A

Major project

On

CRYPTOCURRENCY PRICE ANALYSIS USING AI

(Submitted in partial fulfillment of the requirements for the award of Degree)
BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

By

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CMR TECHNICAL CAMPUS
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Kandlakoya (V), Medchal Road, Hyderabad-501401
2017-2021

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATE

This is to certify that the project entitled "**CRYPTOCURRENCY PRICE ANALYSIS USING AI**" being submitted by **T.MANASA(177R1A0557),M.RISHITHA(177R1A0532),D.VINUTNA (177R1A0524),**in partial fulfillment of the requirements for the award of the degree of B.Tech in Computer Science and Engineering of the Jawaharlal Nehru Technological University Hyderabad, during the year 2020-2021.It is certified that they have completed the project satisfactorily.

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Submitted for viva voce Examination held on _____

ACKNOWLEDGEMENT

Apart from the efforts of us, the success of any project depends largely on the encouragement and guidelines of many others. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project. We take this opportunity to express my profound gratitude and deep regard to my guide

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ABSTRACT

Cryptocurrency is playing an increasingly important role in reshaping the financial system due to its growing popular appeal and merchant acceptance. While many people are making investments in Cryptocurrency, the dynamical features, uncertainty, the predictability of Cryptocurrency are still mostly unknown, which dramatically risk the investments. It is a matter to try to understand the factors that influence the value formation. In this study, we use advanced 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, Ethereum, and Ripple. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This study provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model.

1.INTRODUCTION

Cryptocurrency is the peer-to-peer digital money and payment system that exist online via a controlled algorithm. When a miner cracks an algorithm to record a block of transactions to public ledger named block-chain and the cryptocurrency is created when the block is added to the block-chain. 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 capitalization 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 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 cryptographic proof rather 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. 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 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 exchange 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 hypothesis 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.

2.LITERATURE SURVEY

2.1. USING THE BITCOIN TRANSACTION GRAPH TO PREDICT THE PRICE OF BITCOIN

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

Bitcoin is the world's leading cryptocurrency, allowing users to make transactions securely and anonymously over the Internet. In recent years, The Bitcoin the ecosystem has gained the attention of consumers, businesses, investors and speculators alike. While there has been significant research done to analyze the network topology of the Bitcoin network, limited research has been performed to analyze the network's influence on 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 chockablock-networkbased feature engineering and machine learning optimization, we obtain up-down Bitcoin price movement classification accuracy of roughly 55%.

2.2 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 break even 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.

2.3. 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

2.4. 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 approximates 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 trade-offs in parameter selection, some common pitfalls, and points of disagreement among practitioners.

2.5 SOFTWARE ENVIRONMENT

PYTHON

Python is a general-purpose interpreted, interactive, object-oriented, and high-level programming language. An interpreted language, Python has a design philosophy that emphasizes code readability (notably using whitespace indentation to delimit code blocks rather than curly brackets or keywords), and a syntax that allows programmers to express concepts in fewer lines of code than might be used in languages such as C++or Java. It provides constructs that enable clear programming on both small and large scales. Python interpreters are available for many operating systems. CPython, the reference implementation of Python, is open source software and has a community-based development model, as do nearly all of its variant implementations. CPython is managed by the non-profit Python Software Foundation. Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object-oriented, imperative, functional and procedural, and has a large and comprehensive standard library.

Interactive Mode Programming

Invoking the interpreter without passing a script file as a parameter brings up the following prompt −

$ python

Python 2.4.3 (#1, Nov 11 2010, 13:34:43)

[GCC 4.1.2 20080704 (Red Hat 4.1.2-48)] on linux2

Type "help", "copyright", "credits" or "license" for more information.

>>>

Type the following text at the Python prompt and press the Enter −

>>> print "Hello, Python!"

If you are running new version of Python, then you would need to use print statement with parenthesis as in print ("Hello, Python!");. However in Python version 2.4.3, this produces the following result −

Hello, Python!

Script Mode Programming

Invoking the interpreter with a script parameter begins execution of the script and continues until the script is finished. When the script is finished, the interpreter is no longer active.

Let us write a simple Python program in a script. Python files have extension .py. Type the following source code in a test.py file −

Live Demo

```
print "Hello, Python!"
```

We assume that you have Python interpreter set in PATH variable. Now, try to run this program as follows −

```
$ python test.py
```

This produces the following result −

Hello, Python!

Let us try another way to execute a Python script. Here is the modified test.py file −

Live Demo

```
#!/usr/bin/python

print "Hello, Python!"
```

We assume that you have Python interpreter available in /usr/bin directory. Now, try to run this program as follows −

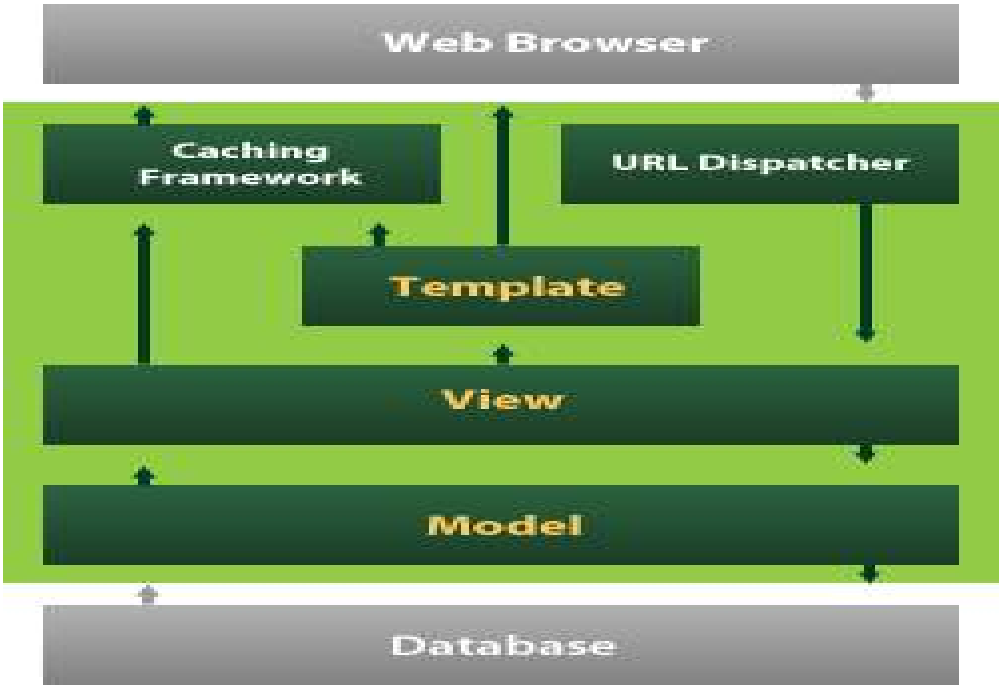
```
$ chmod +x test.py     # This is to make file executable

$./test.py
```

This produces the following result − Hello, Python!

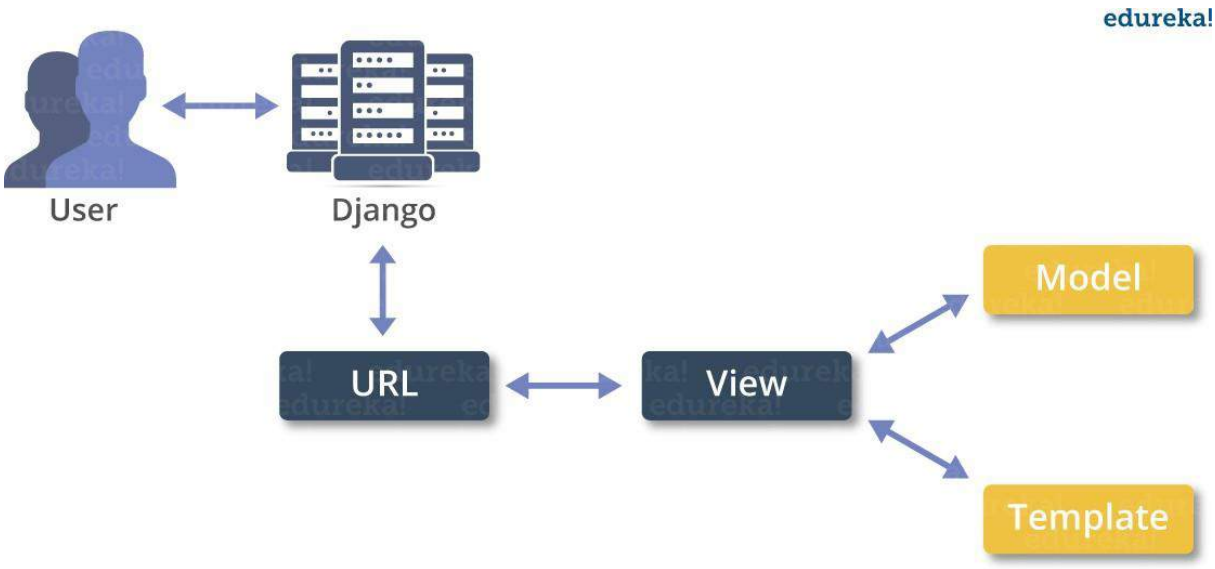
DJANGO

Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design. Built by experienced developers, it takes care of much of the hassle of Web development, so you can focus on writing your app without needing to reinvent the wheel. It’s free and open source.

Django's primary goal is to ease the creation of complex, database-driven websites. Django emphasizes reusabilityand "pluggability" of components, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings files and data models.



Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models



Create a Project

Whether you are on Windows or Linux, just get a terminal or a cmd prompt and navigate to the place you want your project to be created, then use this code −

$ django-admin startproject myproject

This will create a "myproject" folder with the following structure −

myproject/

manage.py

myproject/

__init_.py

settings.py

urls.py

wsgi.py

The Project Structure

The “myproject” folder is just your project container, it actually contains two elements −

manage.py − This file is kind of your project local django-admin for interacting with your project via command line (start the development server, sync db...). To get a full list of command accessible via manage.py you can use the code −

$ python manage.py help

The “myproject” subfolder − This folder is the actual python package of your project. It contains four files −

__init_.py − Just for python, treat this folder as package.

settings.py − As the name indicates, your project settings.

urls.py − All links of your project and the function to call. A kind of ToC of your project

wsgi.py − If you need to deploy your project over WSGI.

Setting Up Your Project

Your project is set up in the subfolder myproject/settings.py. Following are some important options you might need to set −

DEBUG = True

This option lets you set if your project is in debug mode or not. Debug mode lets you get more information about your project's error. Never set it to ‘True’ for a live project. However, this has to be set to ‘True’ if you want the Django light server to serve static files. Do it only in the development mode.

```
DATABASES = {
  'default': {
    'ENGINE': 'django.db.backends.sqlite3',
    'NAME': 'database.sql',
    'USER': '',
    'PASSWORD': '',
    'HOST': '',
```

```
    'PORT': '',
  }
}
```

Database is set in the ‘Database’ dictionary. The example above is for SQLite engine. As stated earlier, Django also supports −

MySQL (django.db.backends.mysql)

PostGreSQL (django.db.backends.postgresql_psycopg2)

Oracle (django.db.backends.oracle) and NoSQL DB

MongoDB (django_mongodb_engine)

Before setting any new engine, make sure you have the correct db driver installed.

You can also set others options like: TIME_ZONE, LANGUAGE_CODE, TEMPLATE…

Now that your project is created and configured make sure it's working −

```
$ python manage.py runserver
```

You will get something like the following on running the above code −

```
Validating models...

0 errors found

September 03, 2015 - 11:41:50

Django version 1.6.11, using settings 'myproject.settings'

Starting development server at http://127.0.0.1:8000/

Quit the server with CONTROL-C.
```

A project is a sum of many applications. Every application has an objective and can be reused into another project, like the contact form on a website can be an application, and can be reused for others. See it as a module of your project.

Create an Application

We assume you are in your project folder. In our main “myproject” folder, the same folder then manage.py −

$ python manage.py startapp myapp

You just created myapp application and like project, Django create a “myapp” folder with the application structure −

myapp/

__init_.py

admin.py

models.py

tests.py

views.py

__init_.py − Just to make sure python handles this folder as a package.

admin.py − This file helps you make the app modifiable in the admin interface.

models.py − This is where all the application models are stored.

tests.py − This is where your unit tests are.

views.py − This is where your application views are.

Get the Project to Know About Your Application

At this stage we have our "myapp" application, now we need to register it with our Django project "myproject". To do so, update INSTALLED_APPS tuple in the settings.py file of your project (add your app name) −

INSTALLED_APPS = (

'django.contrib.admin',

```
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.messages',
    'django.contrib.staticfiles',
    'myapp',
)
```

Creating forms in Django, is really similar to creating a model. Here again, we just need to inherit from Django class and the class attributes will be the form fields. Let's add a forms.py file in myapp folder to contain our app forms. We will create a login form.

myapp/forms.py

```
#-*- coding: utf-8 -*-p
from django imort forms
class LoginForm(forms.Form):
    user = forms.CharField(max_length = 100)
    password = forms.CharField(widget = forms.PasswordInput())
```

As seen above, the field type can take "widget" argument for html rendering; in our case, we want the password to be hidden, not displayed. Many others widget are present in Django: DateInput for dates, CheckboxInput for checkboxes, etc.

Using Form in a View

There are two kinds of HTTP requests, GET and POST. In Django, the request object passed as parameter to your view has an attribute called "method" where the type of the request is set, and all data passed via POST can be accessed via the request.POST dictionary.

