A

PROJECT REPORT

ON

Cryptocurrency Price Prediction

Submitted by

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For Partial Fulfillment of the Requirements for Bachelor of Technology in Information Technology

Guided by

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CERTIFICATE

This is to certify that the project work entitled **Crypto Price Prediction** has been successfully carried out by **(Smit Ghelani(18IT401), Parth Panchani(18IT410), Jigar Shekhat(18IT427) and Anuj Gajjar(19IT602)** for the subject **Project I (4IT31)** during the academic year 2021-22, Semester-I for partial fulfilment of Bachelor of Technology in Information Technology. The work carried out during the semester is satisfactory.

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ABSTRACT

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The purpose of major project is to work on live project which help the people in real world and get hands on experience. Working on this kind of project helps to gain knowledge and useful to improve domain expertise. We are working on Crypto-currencies Price Prediction. Purpose of this system is to simplify collection of past data of crypto-currencies and making easy prediction of future crypto prices for our customers. They can predict future price by two best algorithms for prediction – LSTM-RNN and Random Forest.

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CHAPTER 1: INTRODUCTION

1.1 Brief overview of the work

Crypto currency market is newly immerging market for investment and maybe cryptocurrency could be the transaction currency in nearby future. But it is now similar to the stock market for investment and it is not accurately predictable. So, we are going to do analysis of the behavior of cryptocurrencies and as a part of analysis we will do predictive analysis using machine learning algorithms. We try to compare best two algorithms for the analysis that we have found from various research and reviews and find accuracy for the same.

1.2 Objective

Main objective of this is to analyze the behavior of cryptocurrency market and find out the best predictive algorithm among various available algorithms. This will help us in this field for future and also it will help many people working in this direction.

1.3 Scope

Scope of this include major cryptocurrency market investors and maybe in future could include all the people in this world. Prediction of crypto currencies' price using machine learning will be useful for all investors as well as data analysts to invest or work in this field. Demand and Supply of crypto is a major reason of price change.

1.4 Project Modules

1.4.1 Login / Signup:

This module is basic module for every kind of system. It provides the user authentication and also provide privacy to user. Also this is the basic way to restrict user activities.

1.4.2   Crypto price predictions:

This module is our main module in this module we are going to do actual price predictions of cryptocurrencies. Also this module is the core of this project and this module through all the user will get their desired output by selection coins for which they want predictions.

1.4.3   Data visualizations:

This module is used to show our prediction results to user. This module is basically the sub module of above module and this module provide attractive output results. So that user will get their desired out and understand easily by looking graphical representation of results.

1.4.4   UI design and Admin Functionalities:

This module is basically for user facilities provide support of various features related to user activities on web app like easily finding currency related news, read about us page, UI Design, user and admin profiles, their activities also other task related work included in this module.

1.5 Project Hardware/Software Requirements

- OS – Window 7 or above
- Text editor – VS code
- Any Browser
- Python Modules
  - NumPy
  - Pandas
  - Sk-learn
  - Matplotlib
  - Seaborn
- Front-end – HTML/CSS
- Back-end – Django (Python)

CHAPTER 2: LITERATURE REVIEW

Depending on the statistical accuracy of the Bitcoin and Other major currency prices where the array of datasets is taken first. Then preprocessing is completed and the function is extracted from it.

We found from various research papers and reviews from internet that most preferably LSTM RNN/RNN and Random Forest algorithms is best and most accurate algorithms to analyze the crypto currency market as well as stock market.

With the neural network a clear idea of the result of the graph is obtained to them. Mostly they have done the prediction of bitcoin prices. it is very highly predicted by the LSTM Recurrent Neural Network (RNN) and that Random Forest algorithm predicts Bitcoin prices quite closely but less than LSTM RNN, but LSTM RNN is very effective if the dataset is really high and with a large number of volumes, days and hour. If some more information can be added making the database more complex LSTM RNN can function properly giving the best prediction over time.

This work will be our first to study of crypto market by means of an algorithm-based architecture model including more realistic prediction strategies. In future research models investigation based on application of more advanced and complex model and datasets will be done paving the way to predict the Bitcoin and other cryptocurrencies prices very easily so that cryptocurrencies could be the safe investment region for many people around the globe.

CHAPTER 3: SYSTEM ANALYSIS & DESIGN

3.1 Comparison of Existing Applications with Project with merits & demerits

3.1.1 TradingView:

Pros:

- Cloud based Charting
- Sharing Servers for System Sharing
- Active Community

Cons:

- Price: $12.95 per month
- Programing Knowledge Required
- Interface
- No User-Friendly UI

3.1.2 Shrimpy:

Pros :

- Market Timing Signals
- Specific Buy & Sell Signals
- Simple to Follow System

Cons:

- Price: $19 per month
- Expensive, Especially with Add-ons
- Provides Signals with No Proven Track Record
- Limited Number of Chart Indicators
- No Easy to use

3.1.3   Coinigy:

Pros:

- Automated Trendline & Fibonacci Detection
- Real-time Data Included
- Automatic Multi-Timeframe Analysis

Cons:

- Price: $18.66 per month
- No Auto Trading (Yet)
- No Social
- Complex UI

3.2 Project Feasibility Study

Crypto-currencies market cannot be accurately predicted. The future, like any complex problem, has far too many variables to be predicted. The Crypto-currencies market is a place where buyers and sellers converge. When there are more buyers than sellers, the price increases. When there are more sellers than buyers, the price decreases. So, there is a factor which causes people to buy and sell. It has more to do with emotion than logic. Because emotion is unpredictable, Crypto-currencies market movements will be unpredictable. It's futile to try to predict where markets are going. They are designed to be unpredictable.

