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CRYPTOCURRENCY PRICE ANALYSIS WITH ARTICAL INTILLEGENCE

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ABSTRACT

Cryptocurrency markets have gained significant global attention due to their decentralized nature, high volatility, and potential for substantial financial returns. Accurate analysis of cryptocurrency prices is essential for investors, traders, and financial institutions seeking to make informed investment decisions in dynamic market environments. Traditional statistical methods often face challenges in capturing the complex and nonlinear behavior of cryptocurrency price movements. This paper presents a cryptocurrency price analysis framework using Artificial Intelligence techniques to analyze market trends and predict future price fluctuations. The proposed approach utilizes historical price data, trading volumes, market indicators, social sentiment, and blockchain-related information to develop intelligent predictive models. Machine learning and deep learning algorithms are employed to identify hidden patterns, recognize market behaviors, and generate accurate price forecasts. The integration of Artificial Intelligence enhances analytical capabilities by processing large-scale financial data and adapting to rapidly changing market conditions. Experimental analysis demonstrates that AI-driven models improve prediction accuracy, support risk assessment, and provide valuable insights into cryptocurrency market dynamics. The proposed framework offers an intelligent and scalable solution for cryptocurrency price analysis and financial decision-making.

I. INTRODUCTION

Cryptocurrency is the peer-to-peer digital moneyory and payment system that exist online via a controlled algorithem. When a miner cracks an algorithem to record a block of transactions to public ledger named blockchain and the cryptocurrency is created when the block is added to the blockchain. It allows people to store and transfer through encryption protocol and distributed network. Mining is a necessary and competitive component of the cryptocurrency system. The miner with more computational power has a better chance of finding a new coin than that of less. Bitcoin is the first and one of the leading digital currencies (its market capitalisation had more than $ 7 billion in 2014, and then it increased significantly to $ 29 billion in 2017) which was first introduced by Satoshi Nakamoto in 2008. Among many features of bitcoin, the most impressive one is decentralisation that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its blockchain network features . In addition, the electronic payment system of Bitcoin is based on cryptographic proof rather than the trust between each other as its transaction history cannot be changed unless redoing all proof of work of all blockchain, 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. Moreover, bitcoin has introduced the controllable anonymity scheme, and this enhances users' safety and anonymity by using this technology, for instance, we can take advantage of this property of blockchain to make identification cards, and it not only can protect our privacy but verify our identity. Nowadays, investing in cryptocurrencies, like Bitcoin, is one of the efficient ways of earning money. For example, the rate of Bitcoin significant rises in