Let's create a login view in our myapp/views.py −

```
#-*- coding: utf-8 -*-
from myapp.forms import LoginForm
def login(request):
  username = "not logged in"
  if request.method == "POST":
    #Get the posted form
    MyLoginForm = LoginForm(request.POST)
    if MyLoginForm.is_valid():
      username = MyLoginForm.cleaned_data['username']
  else:
    MyLoginForm = Loginform()
  return render(request, 'loggedin.html', {"username" : username})
```

3.FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are,

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

3.1 ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

3.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

3.3 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

4.SYSTEM REQUIREMENTS

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

5. SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE:

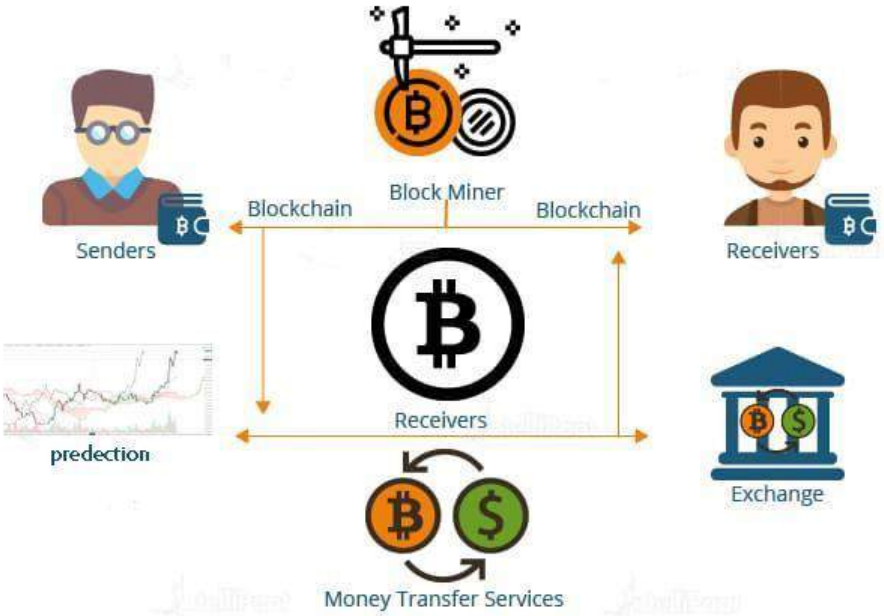


FIG 5.1.1 SYSTEM ARCHITECTURE

5.2 DATA FLOW DIAGRAM:

1. The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.
2. The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are 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. DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.
4. DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.

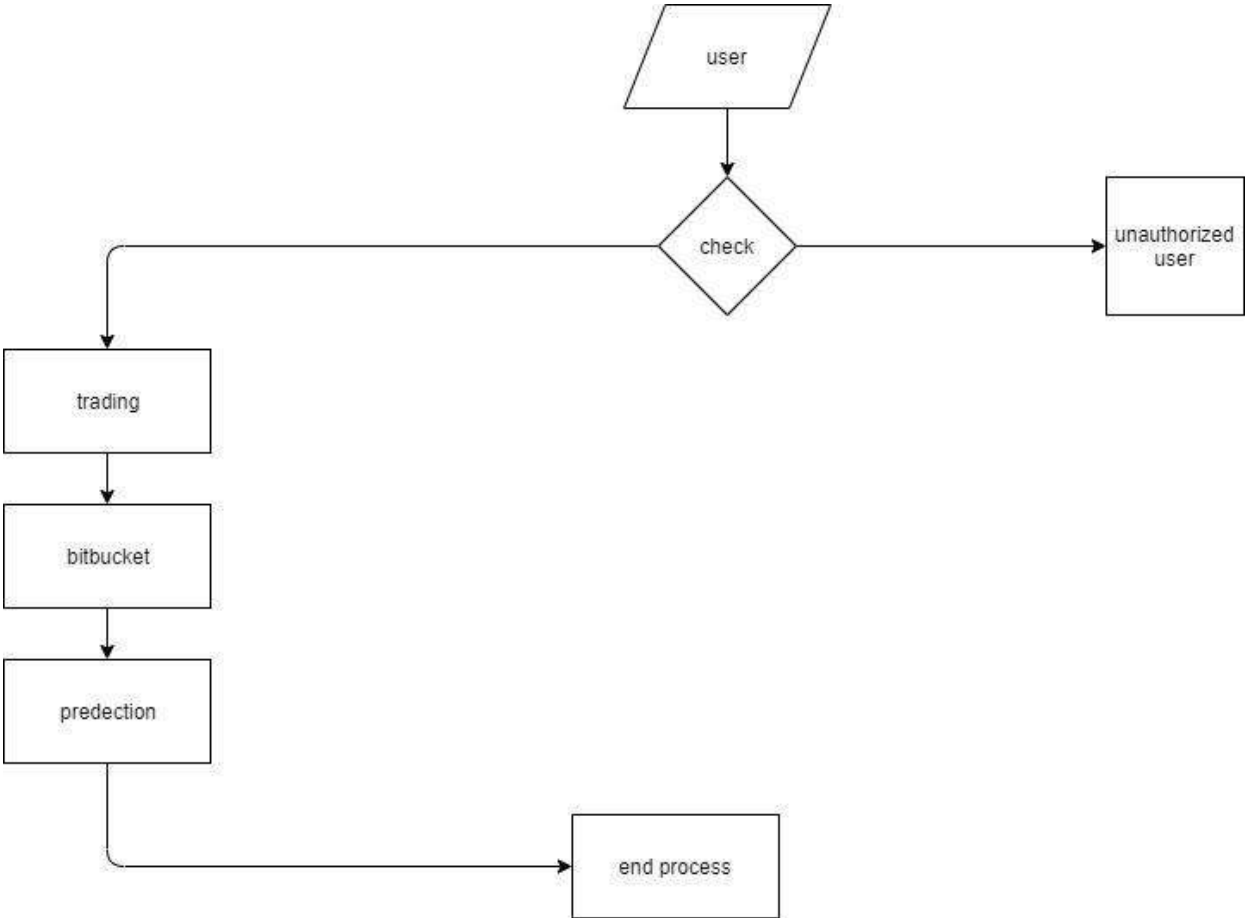


FIG 5.2.1 ZERO LEVEL DATAFLOW DIAGRAM

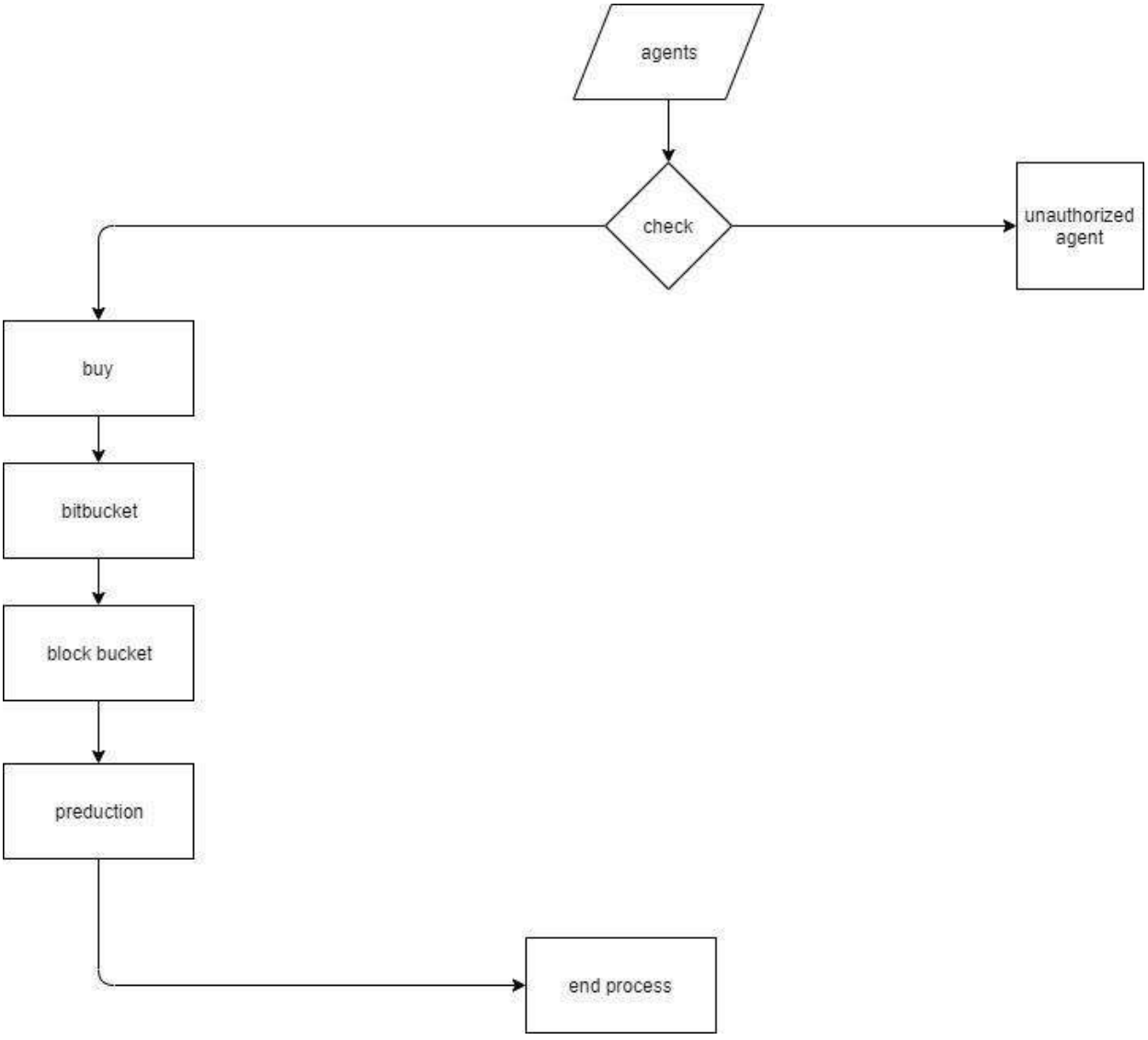

agents
check
unauthorized agent
buy
bitbucket
block bucket
preduction
end process

FIG 5.2.2 FIRST LEVEL DATAFLOW DIAGRAM

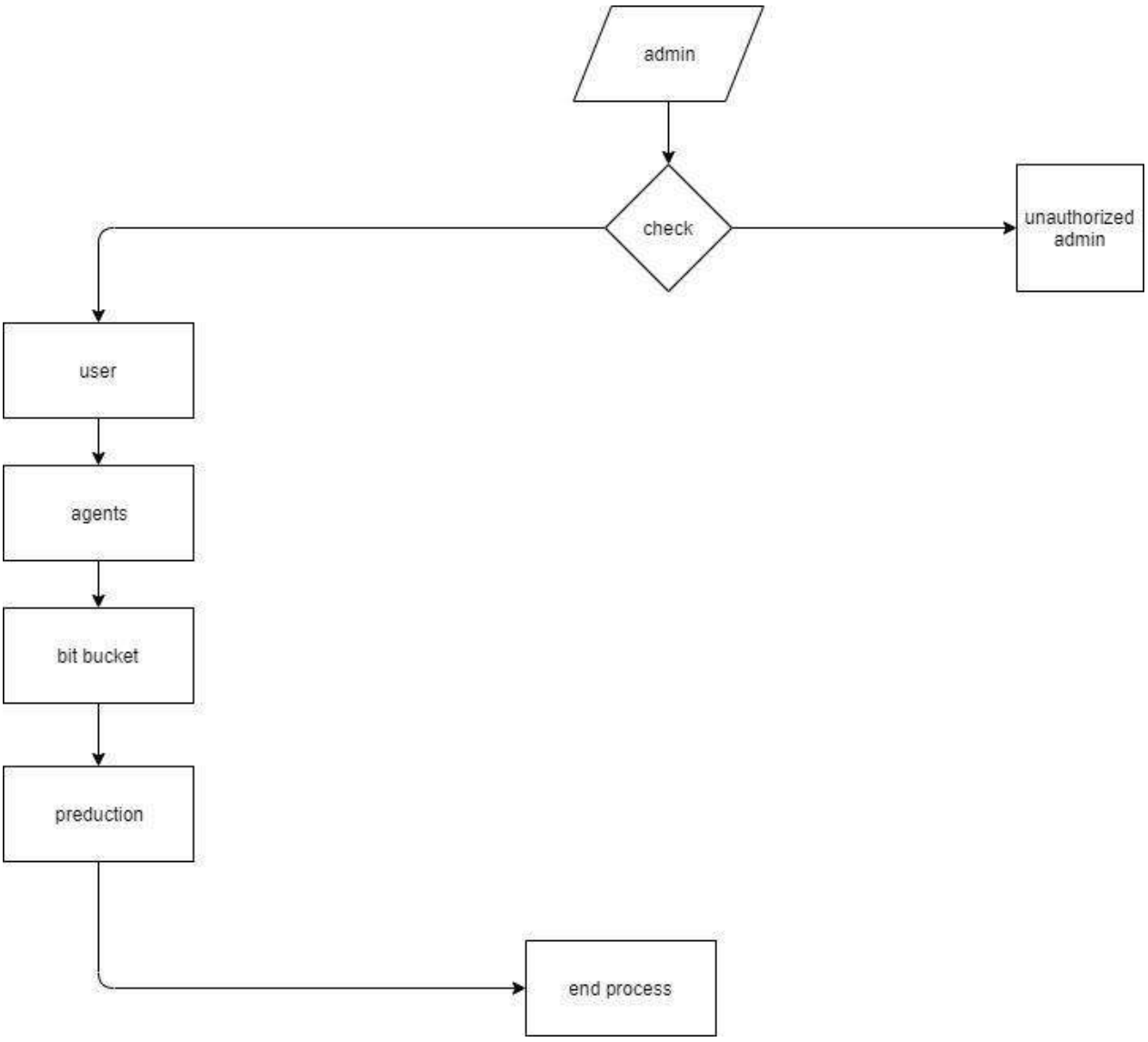


FIG 5.2.3 SECOND LEVEL DATA FLOW DIAGRAM

5.3 UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

GOALS:

The Primary goals in the design of the UML are as follows:

1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extensibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Encourage the growth of OO tools market.
6. Support higher level development concepts such as collaborations, frameworks, patterns and components.
7. Integrate best practices.

.

USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.