The proposed system will not always produce accurate results since it does not account for the human behaviors. Factors like change in company's leadership, internal matters, strikes, protests, natural disasters, and change in the authority cannot be taken into account for relating it to the change in Crypto-currencies market by the machine.

The objective of the system is to give an approximate idea of where the Crypto-currencies market might be headed. It does not give a long-term forecasting of a Crypto-currencies price value. There are way too many reasons to acknowledge for the long-term output of a current Crypto-currencies. Many things and parameters may affect it on the way due to which long term prediction is just not feasible.

3.2.1 Operational Feasibility:

Operational feasibility is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. Operational feasibility reviews the willingness of the organization to support the proposed system. This is probably the most difficult of the feasibilities to gauge. In order to determine this feasibility, it is important to understand the management commitment to the proposed project. If the request was initiated by management, it is likely that there is management support and the system will be accepted and used. However, it is also important that the employee base will be accepting of the change. The operational feasibility is the one that will be used effectively after it has been developed. If users have difficulty with a new system, it will not produce the expected benefits. It measures the viability of a system in terms of the **PIECES** framework. The **PIECES** framework can help in identifying operational problems to be solved, and their urgency:

1. **Performance:** Does current mode of operation provide adequate throughput and response time?

   As compared to traditional methods of manually retrieving the Crypto-currencies data from the web and forecasting the Crypto-currencies prices with large number of manual calculations, this system plays a very important role in designing an application that automates the process of data retrieval and Crypto-currencies movement/price prediction with the help of a user-friendly dashboard, thus making the process easier and faster.

2. **Information:** Does current mode provide end users and managers with timely, pertinent, accurate and usefully formatted information?

   System provides end users with timely, pertinent, accurate and usefully formatted information. Since all the Crypto-currencies related information is

being pulled from Yahoo Finance against a unique Crypto-currencies Symbol, it will provide for meaningful and accurate data to the investor. The investing decisions are made by the traditional investors manually. This results in loss of validity of data due to human error. The information handling and the investing decision in the proposed system will be driven by computerized and automatically updated prediction and validation of Crypto-currencies data. The human errors will be minimal. The data will be automatically updated from time to time and will be validated before the data is processed into the system.

3. **Economy:** Does current mode of operation provide cost-effective information services to the business? Could there be a reduction in costs and/or an increase in benefits?

   Determines whether the system offers adequate service level and capacity to reduce the cost of the business or increase the profit of the business. The deployment of the proposed system, manual work will be reduced and will be replaced by an IT savvy approach. Moreover, it has also been shown in the economic feasibility report that the recommended solution is definitely going to benefit economically in the long run. The system is built on Excel, R and JavaScript. Excel and Javascript do not need any additional installation; they are in-built in every system. R needs installation but it is free software. So, overall, the application is very economically feasible.

4. **Control:** Does current mode of operation offer effective controls to protect against fraud and to guarantee accuracy and security of data and information?
   As all the data is pulled from Yahoo Finance, which is a public Crypto-currencies data provider, it does not contain any confidential information which can be misused, so on that contrast there should be no use of any security corner for this system.

5. **Efficiency:** Does current mode of operation makes maximum use of available resources, including people, time, and flow of forms?
   Efficiency work is to ensure a proper workflow structure to store patient data;

we can ensure the proper utilization of all the resources. It determines whether the system makes maximum use of available resources including time, people, flow of forms, minimum processing delay. In the current system a lot of time is wasted as the investing decisions are made by the traditional investors manually. The proposed system will be a lot efficient as it will be driven by computerized and automatically updated prediction and validation of Crypto-currencies data. The data will be automatically updated from time to time and will be validated before the data is processed into the system.

6. **Services:** Does current mode of operation provide reliable service? Is it flexible and expandable?

The system is desirable and reliable services to those who need it and also whether the system is flexible and expandable or not. The proposed system is very much flexible for better efficiency and performance of the organization. The scalability of the proposed system will be inexhaustible as the storage capacity of the system can be increased as per requirement. This will provide a strong base for expansion. The new system will provide a high level of flexibility.

3.2.2 Technical Feasibility:

A large part of determining resources has to do with assessing technical feasibility. It considers the technical requirements of the proposed project. The technical requirements are then compared to the technical capability of the organization. The systems project is considered technically feasible if the internal technical capability is sufficient to support the project requirements.

The developer must find out whether current technical resources can be upgraded or added to in a manner that fulfils the request under consideration. This is where the expertise of system analysts is beneficial, since using their own experience and their contact with vendors they will be able to answer the question of technical feasibility. The essential questions that help in testing the technical feasibility of a system include the following:

1. Is the project feasible within the limits of current technology?

2. Does the technology exist at all?

3. Is it available within given resource constraints?

4. Is it a practical proposition?

5. Manpower- programmers, testers & debuggers

6. Software and hardware

7. Are the current technical resources sufficient for the new system?

8. Can they be upgraded to provide to provide the level of technology necessary for the new system?

9. Do we possess the necessary technical expertise, and is the schedule reasonable?

10. Can the technology be easily applied to current problems?

11. Does the technology have the capacity to handle the solution?

12. Do we currently possess the necessary technology?

Automated Crypto-currencies Prediction system deals with the modern technology system that needs the well efficient technical system to run this project. All the resource constrains must be in the favor of the better influence of the system. Keeping all this fact in mind we had selected the favorable hardware and software utilities to make it more feasible.