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2017, from a relatively low point 963 USD on January 1ST 2017, to its peak 19186 USD on December 17th 2017, and it closed with 9475 USD at the end of the year. Consequently, the rate of return of bitcoin investment for 2017 was over 880%, which is an impressive and surprising scenery for most investors. While an increasing number of people are making investments in Cryptocurrency, the majority of investors cannot get such profit for being inconsiderable to cryptocurrencies' dynamics and the critical factors that influence the trends of bitcoins. Therefore, raising people's awareness of vital factors can help us to be wise investors. Although market prediction is demanding for its complex nature the dynamics are predictable and understandable to some degree. For example, when there is a shortage of the bitcoin, its price will be increased by their sellers as investors who regard bitcoin as a profitable investment opportunity will have a strong desire to pay for bitcoin. Furthermore, the price of bitcoin may be easily influenced by some influential external factors such as political factors . Although existing efforts on Cryptocurrency analysis and prediction is limited, a few studies have been aiming to understand the Cryptocurrency time series and build statistical models to reproduce and predict price dynamics. For example, Madan et al. collected bitcoins price with the time interval of 0.5, 1and 2 hours, and combined it with the blockchain network, the underlying technology of bitcoin. Their predictive model leveraging random forests and binomial logistic regression classifiers , and the precision of the model is around 55% in predicting bitcoin's price. Shah et al. used Bayesian regression and took advantages of high frequency (10-second) prices data of Bitcoin to improve investment strategy of bitcoin . Their models had also achieved great success. In an Multi-Layer Perceptron (MLP) based prediction model was presented to forecast the next day price of bitcoin by using two sets of input: the first type of inputs: the opening, minimum, maximum and closing price and the second set of inputs: Moving Average of both short (5,10,20 days) and long (100, 200 days) windows. During validation, their model was proved to be accurate at the 95% level. There has been many academic researches looking at exchang rate forecasting, for example, the monetary and portfolio balance models examined by Meese and Rogoff (1983, 1988) . Significant efforts have been made to analyse and predict the trends of traditional financial markets especially the stock market however, predicting cryptocurrencies market prices is still at an early stage. Compared to these stock price prediction models, traditional time series methods are not very useful as cryptocurrencies are not precisely the same with stocks but can be deemed as a complementary good of existing currency system with sharp fluctuations features. Therefore, it is urgently needed to understand the dynamics of cryptocurrencies better and establish a suitable predictive modelling framework. In this study, we hypothesise that time series of cryptocurrencies exhibits a clear internal memory, which could be used to help the memory-based time series model to works more appropriately if the length of internal memory could be quantified. We aim to use two artificial intelligence modelling frameworks to understand and predict the most popular cryptocurrencies price dynamics, including Bitcoin, Ethereum, and Ripple.

II. LITERATURE SURVEY

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

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

with different objectives. A pre-defined set of minimum qualification levels should be distributed between the crew members with minimum training time differences, training expenses or a maximum of the training level

with a limitation of the budget. First, a description of the cosmonaut training process is given. Then four models are considered for the volume planning problem. The objective of the first model is to minimize the differences between the total time of the preparation of all crew members, the objective of the second one is to minimize the training expenses with a limitation of the training level, and the objective of the third one is to maximize the training level with a limited budget. The fourth model considers the problem as an n-partition problem. Then two models are considered for the calendar planning problem.We consider the problem of planning the ISS cosmonaut training with different objectives. A pre-defined set of minimum qualification levels should be distributed between the crew members with minimum

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overall Bitcoin price. In this paper, we investigate the predictive power of blockchain network-based features on the future price of Bitcoin. As a result of blockchain-networkbased feature engineering and machine learning optimization, we obtain up-down Bitcoin price movement classification accuracy of roughly 55%. We consider the problem of planning the ISS cosmonaut training with different objectives. A pre-defined set of minimum qualification levels should be distributed between the crew members with minimum
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2) CRYPTOCURRENCY VALUE FORMATION: AN EMPIRICAL ANALYSIS LEADING TO A COST OF PRODUCTION MODEL FOR VALUING BITCOIN

AUTHORS: Hayes, A. S.

This paper aims to identify the likely source(s) of value that cryptocurrencies exhibit in the marketplace using cross sectional empirical data examining 66 of the most used such 'coins'. A regression model was estimated that points to three main drivers of cryptocurrency value: the difficulty in 'mining 'for coins; the rate of unit production; and the cryptographic algorithm employed. These amount to relative differences in the cost of production of one coin over another at the margin, holding all else equal. Bitcoin-denominated relative prices were used, avoiding much of the price volatility associated with the dollar exchange rate. The resulting regression model can be used to better understand the drivers of relative value observed in the emergent area of cryptocurrencies. Using the above analysis, a cost of production model is proposed for valuing bitcoin, where the primary input is electricity. This theoretical model produces useful results for both an individual producer, by setting breakeven points to start and stop production, and for the bitcoin exchange rate on a macro level. Bitcoin production seems to resemble a competitive commodity market; in theory miners will produce until their marginal costs equal their marginal product.