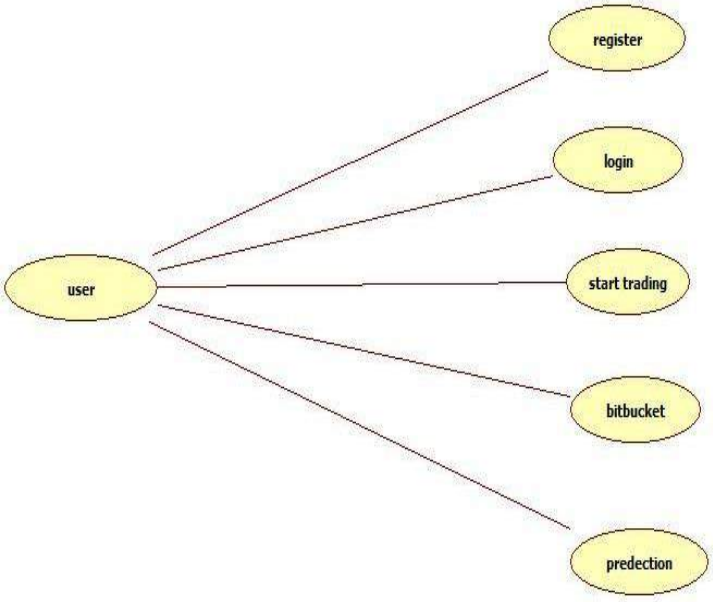


FIG 5.3.1 USER USECASE DIAGRAM

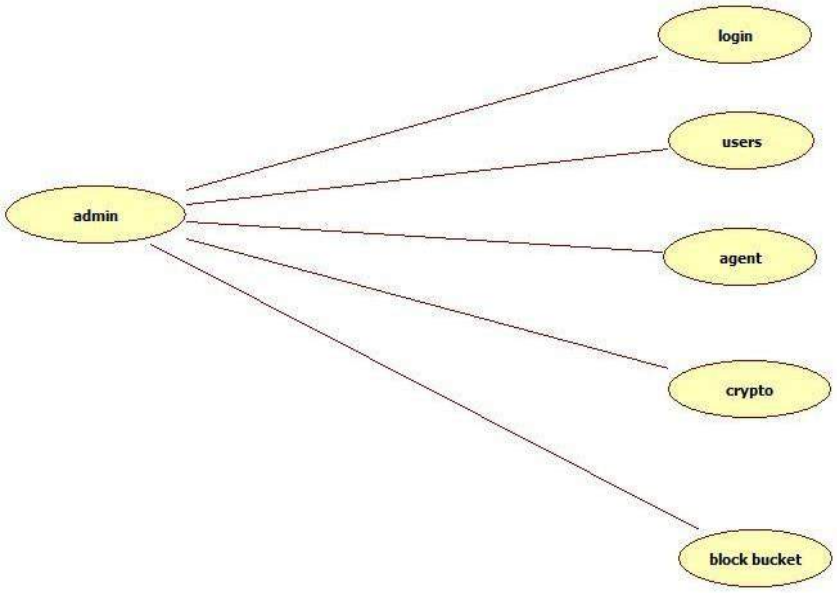


FIG 5.3.2 ADMIN USECASE DIAGRAM

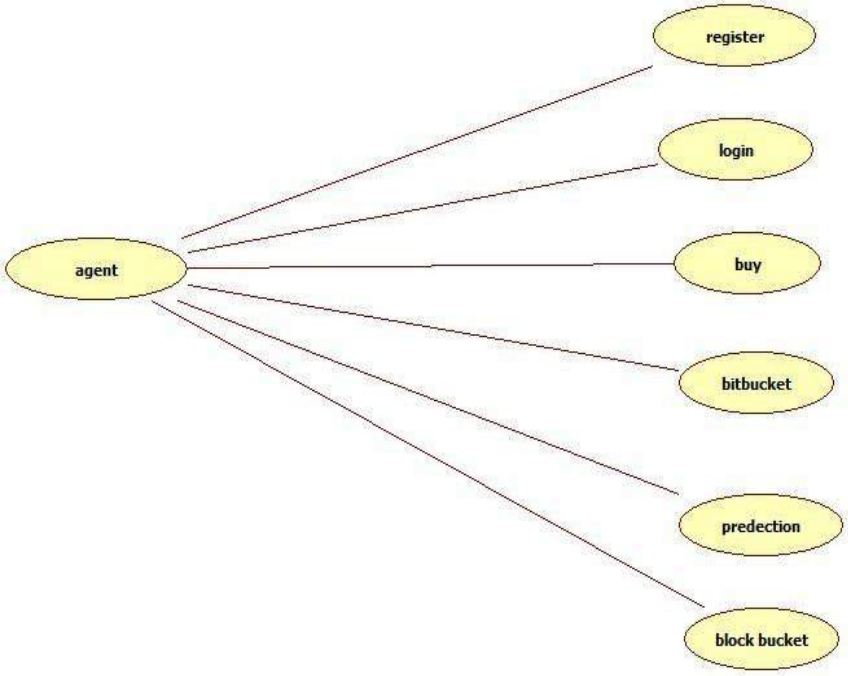


FIG 5.3.3 AGENT USECASE DIAGRAM

CLASS DIAGRAM:

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information.

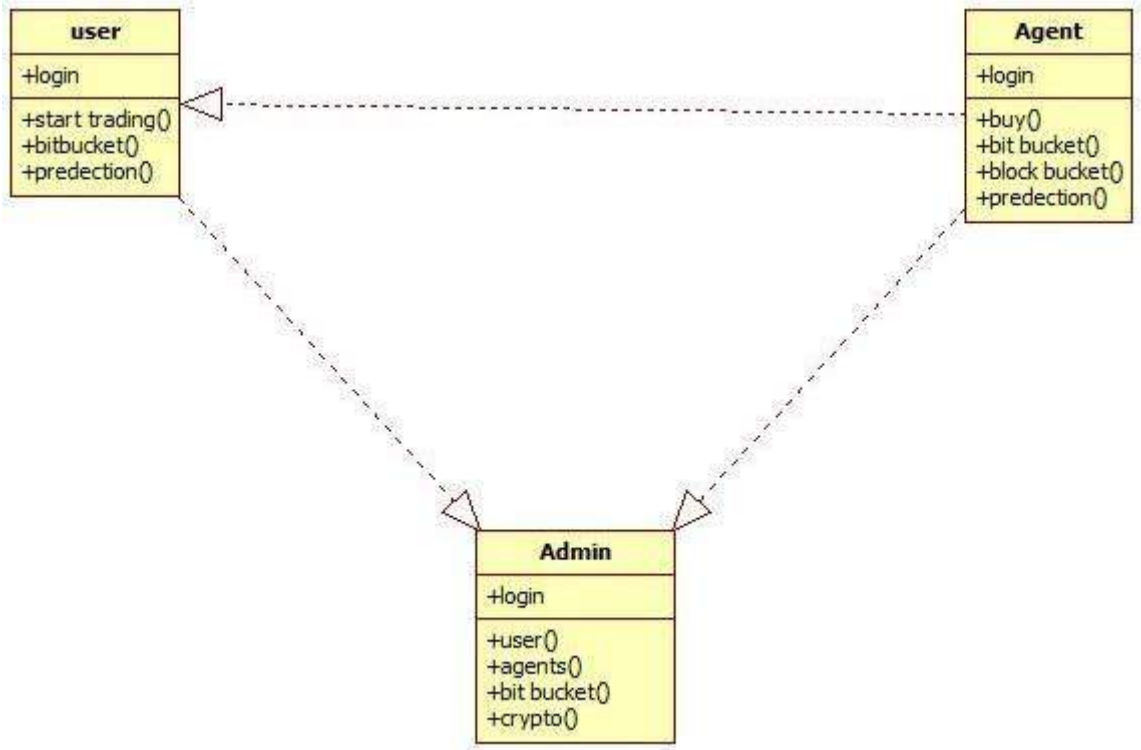


FIG 5.3.4 CLASS DIAGRAM

SEQUENCE DIAGRAM:

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

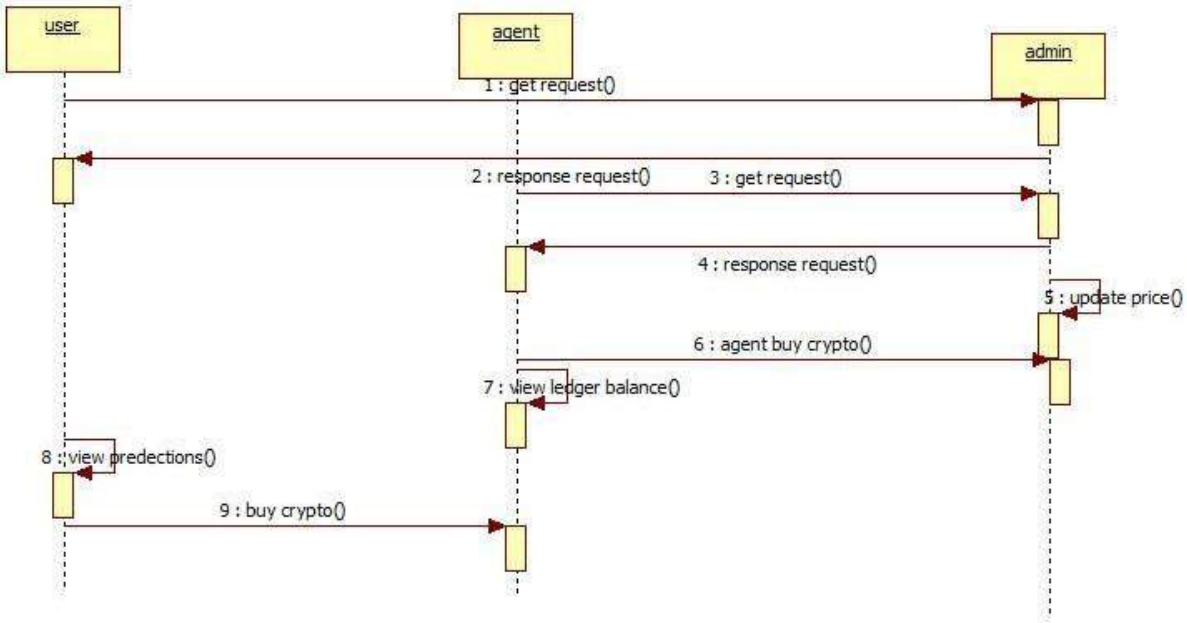


FIG 5.3.5 SEQUENCE DIAGRAM

ACTIVITY DIAGRAM:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.

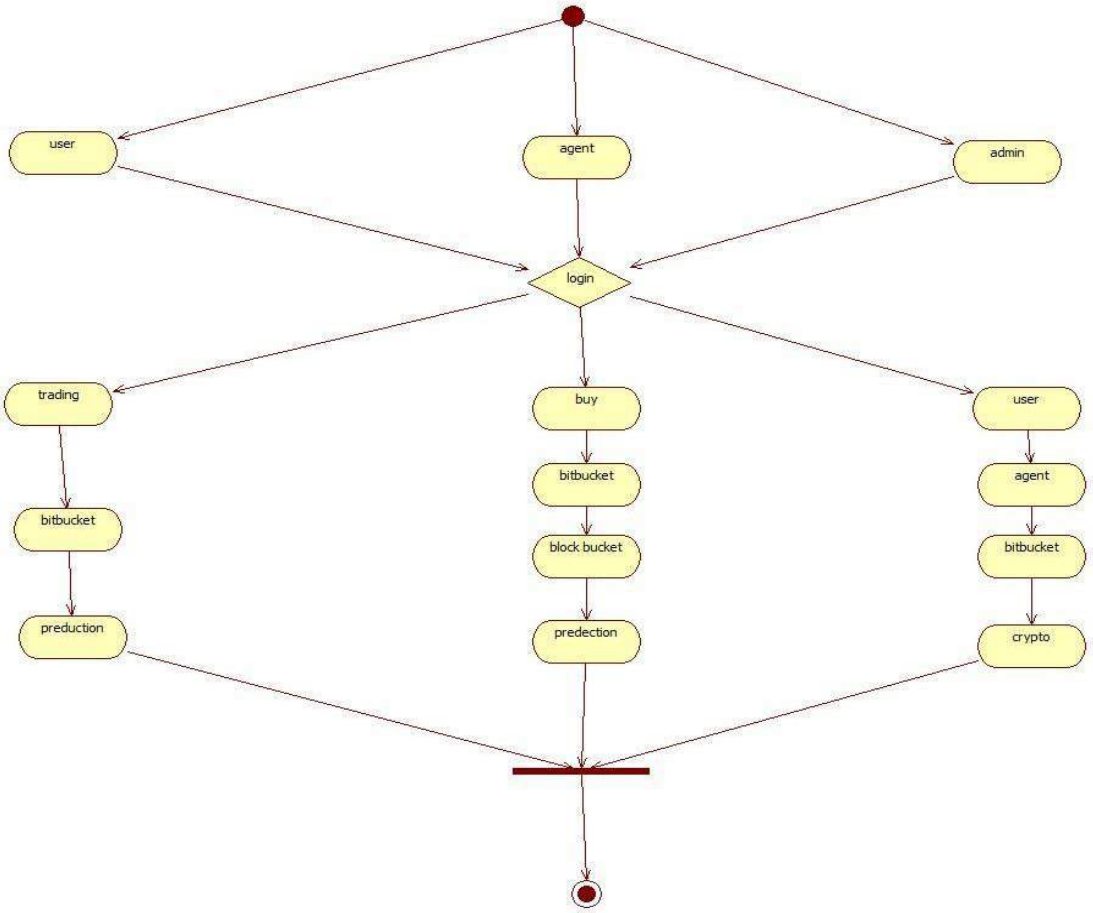


FIG 5.3.6 ACTIVITY DIAGRAM

6. IMPLEMETATION

6.1 MODULES:

- User
- Agent
- Admin
- Artificial Intelligence

User

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.

Agent

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 [6, 7], 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.

Admin

The aim of admin is to approve the users and agents . When a miner cracks an algorithm 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 capitalization 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 decentralization 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 .