3.3 Project Timeline chart
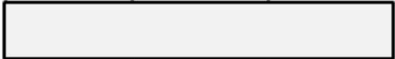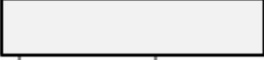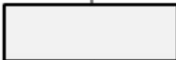
Development Phase	90 Days						Duration (Day)
	0 to 15 Day	16 to 30 Day	31 to 45 Day	46 to 60 Day	61 to 75 Day	76 to 90 Day	
Requirement Gathering	�						10
Analysis		▢					15
Design		▢▢▢▢					30
Coding				▢▢▢			25
Testing					▢▢		12
Implementation						▢	08
Documentation		▢▢▢▢▢▢▢▢▢▢▢▢					80
Total Time (Days)							90

figure 1: Timeline chart

3.4 Detailed Modules Description

3.4.1 Login / Signup:

- The first page that users will encounter will be the login page. All users will be required to either login to an existing account or sign up for a new one. This page will show a simple box with two input areas where the user can enter their user name and password. Underneath this input are two buttons next to each other. The left button will be the Login button and the button next to it is the Sign-up button.

➢ Clicking the Login button will either bring you to the home page if you entered the correct username and password or it will just refresh the login page with an error stating that you have entered your credentials wrong.

➢ On the login page, if a user is not already registered, they can sign up to create a new account by clicking on the Sign-up button. When clicked, this button will bring them to the registration page where they will be able to create a username and password. They will also be required to enter an email address and entering their name.

3.4.2 Crypto price predictions:

➢ Through this user can search crypto-currencies which are registered under yahoo finance. To get information about crypto-currencies, current trend of crypto-currency and predictions about crypto-currency, user has to search about the require crypto-currency by its name through the list menu. It is easy and convenient way to search about anything for user without fail.

➢ Back side of system UI there should be a mechanism which find the prediction price for user. This mechanism is algorithm which will work for user to give satisfactory output about cryptocurrency, so the output of algorithm guide user to invest in particular cryptocurrency. So, user can minimize the risk associated with cryptocurrency market trading.

3.4.3 Data visualizations:

➢ This section is where the graph of the cryptocurrency's historical and prediction data will be displayed. The graph will have an indicator of the current data and which points on the graph represent the cryptocurrency prediction. Underneath this section, will be a smaller section that will show the open, high, low, and current value of the cryptocurrency for that given hour or however long we decide to refresh the data.

3.4.4 UI design and Admin Functionalities:

➢ User interface should be easy to use and user friendly for any system. UI is main attraction of any system. In the project user interact with the system through UI. User interface through user can get desired result very quickly and easily by just one click. The purpose of this module is to provide the user interface and view functions for the system. This is the system with which the user directly interacts and get prediction data. This module is created to provide the user interface to the system.

➢ User can add favorite crypto-currency and manage it from homepage.

➢ Admin can add and remove crypto-currencies. Also, admin can allow customers permissions.
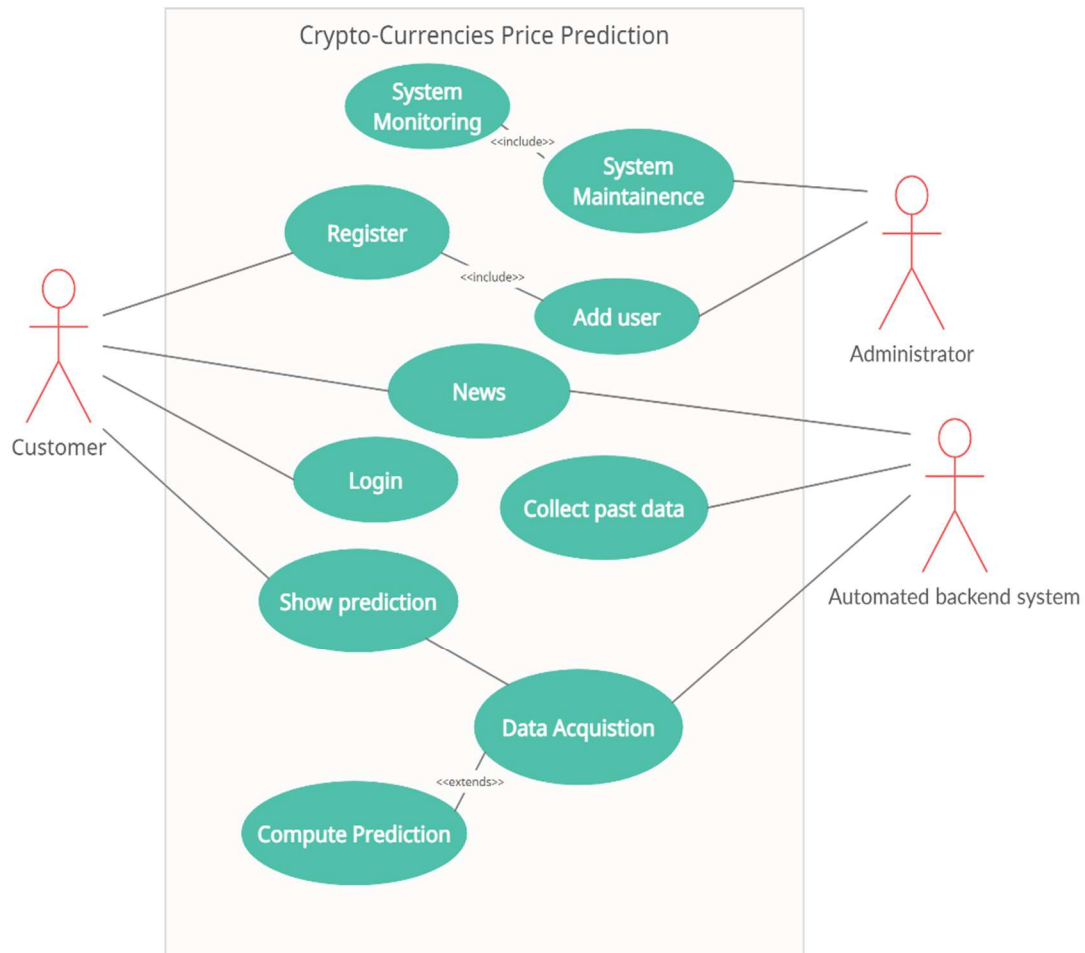
3.5 Project SRS