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

AUTHORS: H. White

A report is presented of some results of an ongoing project using neural-network modeling and learning techniques to search for and decode nonlinear regularities in asset price movements. The author focuses on the case of IBM common stock daily returns. Having to deal with the salient features of economic data highlights the role to be played by statistical inference and requires modifications to standard learning techniques which may prove useful in other contexts

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

AUTHORS: Kaastra and M. Boyd

Artificial neural networks are universal and highly flexible function approximators first used in the fields of cognitive science and engineering. In recent years, neural network

applications in finance for such tasks as pattern recognition, classification, and time series forecasting have dramatically increased. However, the large number of parameters that must be selected to develop a neural network forecasting model have meant that the design process still involves much trial and error. The objective of this paper is to provide a practical introductory guide in the design of a neural network for forecasting economic time series data. An eight-step procedure to design a neural network forecasting model is explained including a discussion of tradeoffs in parameter selection, some common pitfalls, and points of disagreement among practitioners.

III. SYSTEM ANALYSIS AND DESIGN

EXISTING SYSTEM:

Although existing efforts on Cryptocurrency analysis and prediction is limited, a few studies have been aiming to understand the Cryptocurrency time series and build statistical models to reproduce and predict price dynamics. Madan et al. collected bitcoins price with the time interval of 0.5, 1and 2 hours, and combined it with the blockchain network, the underlying technology of bitcoin. Their predictive model leveraging random forests and binomial logistic regression classifiers and the precision of the model is around 55% in predicting bitcoin's price. While an increasing number of people are making investments in Cryptocurrency, the majority of investors cannot get such profit for being inconsiderable to cryptocurrencies' dynamics and the critical factors that influence the trends of bitcoins.

DISADVANTAGES OF EXISTING SYSTEM:

- Therefore, raising people's awareness of vital factors can help us to be wise investors. Although market prediction is demanding for its complex nature, the dynamics are predictable and understandable to some degree.
- By using random forests and binomial logistic regression We cannot predict the 100% results

PROPOSED SYSTEM:

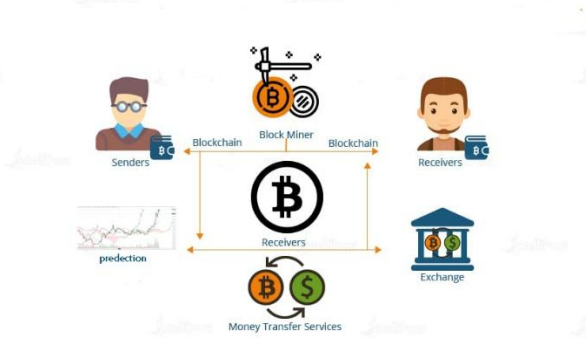
Among many features of bitcoin, the most impressive one is decentralisation that it can remove the involvement of Traditional Financial sectors and monetary authorities effectively due to its block chain network features. In proposed system we are using ANN Algorithm and LSTM easily predict the time series of crypto currency prices. We Use An ANN model to predict the price of Bitcoin one day into the future using five different lengths of memory. While LSTM is intentionally designed to model the internal memory flow and its impact on future prediction, therefore, both ANN and LSTM are suitable for the crypto currencies price time series prediction

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 can take advantage of this property of blockchain to make identification cards, and it not only can protect our privacy but verify our identity.

SYSTEM DESIGN

SYSTEM ARCHITECTURE:



IV. SYSTEM IMPLEMENTATION

MODULES:

- User
- Agent

- admin
- artificial intelligence

User

Registration of User details next admin activated by the user. go to user page and login. User view some fields [start trading, bit bucket, prediction, logout] now open start treding page contains sale available cryptocurrencies and user buy the currency.user views the transaction history details and user view the prediction for available datasets.

Agent

First registration of the agent page. next activated by the admin. Login agent page. agent view some fields[buy, bitbucket, block bucket, prediction, logout]. here three types of digital currency's are there [bitcoins, ripple, Etherum] agent can buy digital currency (any one or all three).Agent buying the crypto currency. agent transaction history also available.