6.2 SAMPLE CODE

Admin side

models.py from

```
django.db import models
import datetime
from django.utils import timezone
# Create your models here.
class cryptcurrencyratemodel(models.Model):
    currencytype=models.CharField(max_length=100, primary_key=True)
    doller=models.FloatField()
    rupee=models.FloatField()
    originalprice = models.FloatField()
    def__str_(self):
        return self.currencytype
    class Meta:
        db_table = 'currencyrate'
class CurrencyUpdateModel(models.Model):
    id = models.AutoField(primary_key=True)
    currencyname = models.CharField(max_length=100)
    conversionRate = models.FloatField()
    newCurrencyValue = models.FloatField()
    originalCurrencyValue = models.FloatField()
    chnageValue = models.FloatField()
    profitorloss = models.CharField(max_length=50)
    changedate = models.DateTimeField()
```

```
        return self.currencyname

    class Meta:

        db_table =  'currencychnagetable'

        unique_together = ('currencyname', 'changedate',)
```

Manage.py

```
#!/usr/bin/env python
import os
import sys

if __name__ == '__main__':
    os.environ.setdefault('DJANGO_SETTINGS_MODULE', 'cryptobitcoin.settings')
    try:
        from django.core.management import execute_from_command_line
    except ImportError as exc:
        raise ImportError(
            "Couldn't import Django. Are you sure it's installed and "
            "available on your PYTHONPATH environment variable? Did you "
            "forget to activate a virtual environment?"
        ) from exc
    execute_from_command_line(sys.argv)
```

7.SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

TYPES OF TESTS

Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Testing

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reached from a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot "see" into it. The test provides inputs and responds to outputs without considering how the software works.

7.1 UNIT TESTING

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

7.2 INTEGRATION TESTING

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

7.3 ACCEPTANCE TESTING

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

7.4 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

8.INPUT AND OUTPUT DESIGN

8.1 INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- 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.Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

3.When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

8.2 OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2.Select methods for presenting information.

3.Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- 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.