3.5.1 Use Case Diagrams

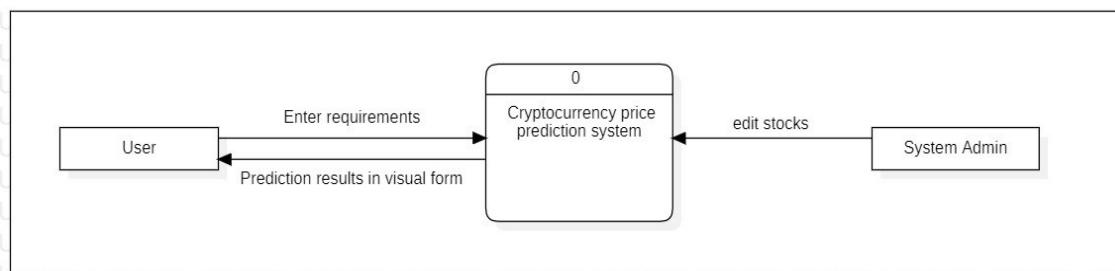figure 2: Use Case Diagram

3.5.2 Data Flow Diagrams

Level-0:
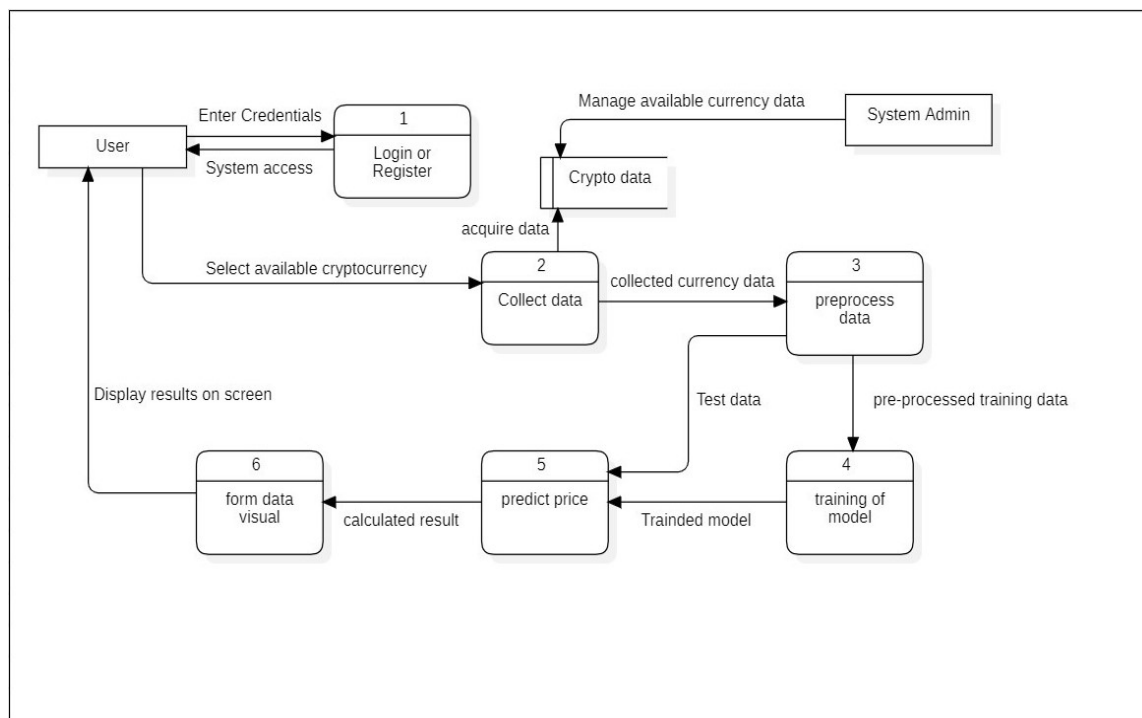

figure 3: Data Flow Diagram level-0

Level-1:

figure 4: Data Flow Diagram level-1
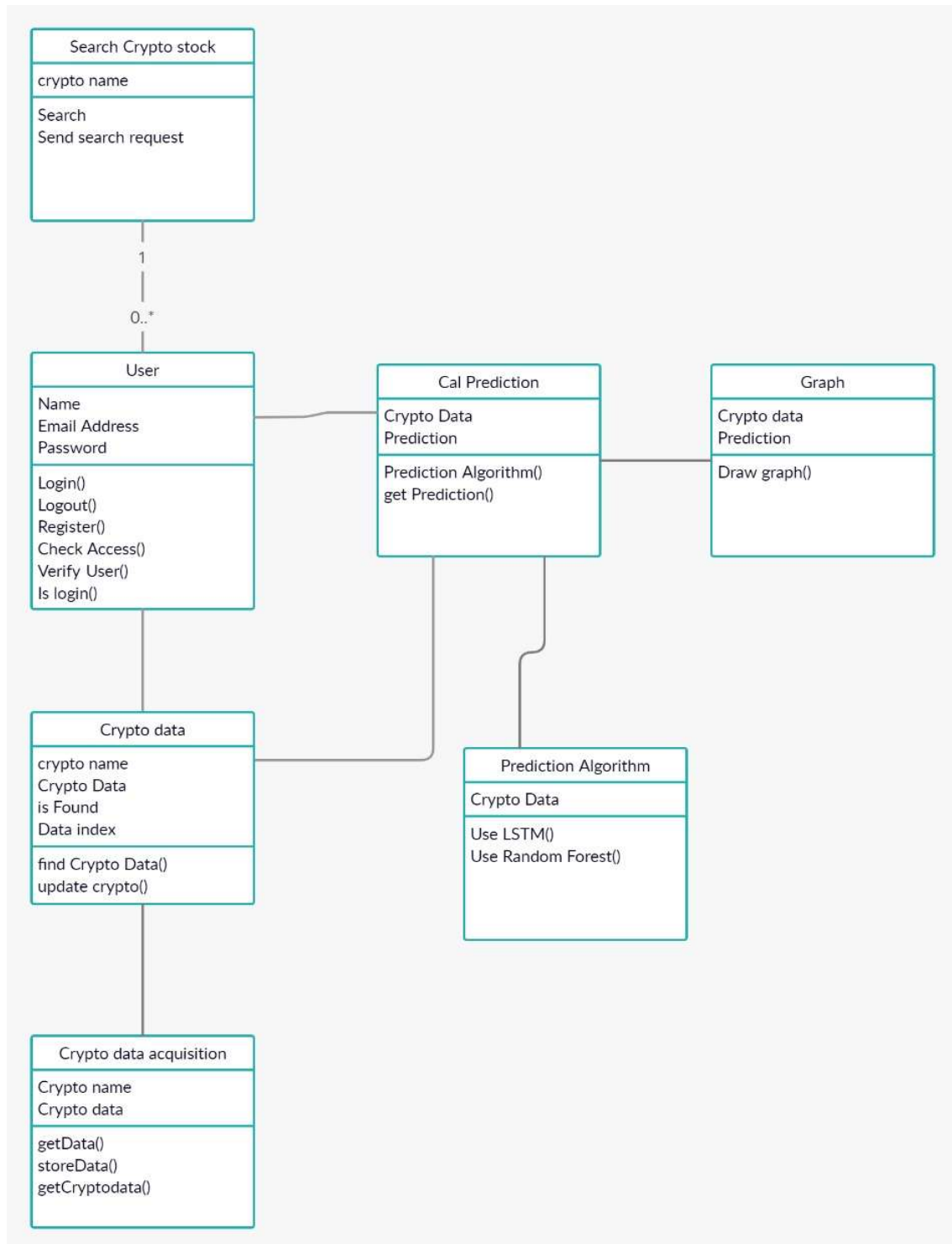
3.5.3 Class diagram