Admin

The aim of admin is to approve the users and agents .admin contains some fields[user,agents,crypto,bitblock].admin view user and agent registered details and in crypto field user update the currecy rate and view the recently crypto currency changes list.admin view the current transaction details. When a miner cracks an algorithem to record a block of transactions to public ledger named blockchain and the cryptocurrency is created when the block is added to the blockchain. It allows people to store and transfer through encryption protocol and distributed network. Mining is a necessary and competitive component of the cryptocurrency system. The miner with more computational power has a better chance of finding a new coin than that of less . Bitcoin is the first and one of the leading digital currencies (its market capitalisation had more than $ 7 billion in 2014, and then it increased significantly to $ 29 billion in 2017) which was first introduced by Satoshi Nakamoto in 2008. Among many features of bitcoin, the most impressive one is decentralisation that it can remove the involvement of traditional financial sectors and monetary authorities effectively due to its blockchain network features.

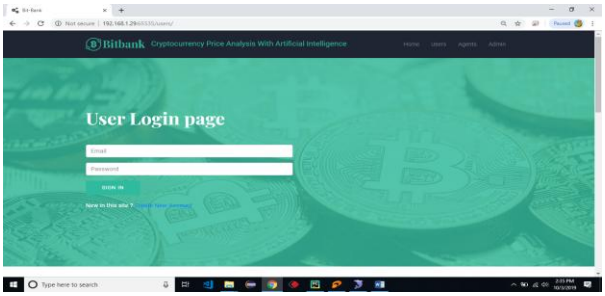
Artificial intelligence

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 branches of science and technology, including manned space programs. 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 .

V. SCREEN SHOTS

Home Page

Main Home Page



User Register Page

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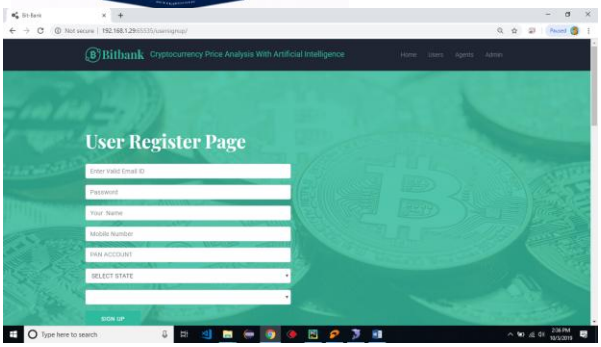
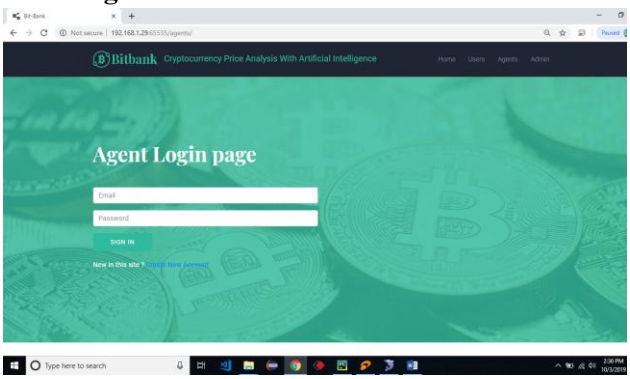
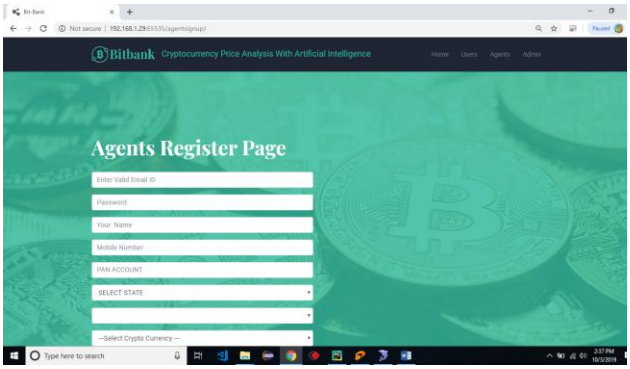