9.SCREEN SHOTS

Home Page

FIG 9.1 MAIN HOMEPAGE

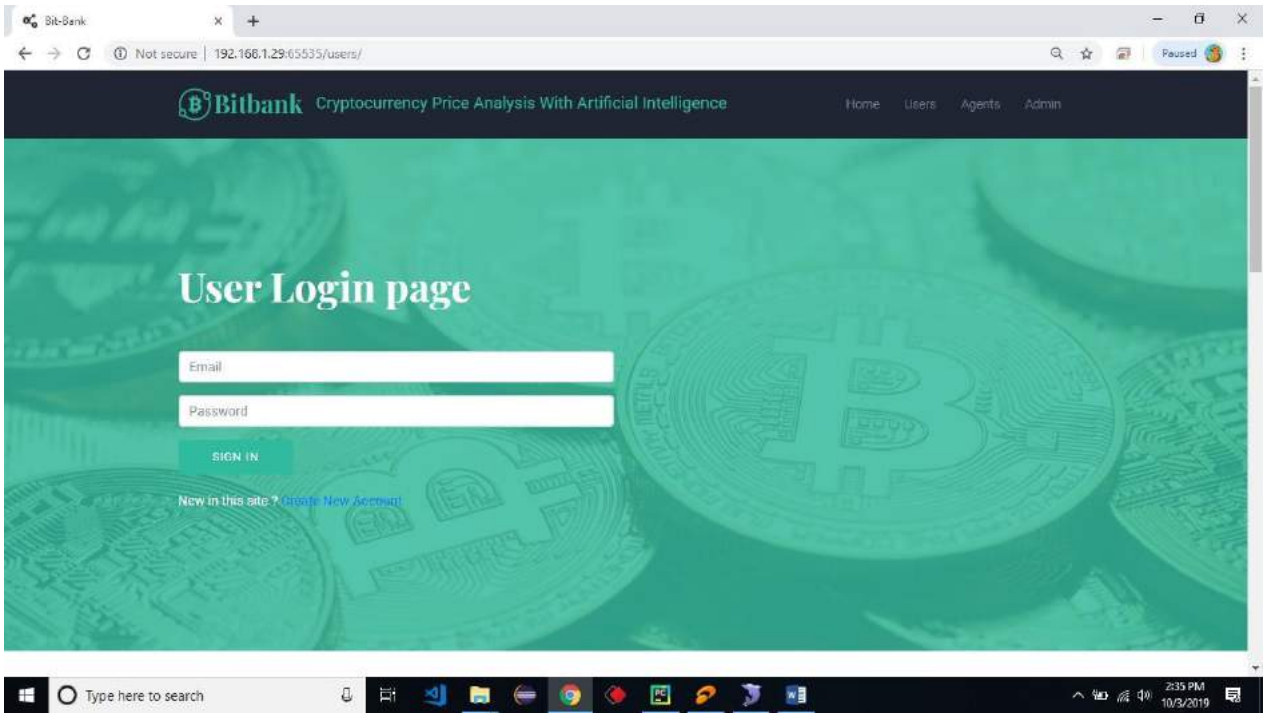


FIG 9.2 USER REGISTER PAGE

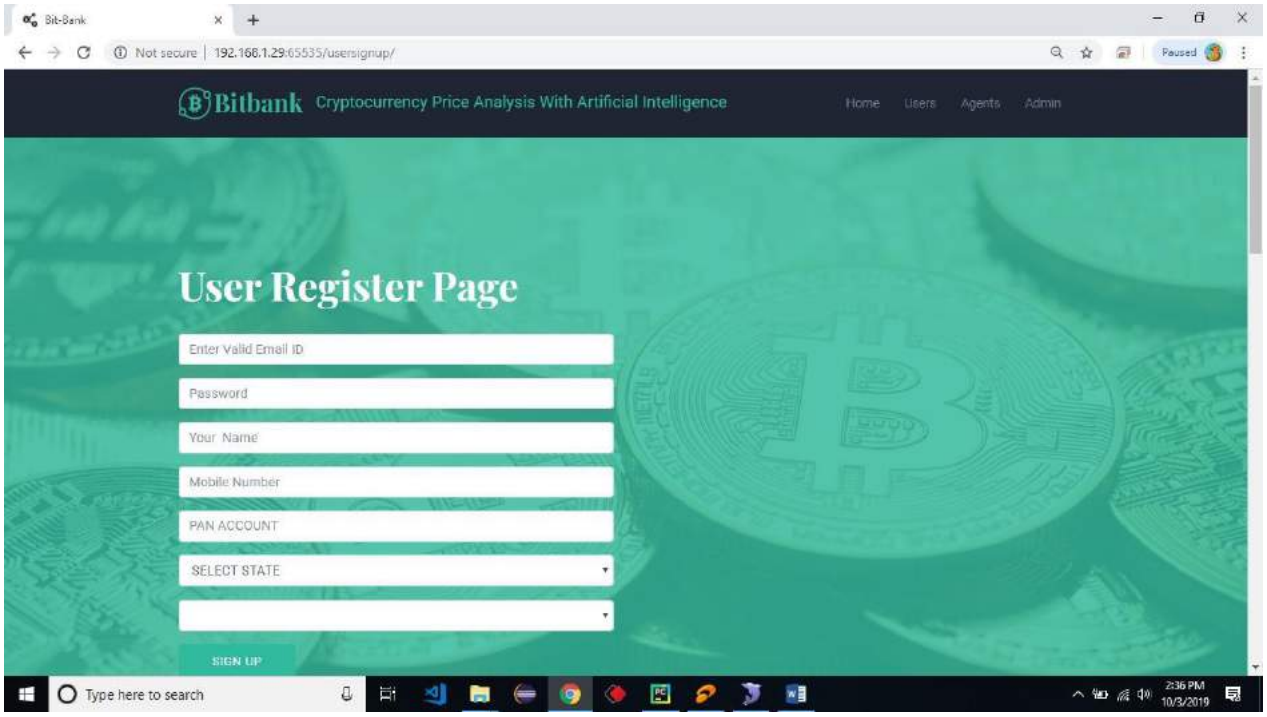


FIG 9.3 USER REGISTRATION FORM

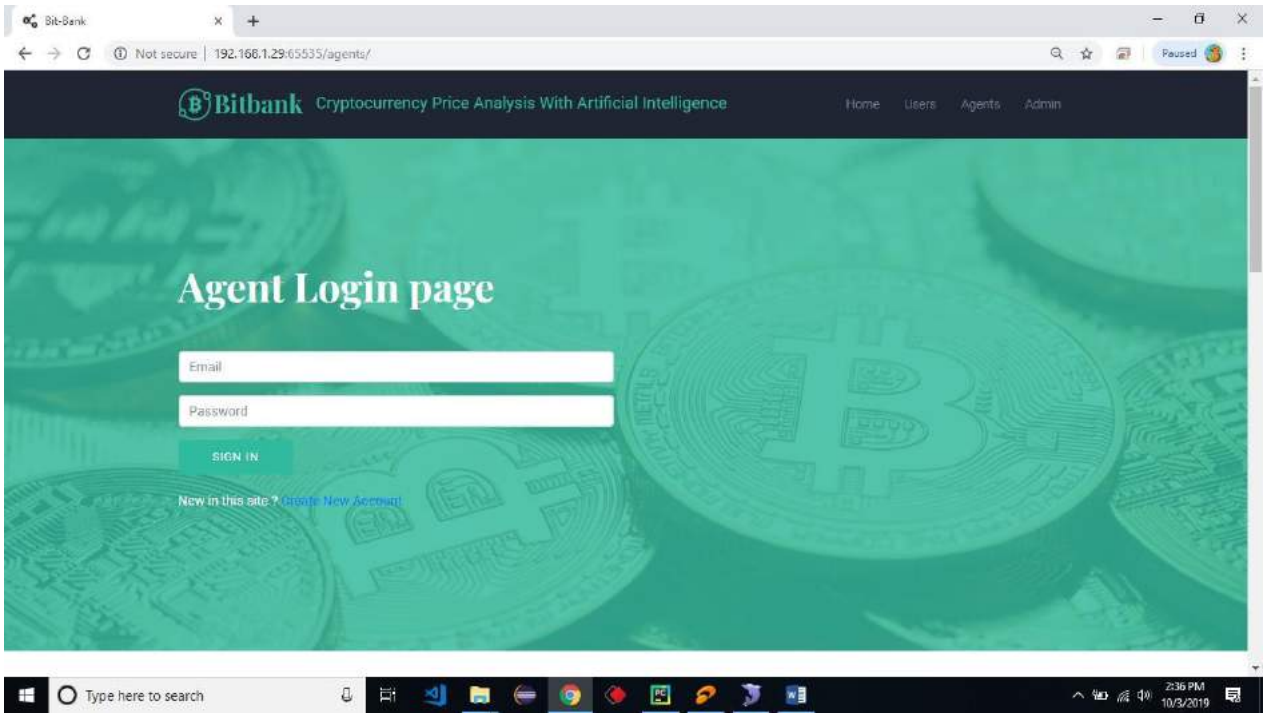


FIG 9.4 AGENT LOGIN PAGE

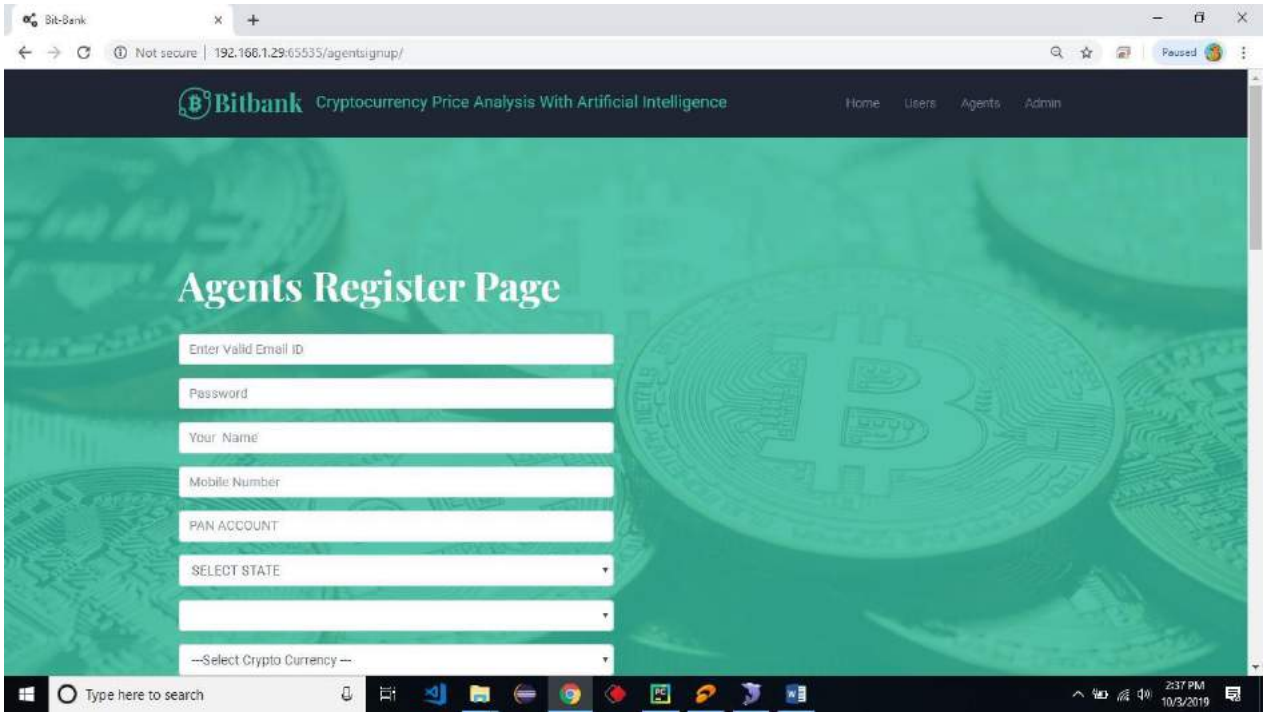


FIG 9.5 AGENT REGISTER PAGE

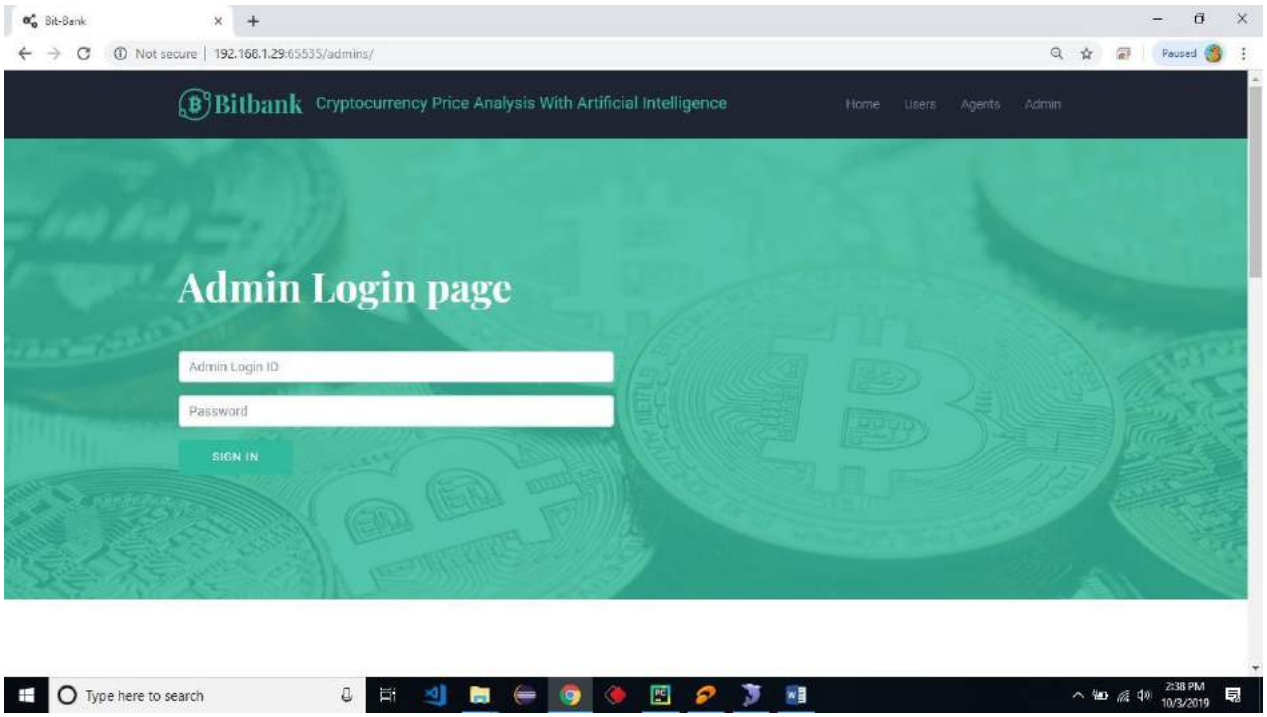


FIG 9.6 ADMIN LOGIN PAGE

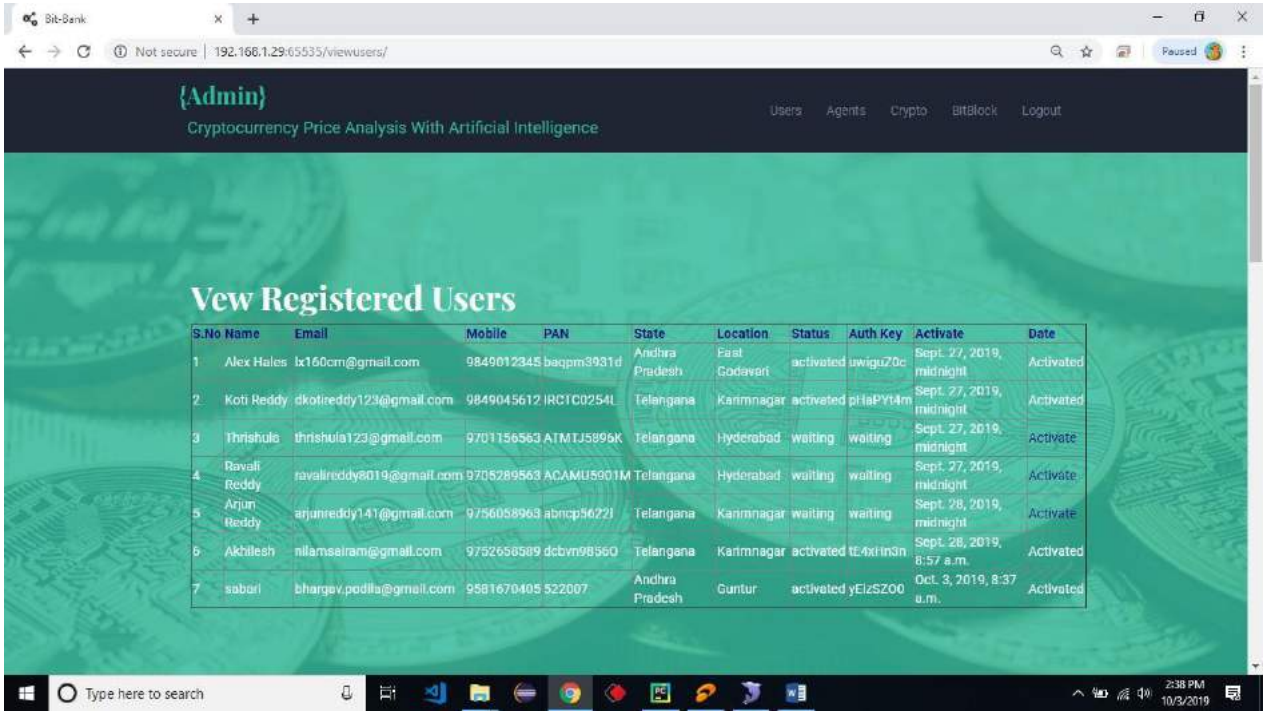


FIG 9.7 ADMIN ACTIVATE USERS

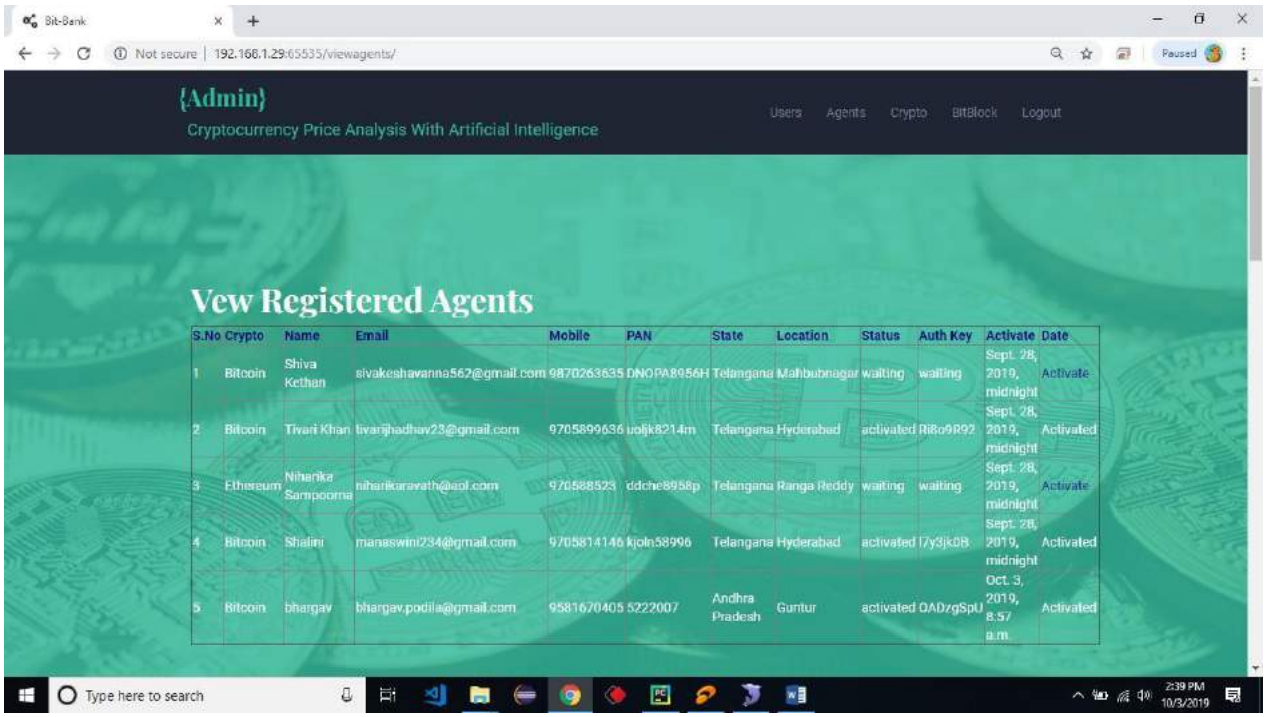


FIG 9.8 ADMIN ACTIVATE AGENTS

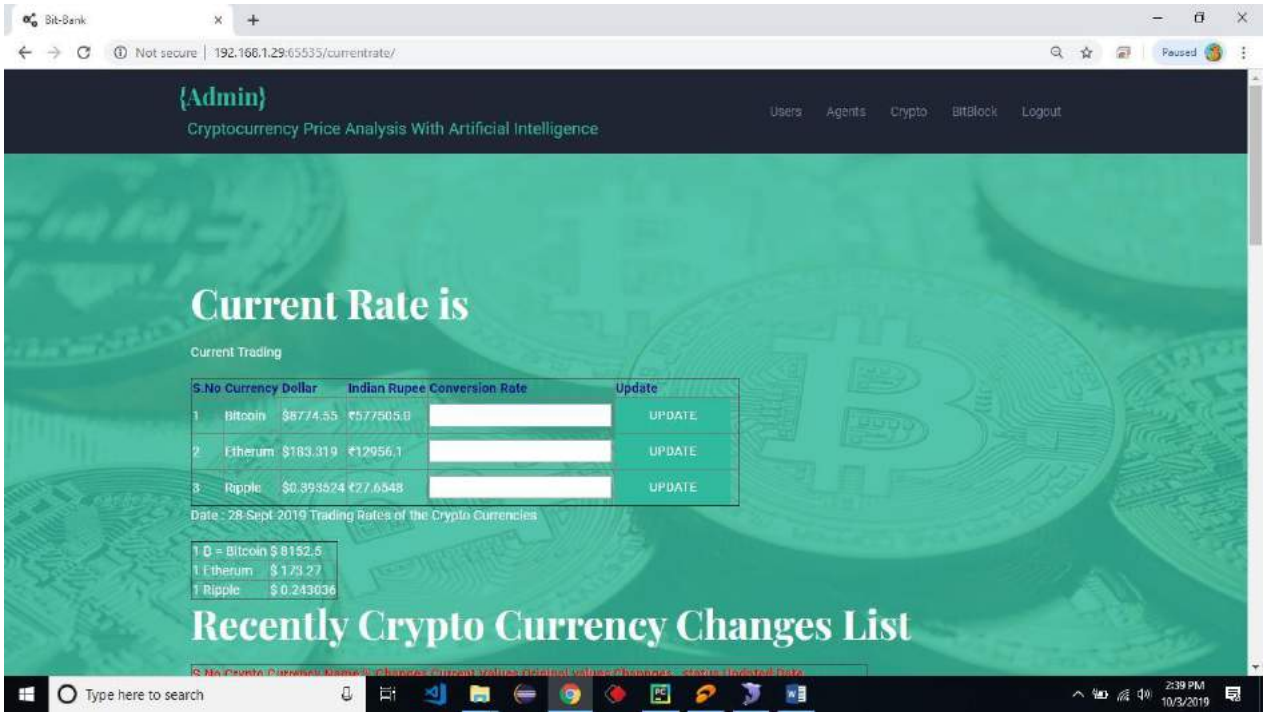


FIG 9.9 CURRENT PRICE AND UPDATE

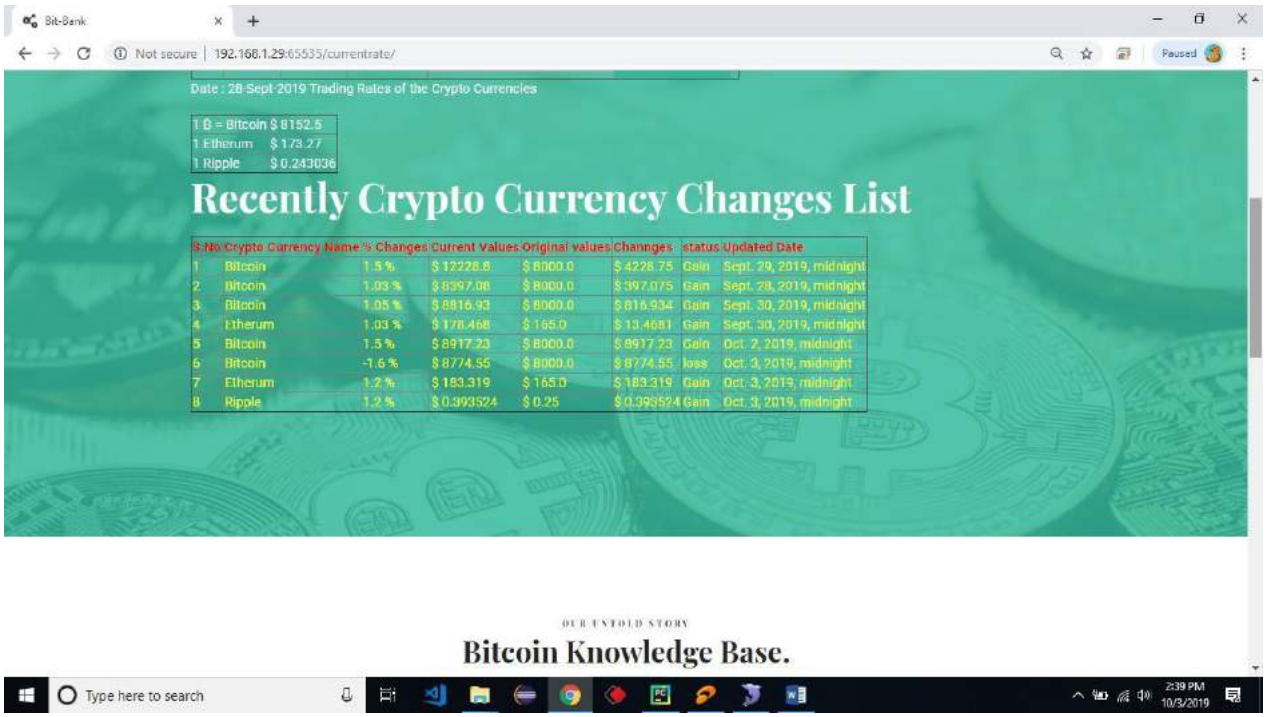


FIG 9.10 CRYPTO UPDATE HISTORY

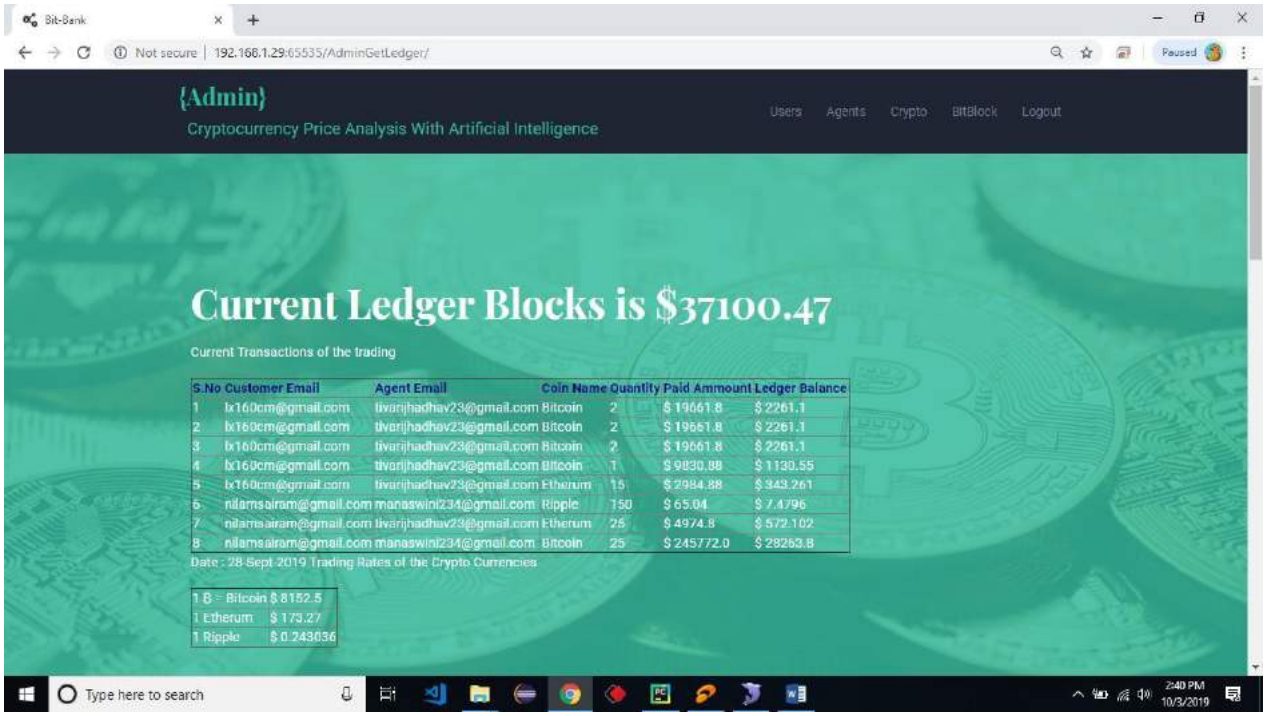


FIG 9.11 BLOCKCHAIN LEDGER MAINTAINANCE

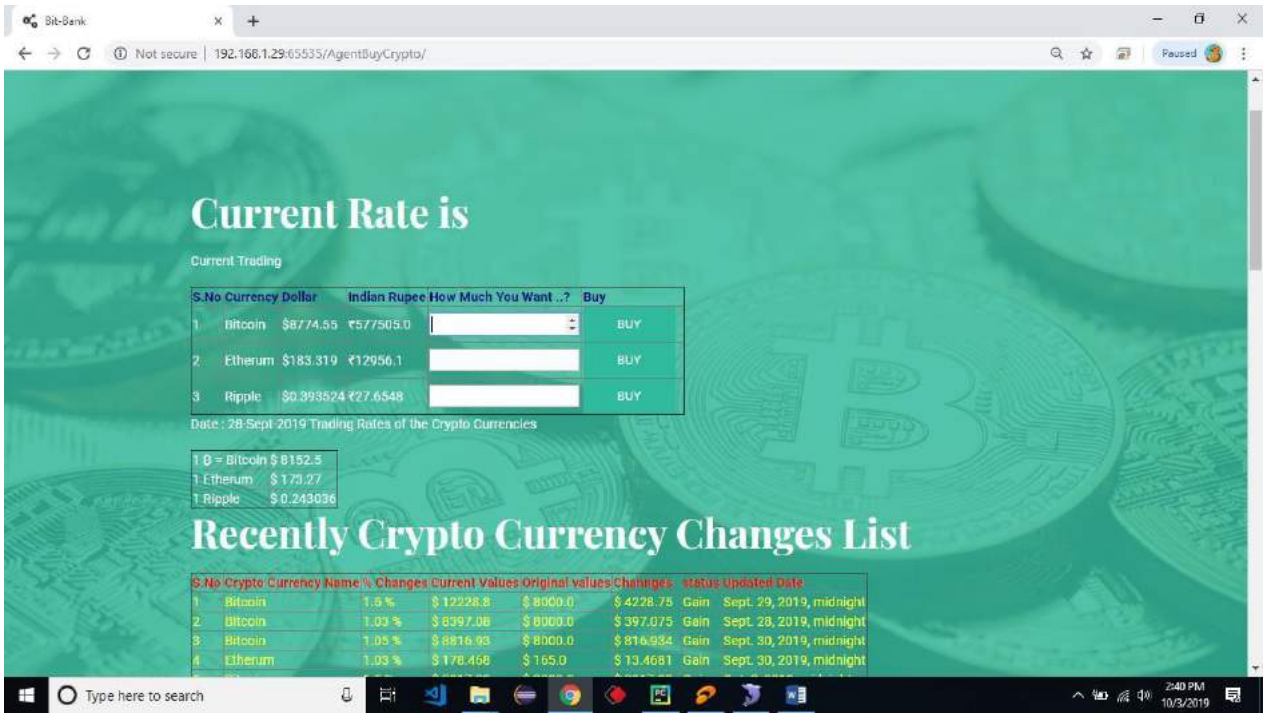


FIG 9.12 CRYPTOCURRENCY CHANGES LIST

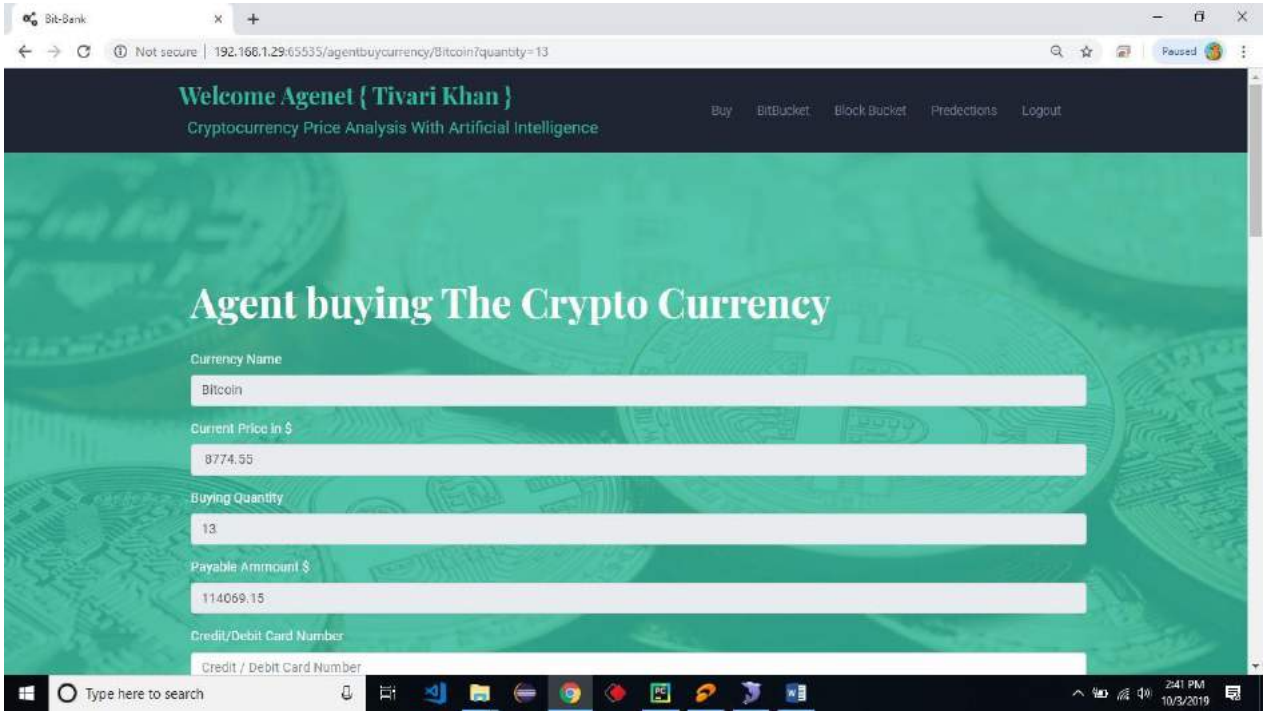


FIG 9.13 AGENT BUY CRYTOCURRENCY

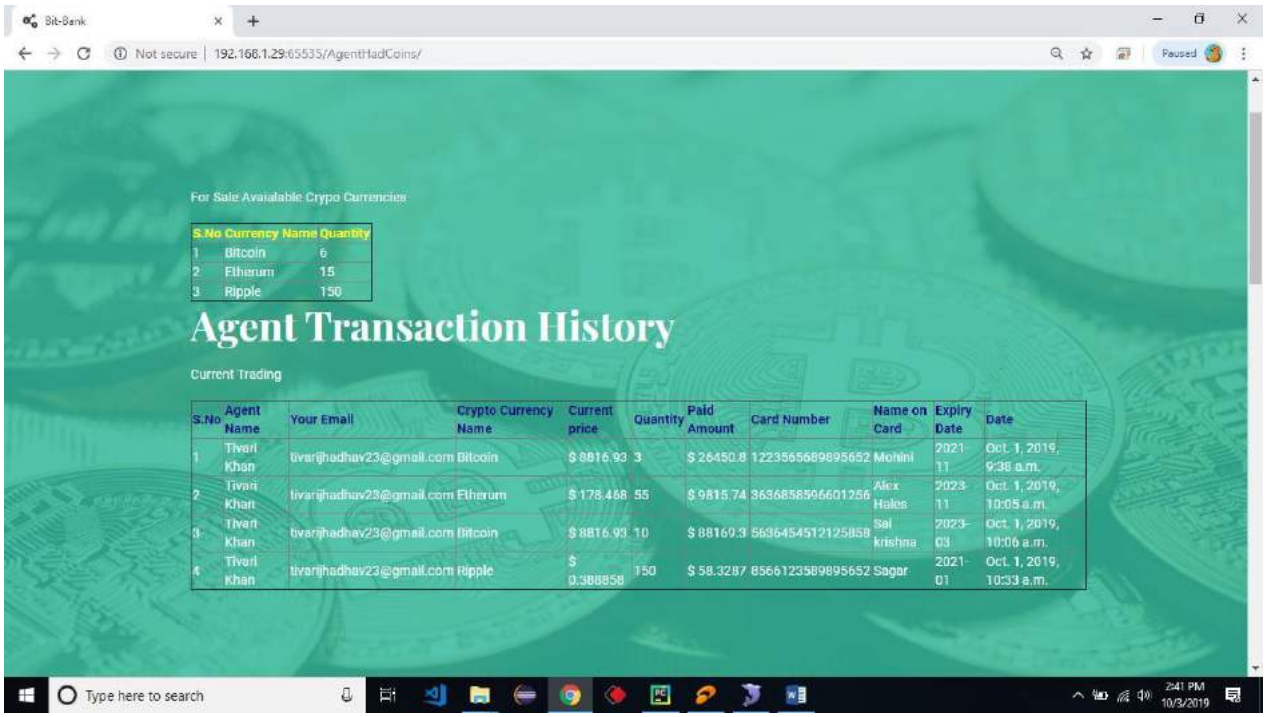


FIG 9.14 AGENT TRANSACTION HISTORY

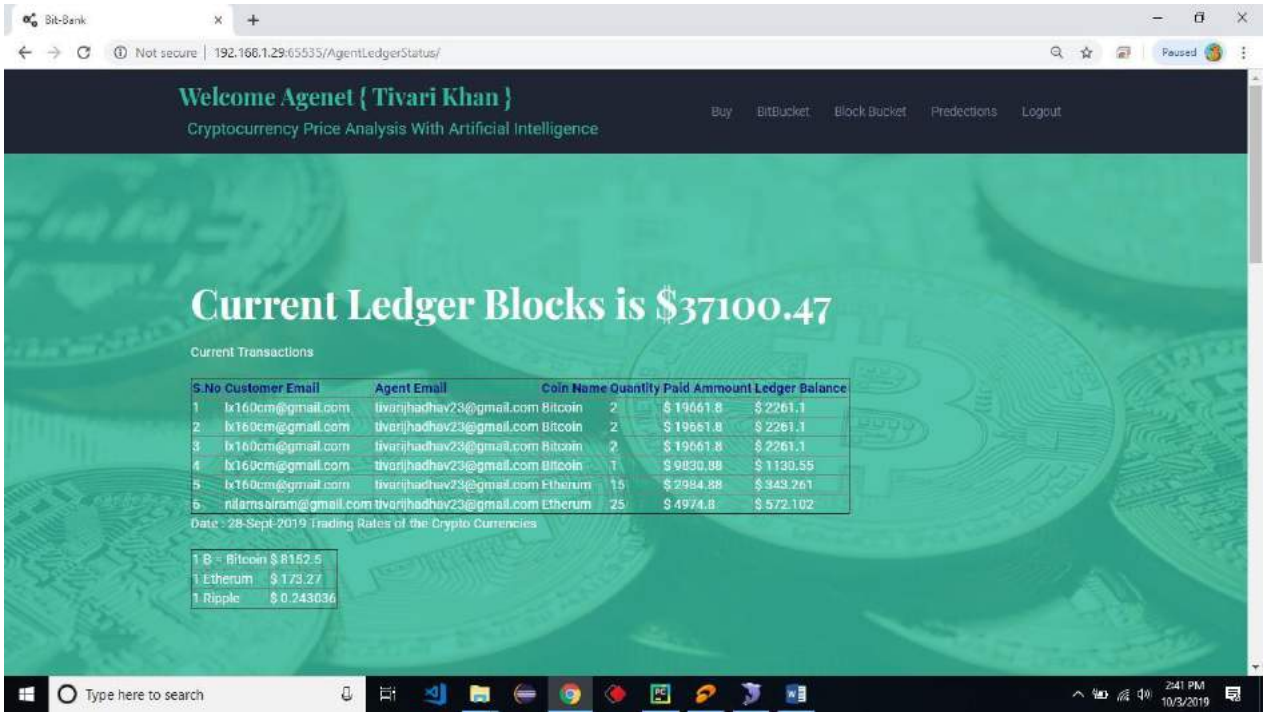


FIG 9.15 AGENT VIEW LEDGER BALANCE

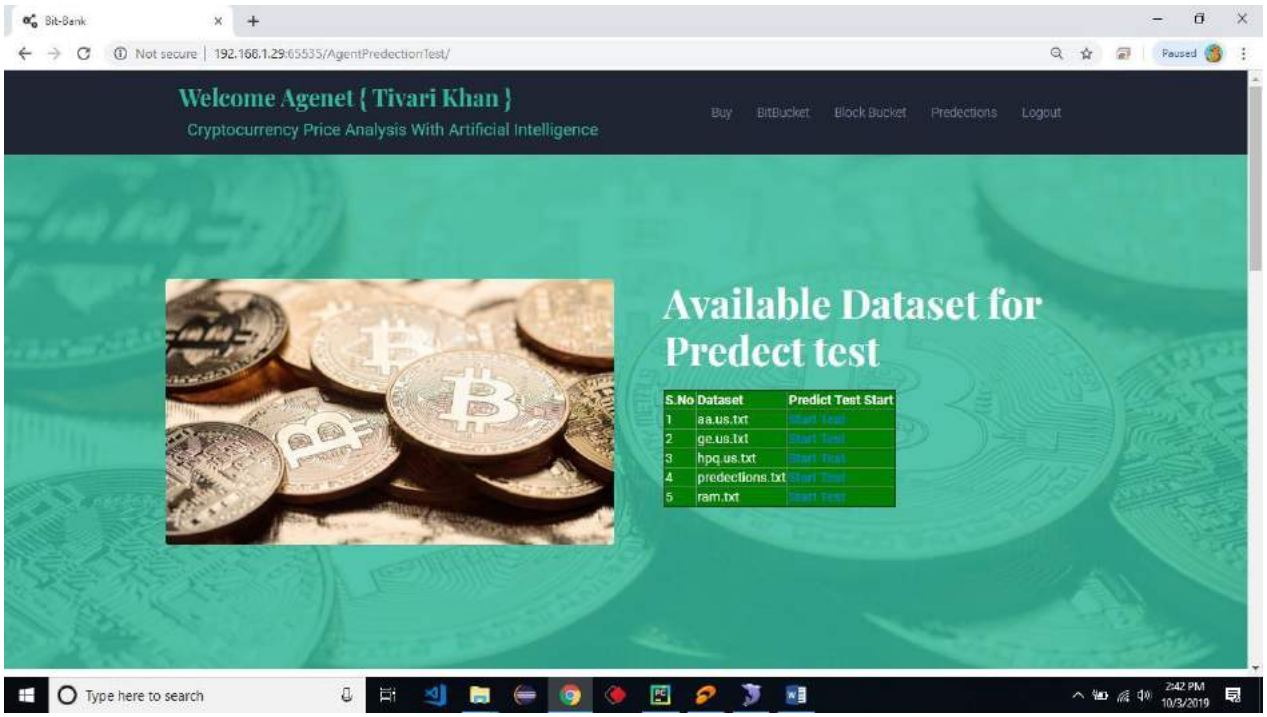


FIG 9.16 AGENT VIEW PREDICTIONS DATASET FOR TEST

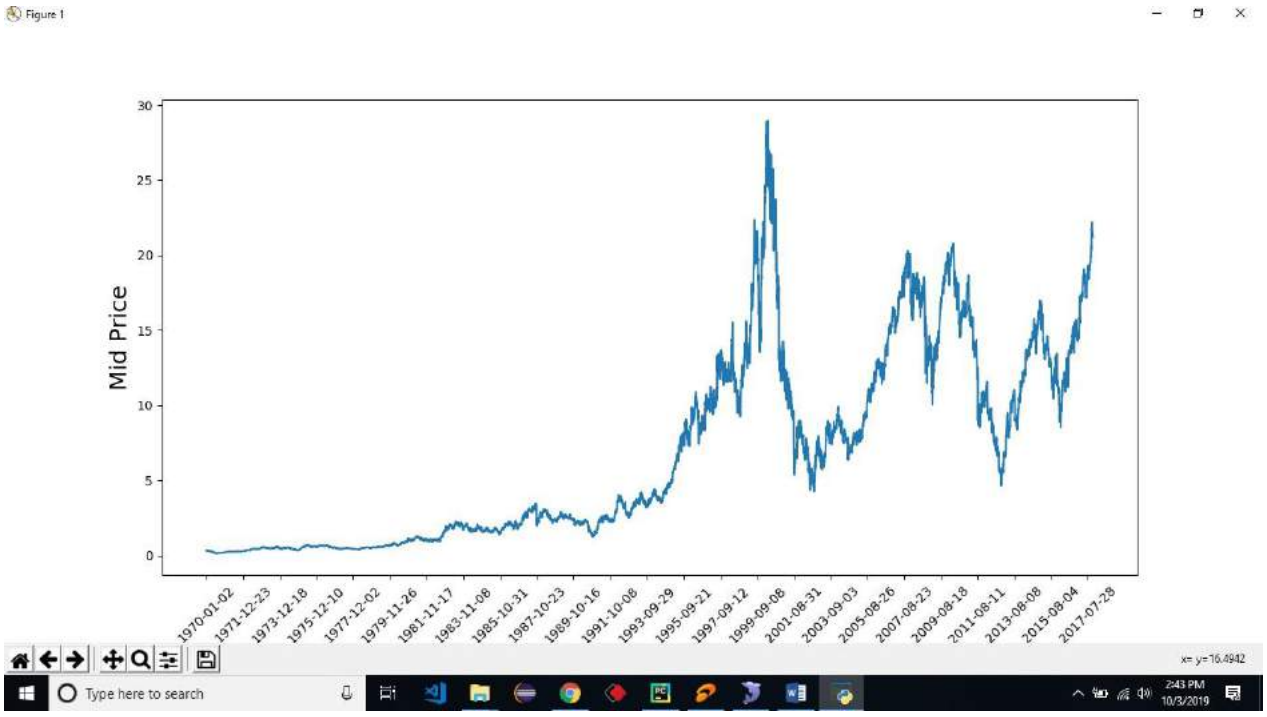


FIG 9.17 DATASET ANALYSIS

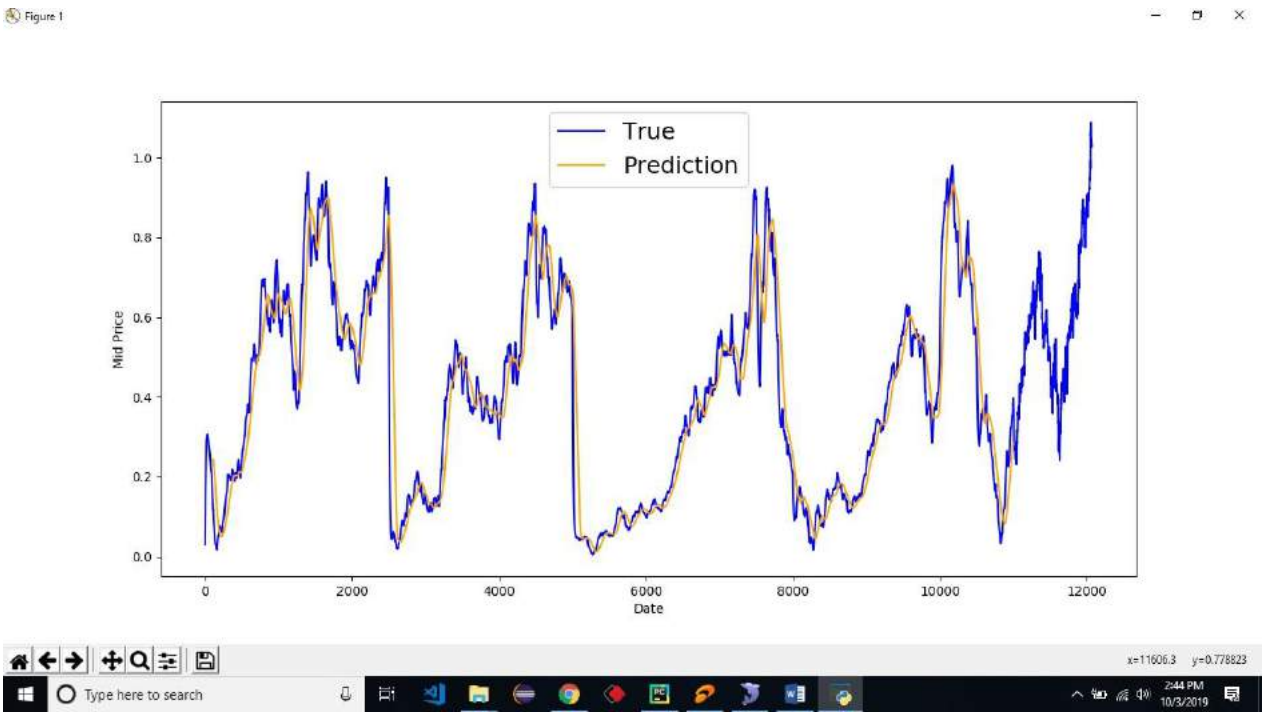


FIG 9.18 TRUE PREDECTIONS

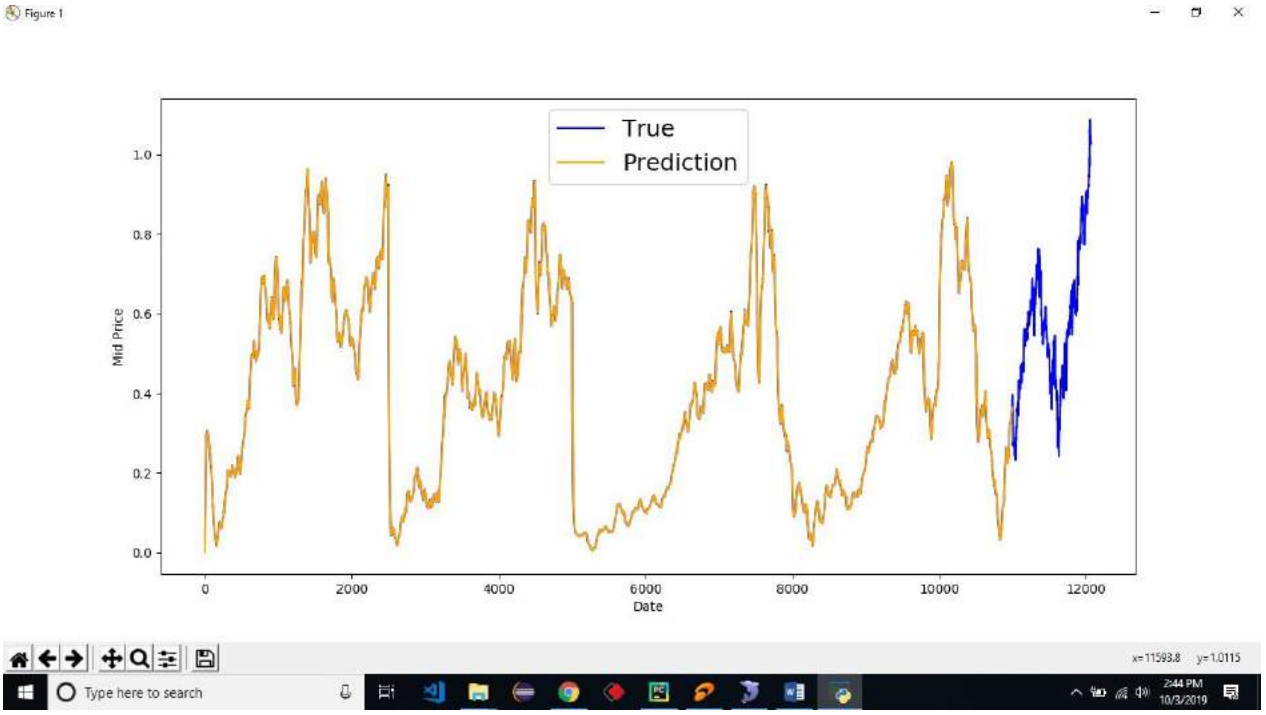


FIG 9.19 PREDICTIONS

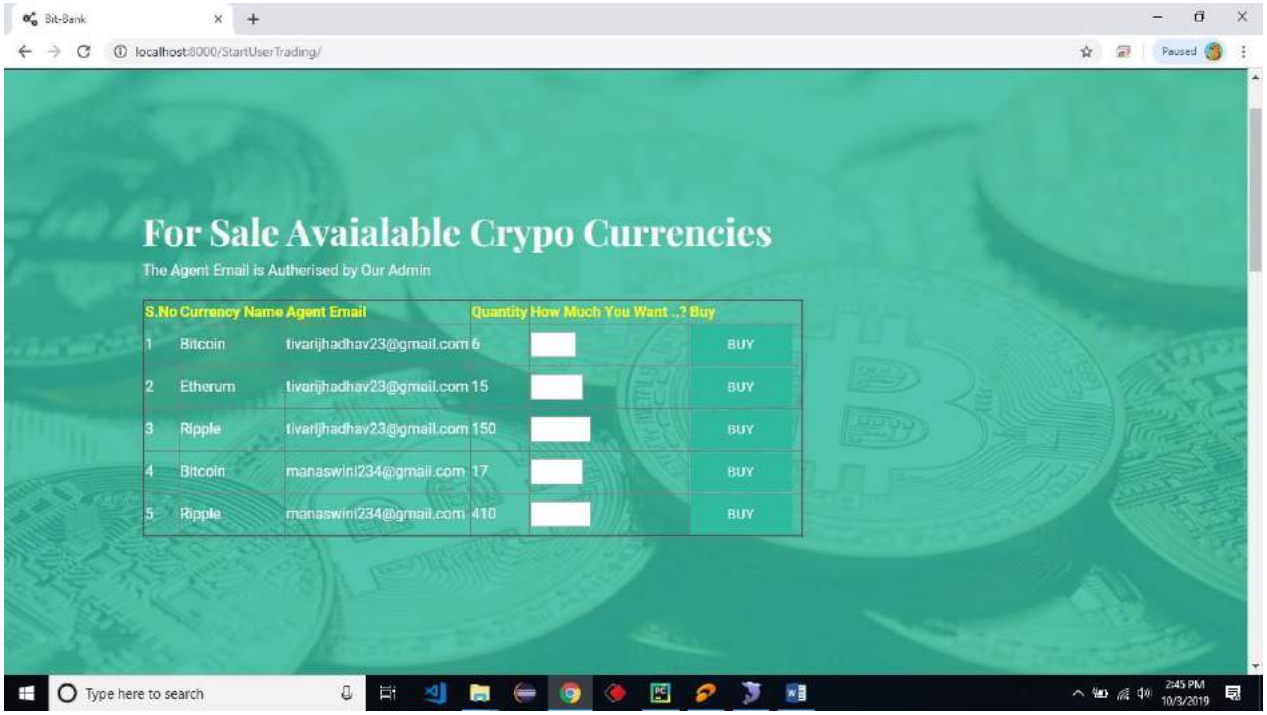


FIG 9.20 USER BUYING COINS

10.CONCLUSION

Cryptocurrency, such as Bitcoin, has established itself as the leading role of decentralization. There are a large number of cryptocurrencies sprang up after Bitcoin such as Ethereum and Ripple. Because of the significant uncertainty in its prices, many people hold them as a means of speculation. Therefore, it is critically important to understand the internal features and predictability of those cryptocurrencies. In this study, we use two distinct artificial intelligence frameworks, namely, fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM) to analyse and predict the price dynamics of Bitcoin, Ethereum, and Ripple. We showed that the ANN and LSTM models are comparable and both reasonably well enough in price prediction, although the internal structures are different. Then we further analyse the influence of historical memory on model prediction. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical

memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This study provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model.

11.FUTURE WORK

Unisoft dedicated team was incharge of developing a cryptocurrency price prediction slolution based on LSTM Models and setimental analysis of crypto forums and channels.The model provides the prediction of four types of price; ‘open’ , ‘High’, ‘Low’, ‘Close’ for every cryptocurrency individually.

The process of price prediction model is recomputed constantly by AI engine ,potentially in a constant update loop.The model works in real time.

The model accepts any number of input parameters(the network architecture allows you to add many technical market charateristics of a selected cryptocurrency), and gives a forecast at specified prices(‘Open’, ‘High’, ‘Low’,’Close’) at the output.