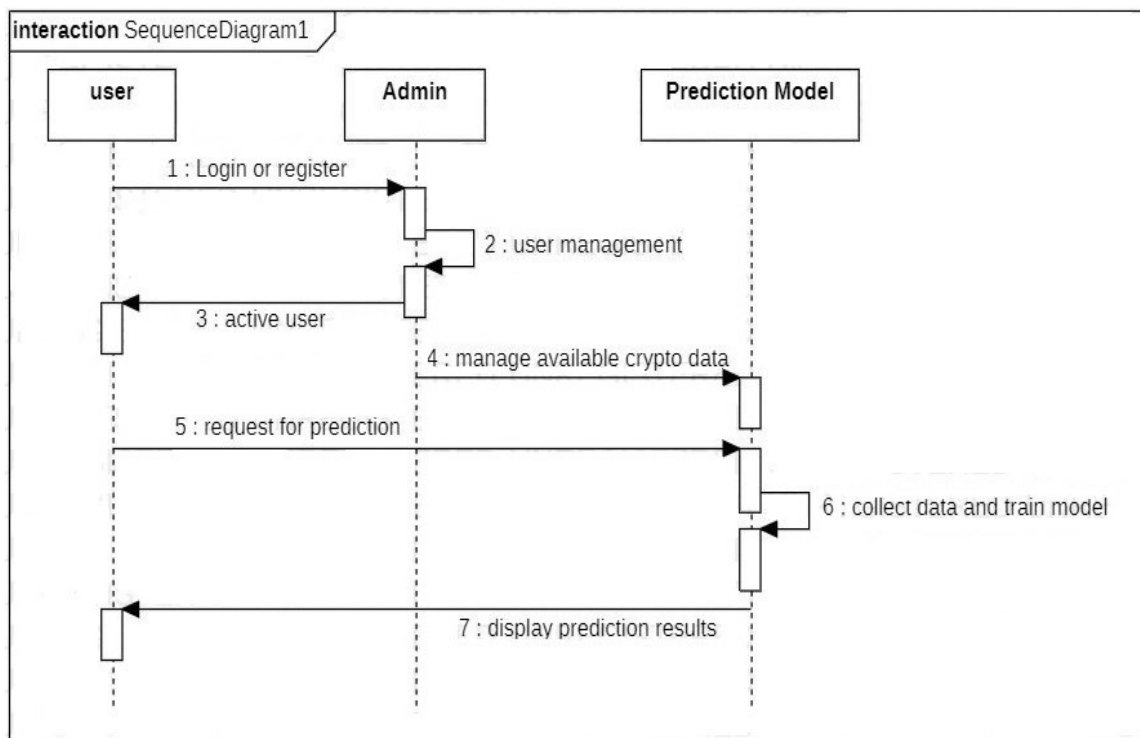figure 5: Class Diagram

3.5.4 Sequence Diagram

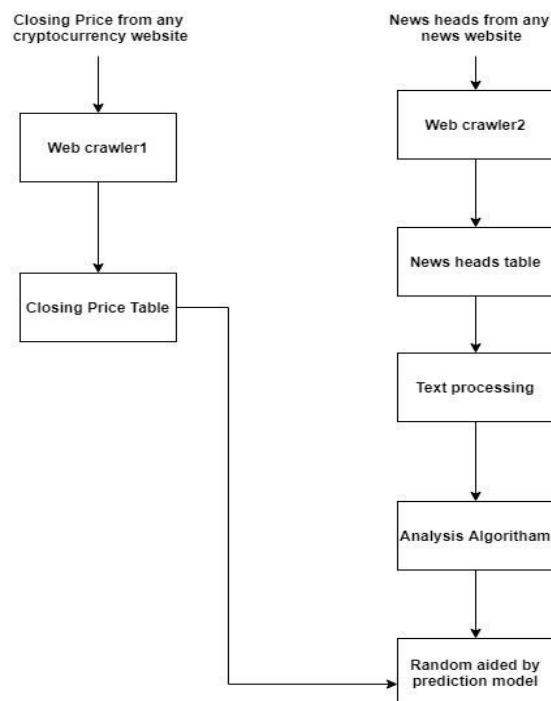
figure 6: Sequence Diagram

3.5.5 Activity Diagram

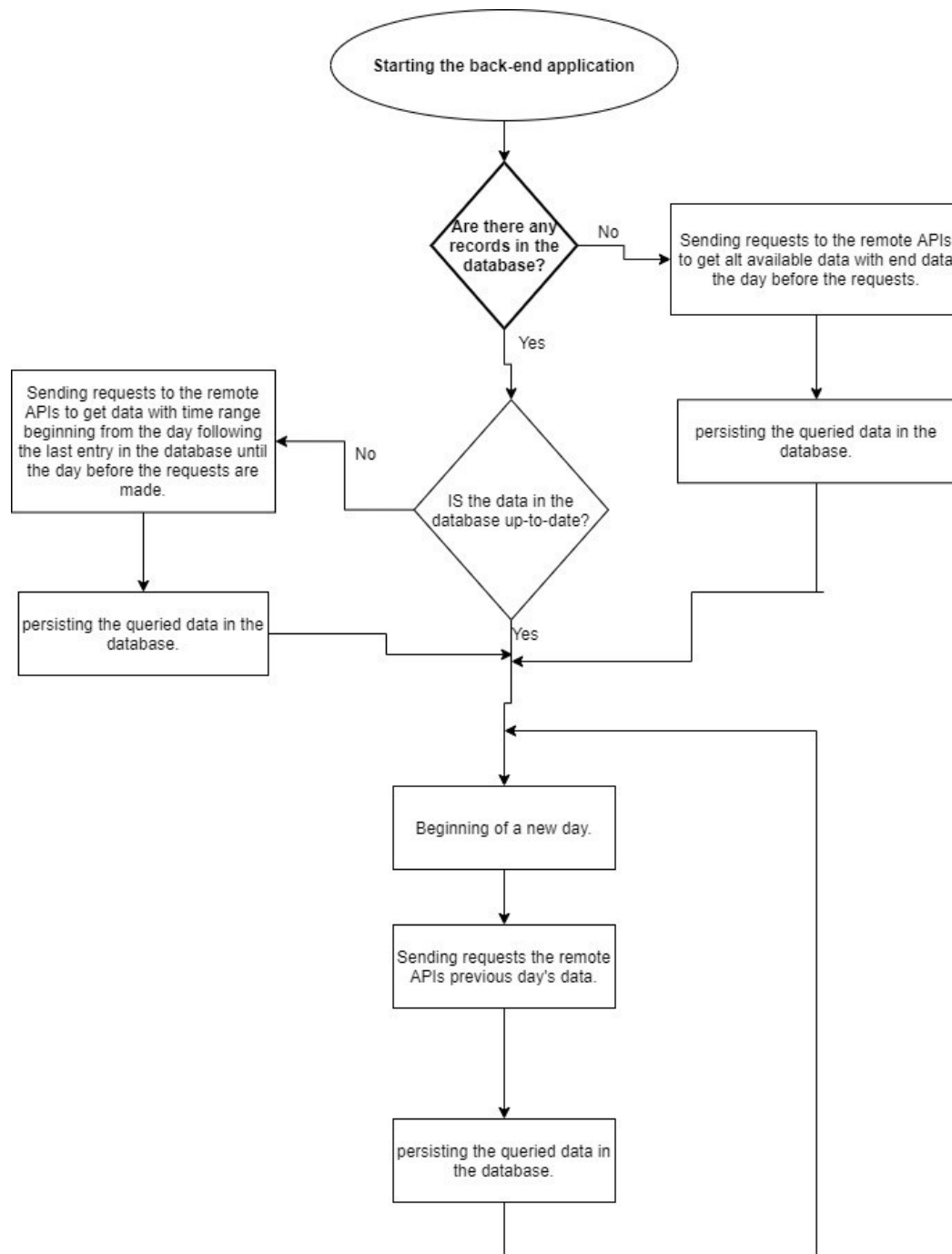figure 7: Activity Diagram

3.5.6 State Diagram

figure 8: State Diagram

3.6 Data Dictionary

Table Name: Cryptocurrency_data

Primary Key: Currency_Symbol

Description: To store data of Crypto currency

Sr. No.	Name	Datatype	Constraint	Description
1	Currency_Symbol	Varchar	Primary key	To store currency symbol
2	Date	Date	Not null	To store date
3	Open	Float	Not null	To store open price of crypto currency
4	High	Float	Not null	To store Highest price of currency
5	Low	Float	Not null	To store Lowest price of currency
6	Close	Float	Not null	To store close price
7	Adj. Close	Flost	Not null	To store adj. close value
8	Volume	Float	Not null	To store Volume of trades
9	Prediction	Float	-	To store trades