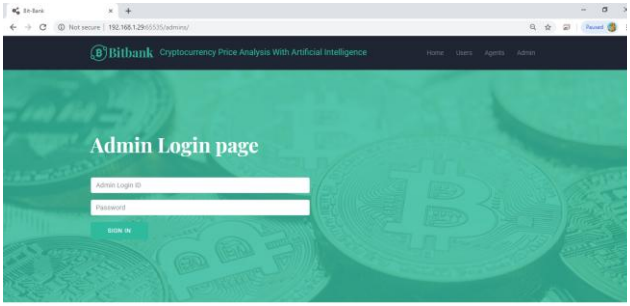
User Registration Form



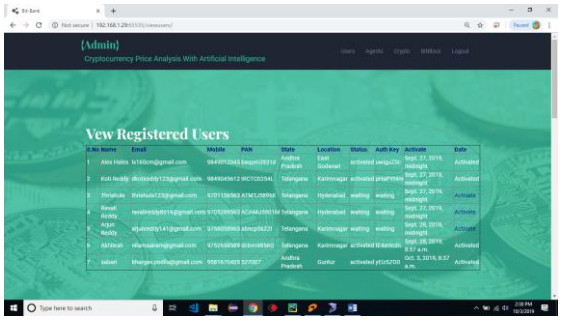
agent Login page



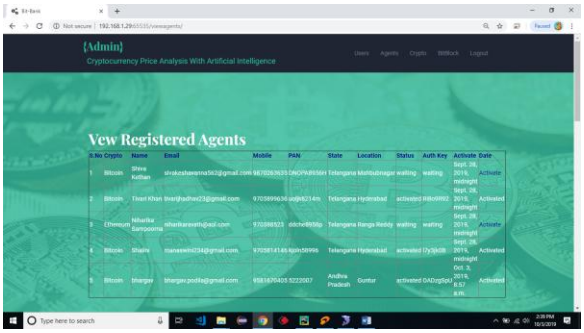
Agent Register page



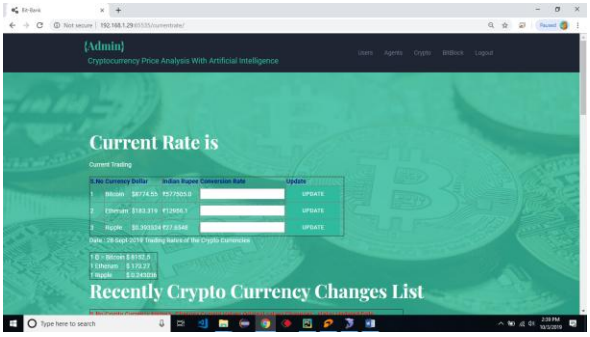
Admin Login Page



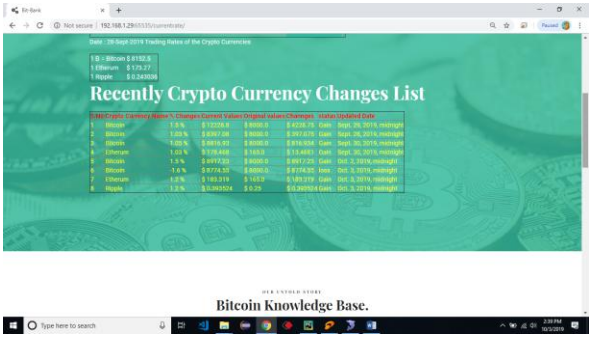
Admin Activate Users



Admin Activate Agents



Current Price and Update



Crypto update history

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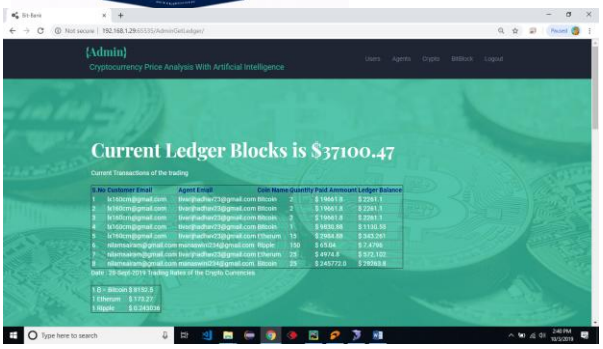
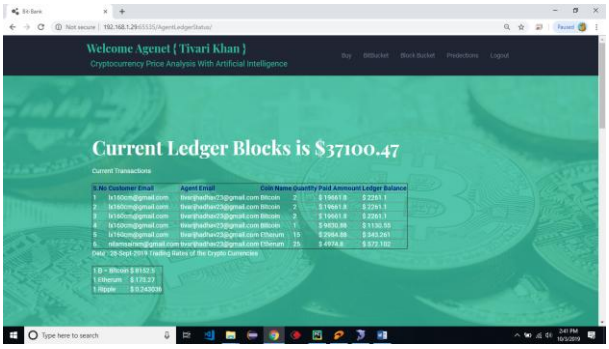
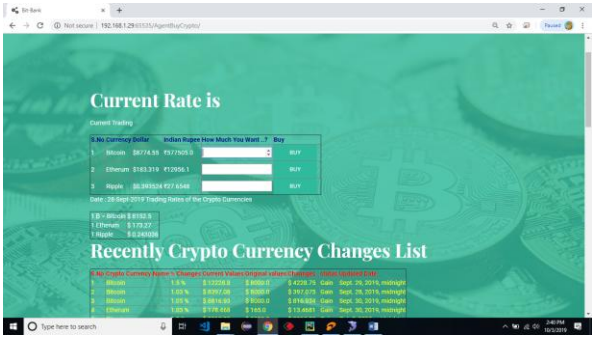