At present the model works with a timestep of one day and makes forecast for 7 days ahead;the architecture also provides a simple way to add new parameters to the line of the forecast in the future

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GITHUB: https://github.com/Manasa0318/project1

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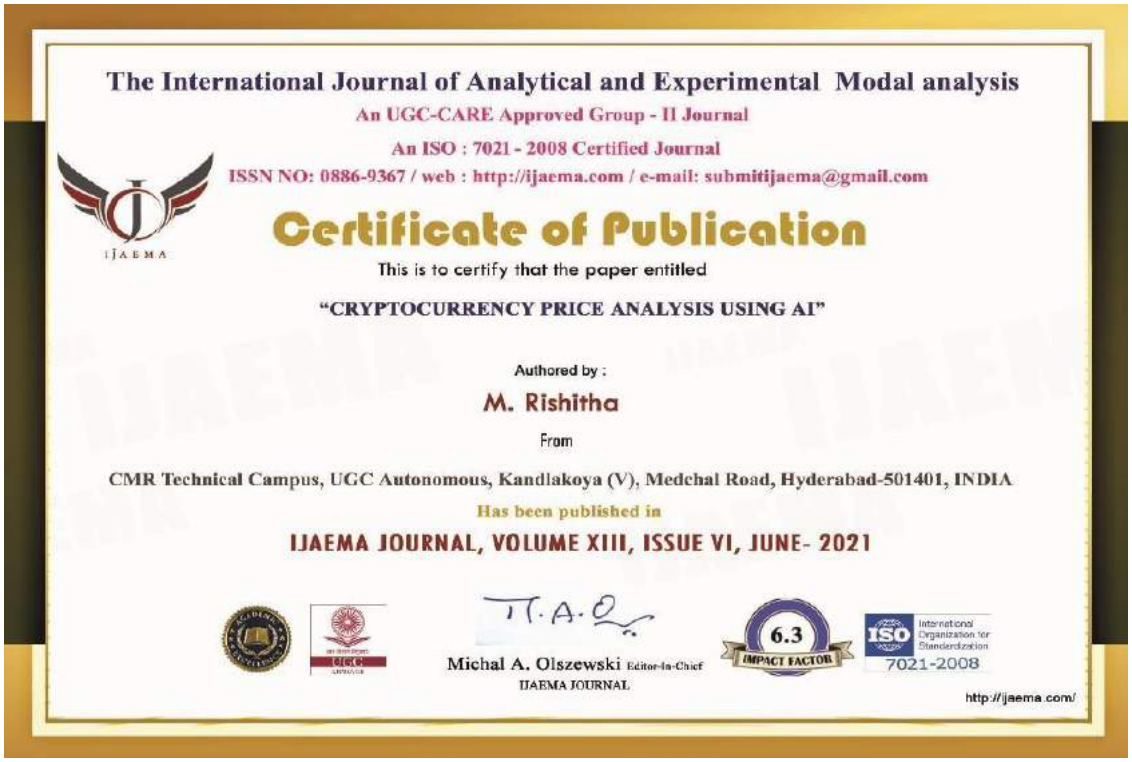

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Abstract:

Cryptocurrency is playing an increasingly important role in reshaping the financial system due to its growing popular appeal and merchant acceptance. While many people are making investments in Cryptocurrency, the dynamical features, uncertainty, the predictability of Cryptocurrency are still mostly unknown, which dramatically risk the investments. It is a matter to try to understand the factors that influence the value formation. In this study, we use advanced 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, Ethereum, and Ripple. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This study provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model. In this paper, two AI modelling frameworks are used to understand and predict the most popular cryptocurrencies price dynamics, including Bitcoin, Ethereum and Ripple.

Keywords*: Artificial Neural Network(ANN),Long Short Term Memory(LSTM),Bitcoin,Etherium,Ripple..*

I Introduction

Cryptocurrency is the peer-to-peer digital money and payment system that exist online via a controlled algorithm. When a miner cracks an algorithm to record a block of transactions to public ledger named block-chain and the cryptocurrency is created when the block is added to the block-chain. 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 capitalization 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 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 cryptographic proof rather 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. 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 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.

II. LITERATURE SURVEY

USING THE BITCOIN TRANSACTION GRAPH TO PREDICT THE PRICE OF BITCOIN: Bitcoin is the world's leading cryptocurrency, allowing users to make transactions securely and anonymously over the Internet. In recent years, The Bitcoin the ecosystem has gained the attention of consumers, businesses, investors and speculators alike. While there has been significant research done to analyze the network topology of the Bitcoin network, limited research has been performed to analyze the network's influence on 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 chockablock-networkbased feature engineering and machine learning optimization, we obtain up-down Bitcoin price movement classification accuracy of roughly 55%.

CRYPTOCURRENC VALUE FORMATION: AN EMPIRICAL

ANALYSIS LEADING TO A COST OF PRODUCTION MODEL FOR VALUING BITCOIN: 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 break even 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.