Table 1. Cryptocurrency_data

Table Name: Admin

Primary Key: Username

Foreign Key: Currency_symbol

Description: To store the admin Details

Sr. No.	Name	Datatype	Constraint	Description
1	Username	Varchar	Primary key	To store the user name
2	Currency_symbol	Varchar	Foreign Key	To store Cryptocurrency symbol
3	Password	Varchar	Not null	To store password

Table 2. Admin Details

Table Name: Prediction_model

Primary Key: Currency_Symbol

Description: To store predictions of cryptocurrencies

Sr. No.	Name	Datatype	Constraint	Description
1	Currency_Symbol	Varchar	Primary key	To store symbol of Cryptocurrency
2	Date	Date	Not null	To store date
3	Active_value	Float	Not null	To store active value
4	Predicted_value	Float	-	To store predicted value

Table 3. Prediction Data

CHAPTER 4: IMPLEMENTATION AND TESTING

4.1 User Interface and Snapshot

4.1.1 Login / Signup:

- **Description:** login forms are one of the most important elements that a web page contains and hence designing these online forms is one of the most significant features when it comes to designing the website.

- When user didn't login then login page restricts their activity and don't give permission to use other tabs.
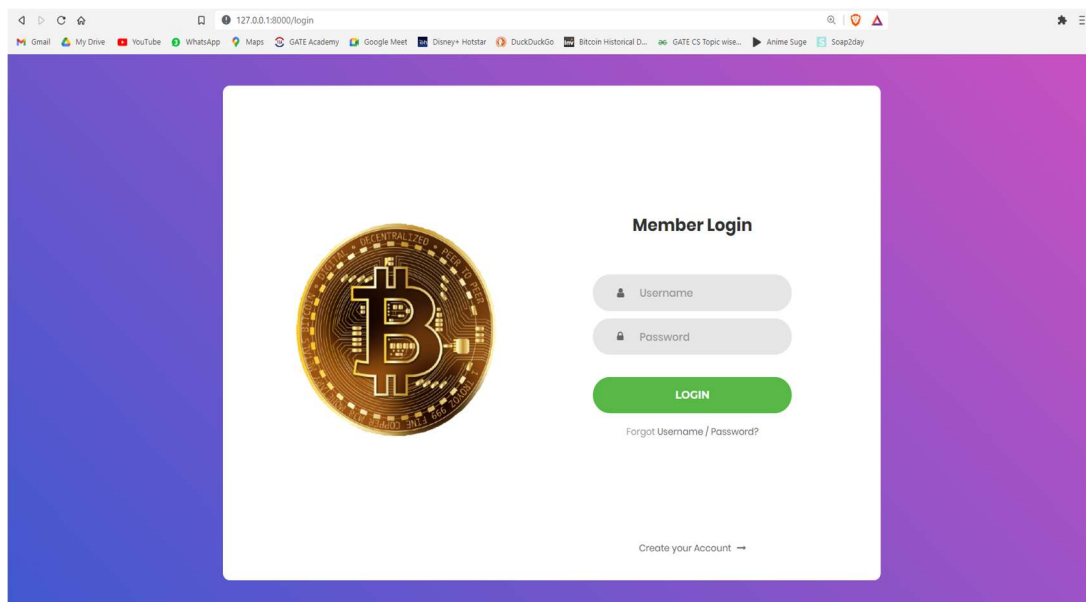
figure 9: Login Page