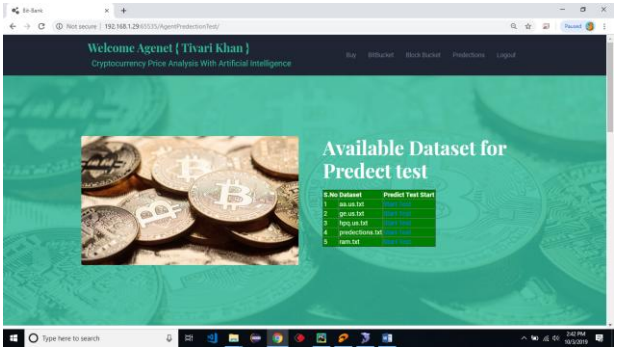
Blockchain ledger maintance



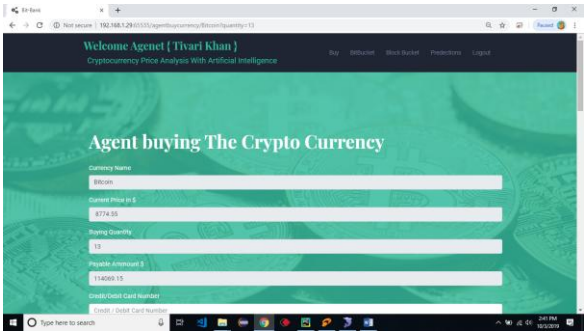
Agent view Ledger balance



Agent buting crypto coins

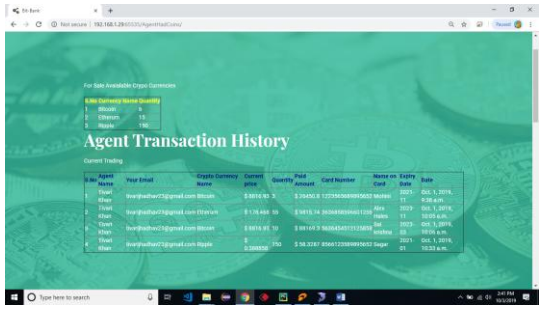


Agent view predections dataset for test

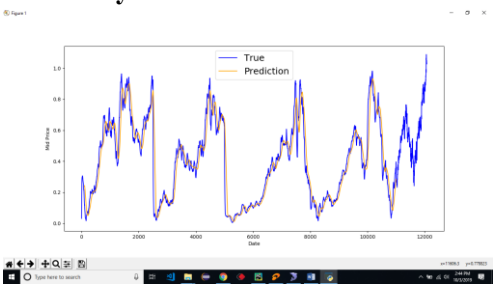


Agent buy Transactions

Dataset analysis



Agent transaction history



True Predections

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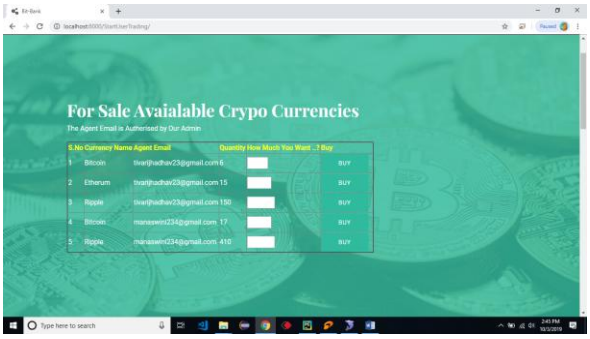
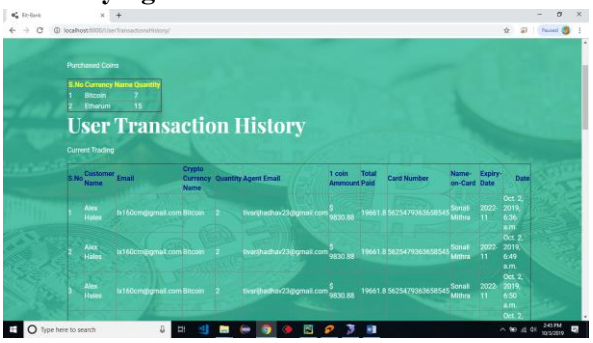
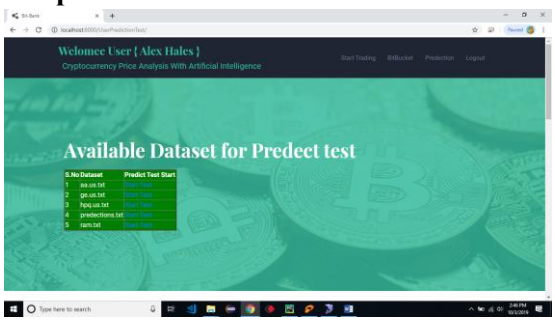
Predectins



User buying coins



User purchased Coins



VI. CONCLUSION

This study presented an Artificial Intelligence-based framework for cryptocurrency price analysis and forecasting. The proposed approach leverages machine learning and deep learning techniques to analyze historical market data, trading patterns, sentiment indicators, and blockchain-related information for predicting cryptocurrency price movements. Experimental observations indicate that AI-driven models effectively capture complex market behaviors and provide more accurate forecasts compared to traditional analytical methods. Furthermore, the ability of Artificial Intelligence systems to process large volumes of structured and unstructured data enhances market trend identification and supports informed investment decisions. The proposed framework contributes to improved financial analysis, risk management, and strategic planning within cryptocurrency markets. As digital assets continue to evolve, AI-based analytical systems will play an increasingly important role in understanding market dynamics and supporting intelligent trading strategies. Future research may focus on integrating real-time sentiment analysis, transformer-based architectures, explainable artificial intelligence, and multi-cryptocurrency forecasting models to further improve prediction accuracy and adaptability in highly volatile cryptocurrency environments.

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