III. PROPOSED METHODOLOGY

Neural Network (RNN) model using Long Short-Term Memory (LSTM) regression algorithm on the acquired Cryptocurrency dataset for predicting the prices of cryptocurrency (Bitcoin) by analyzing the dataset and applying deep learning algorithms. Thus, for this research the dataset used consists of various parameters of Bitcoins data values . The goal of this research is to design a model that will consistently be able to predict the price of Bitcoin. Predicting the exact price is very hard. Therefore, we simplify the problem; we only try to predict whether the price will increase, decrease or stay the same within certain thresholds. The prediction analysis would be carried out based on the resultant values from the given algorithms. The objectives of proposed model is to create model that leads to the Bitcoin price prediction accuracy by incorporating RNN elements.

The brief description of various sections provides an insight that integrates the flow of this work. The second section represents various related works under this domain. The third section provides a generalized methodology used in this work. The fourth section gives an understanding of the proposed methodology which we have undertaken to accomplish our objectives. The results and observations constitute of the fifth section. The sixth section conforms the conclusions and future scope. The seventh and the final section enlists all the references used to assimilate our theories.

Various data scientists and researchers have worked to find out the prediction of the price of cryptocurrency by the means of different algorithms and approaches. The work proposed in [4] makes use of Bayesian Neural Networks (BNNs) by analyzing the time series of Bitcoin process which describes fluctuation in a timeseries format. The authors suggest the use of different machine learning algorithms to improve variability which the authors fails to sustain. The work presented in [7] aims

to analyses a timeseries data of bitcoin prices by using various variables. The authors suggest the scope that the time series data can be modeled by predicating price of the bitcoins using LSTM algorithm. It gives an insight about the backend processing of bitcoins followed by the use of a rolling window LSTM and empirical study for price prediction. The research work exhibited in [11] makes use of Multivariate Linear Regression to predict highest and lowest price of cryptocurrencies by using features like open, low and close. According to the authors of [11], this work fails to provide enough information for long term analysis. Therefore, the authors of this work propose a cope of using LSTM to analyze various cryptocurrencies.

