins

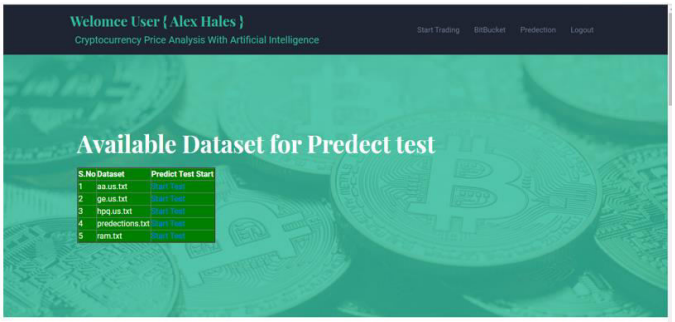


Dataset analysis

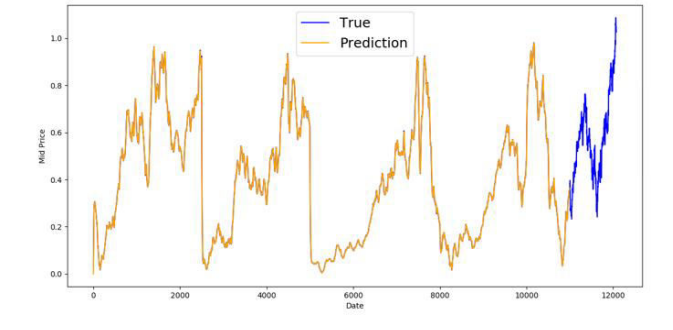
User purchased Coins



True Predections



User can test the predections



Predectins

CONCLUSION

Bitcoin and other cryptocurrencies have established themselves as the main role of decentralisation. Following Bitcoin, a slew of other cryptocurrencies emerged, including Ethereum and Ripple. Many individuals keep them as a kind of speculation because to the enormous unpredictability in their value. As a result, it is crucial to comprehend the underlying characteristics and predictability of those cryptocurrencies. To analyse and anticipate the price movements of Bitcoin, Etherum, and

Ripple, we employ two artificial intelligence frameworks: fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM). We demonstrated that, despite their differences in underlying structures, the ANN and LSTM models are similar and both perform quite well in price prediction. The impact of historical memory on model prediction is then investigated further. We discovered that ANN relies more on long-term history, while LSTM relies more on short-term dynamics, implying that LSTM is more efficient at extracting relevant information from historical memory than ANN. However, when given enough historical data, ANN may attain a comparable level of accuracy as LSTM. This research is the first to show that the price of cryptocurrency can be predicted. However, depending on the nature of the machine-learning model in question, the justification for predictability may differ.

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