Data Visualization of Bitcoin dataset. An RNN is actually an ANN prepared with historical but temporal memory, as it takes a sequence as input. For deep learning models, parameters are chosen with the help of some options available such as heuristic search model like genetic method and grid search, data pre- process stage is carried out to train the data and reshape into three dimensional arrays. Lastly, after reshaping the data it is finally fed to the LSTM regression model. This model consists of 2 hidden layers that Recurrent Neural Networks have chains of repetitive iterating modules of neural network. In standard RNNs, these modules are a simple connection of network layers. LSTMs have the cell state, and different gates. The cell is used to transfer information throughout the sequence also known as memory of the network This information is remembered by the memory in long term dependencies. So even information from the earlier can be used later thus eliminating the use of short-term memory. The resultant was used to predict the training and testing score and root mean square error. Thus, graph for the same was plotted. For ease of user manifestation, a GUI file picker was created.

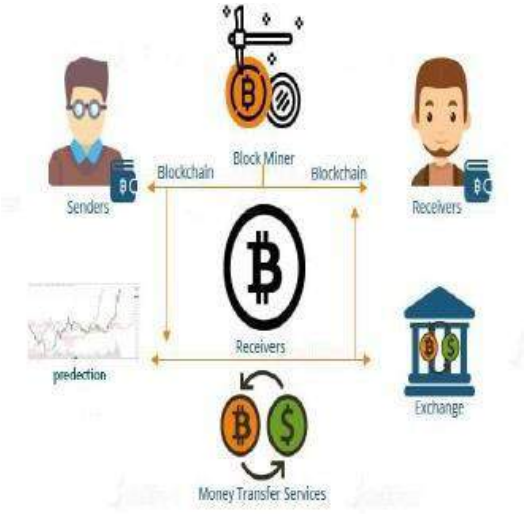

Fig 1: Project Architecture

In this system we have three modules User, Admin and Agent. Users role is to buy cryptocurrency from Agent. User can see the predictions and can but the cryptocurrency . Agent role is to transfer the cryptocurrency to User. And Admin role is to activate both User, Agent and Update.

IV RESULT ANALYSIS

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should

Identify the specific output that is needed to meet the requirements.

2.Select methods for presenting information.

3.Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

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..

FIG 2 MAIN HOMEPAGE

Figure 3 Login Page

Figure 4 Agent Login Page

Figure 5 Admin Active users

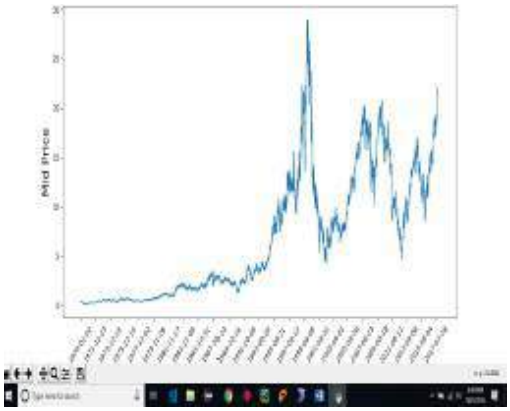

Figure 6 Price Analysis

V CONCLUSION

Cryptocurrency, such as Bitcoin, has established itself as the leading role of decentralization. There are a large number of cryptocurrencies sprang up after Bitcoin such as Ethereum and Ripple. Because of the significant uncertainty in its prices, many people hold them as a means of speculation. Therefore, it is critically important to understand the internal features and predictability of those cryptocurrencies. In this study, we use two distinct artificial intelligence frameworks, namely, fully-connected Artificial Neural Network (ANN) and Long-Short-Term-Memory (LSTM) to analyse and predict the price dynamics of Bitcoin, Ethereum, and Ripple. We showed that the ANN and LSTM models are comparable and both reasonably well enough in price prediction, although the internal structures are different. Then we further analyse the influence of historical memory on model prediction. We find that ANN tends to rely more on long-term history while LSTM tends to rely more on short-term dynamics, which indicate the efficiency of LSTM to utilize useful information hidden in historical memory is stronger than ANN. However, given enough historical information ANN can achieve a similar accuracy, compared with LSTM. This study provides a unique demonstration that Cryptocurrency market price is predictable. However, the explanation of the predictability could vary depending on the nature of the involved machine-learning model.

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