4.1.2 Crypto price predictions:

- **Description:** In this module, first of all, Project collect data from yfinance. then process the data and create LSTM RNN and Random forest model. And use that model to predict the data.
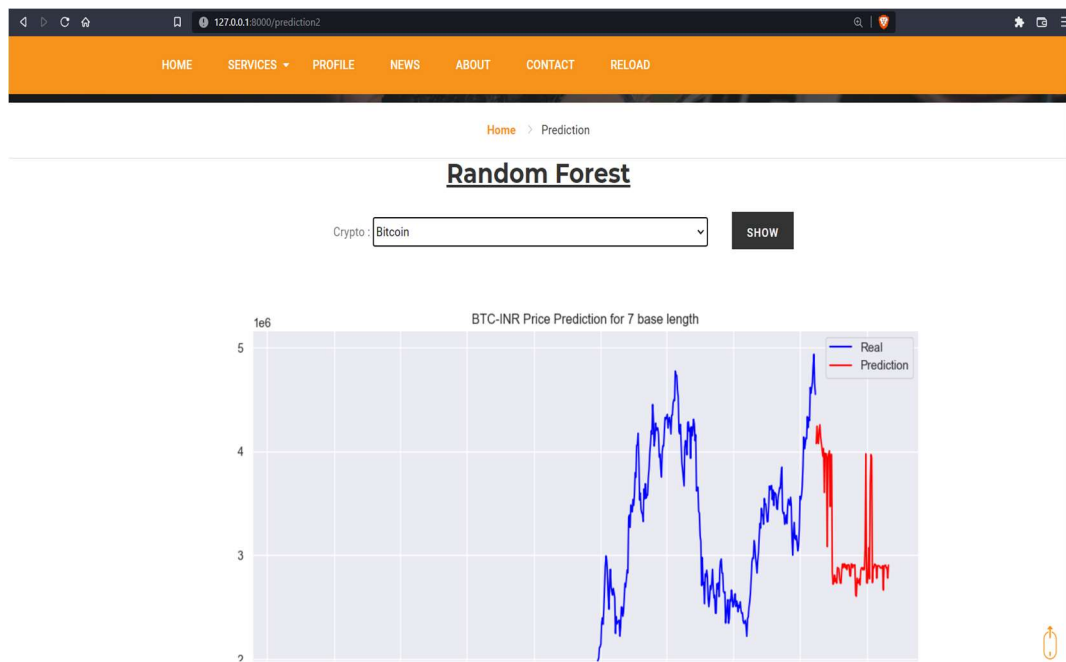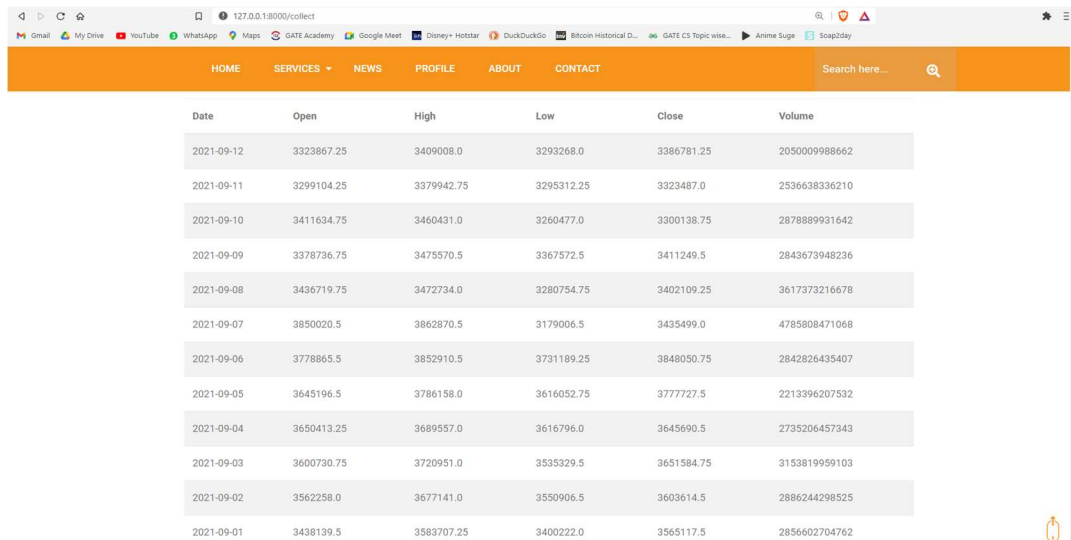
figure 10: Crypto price prediction

4.1.3   Data visualizations:

- **Description:** Data visualization module simply shows the result of predictions inform of graphical and tabular format. So user can understand easily.

figure 11: Data visualization

figure 12: Data Table

4.1.5 UI design:

- **Description:** This module is work in the direction to do simplify user experience in using this plate form and provide easy to use system.
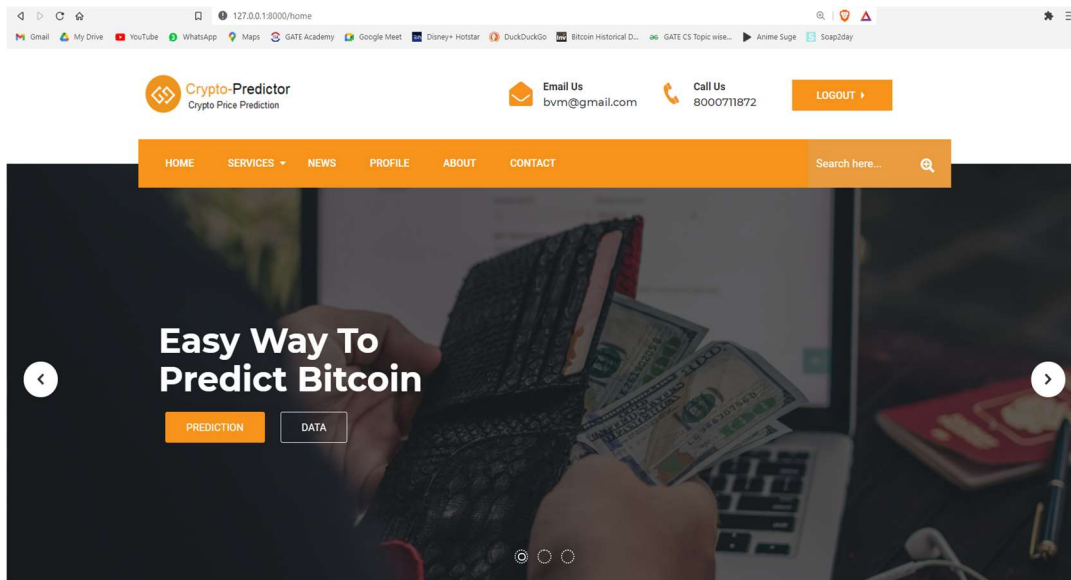

figure 13: Home Page

- **News:** This section provide live news related to crypto currency market.
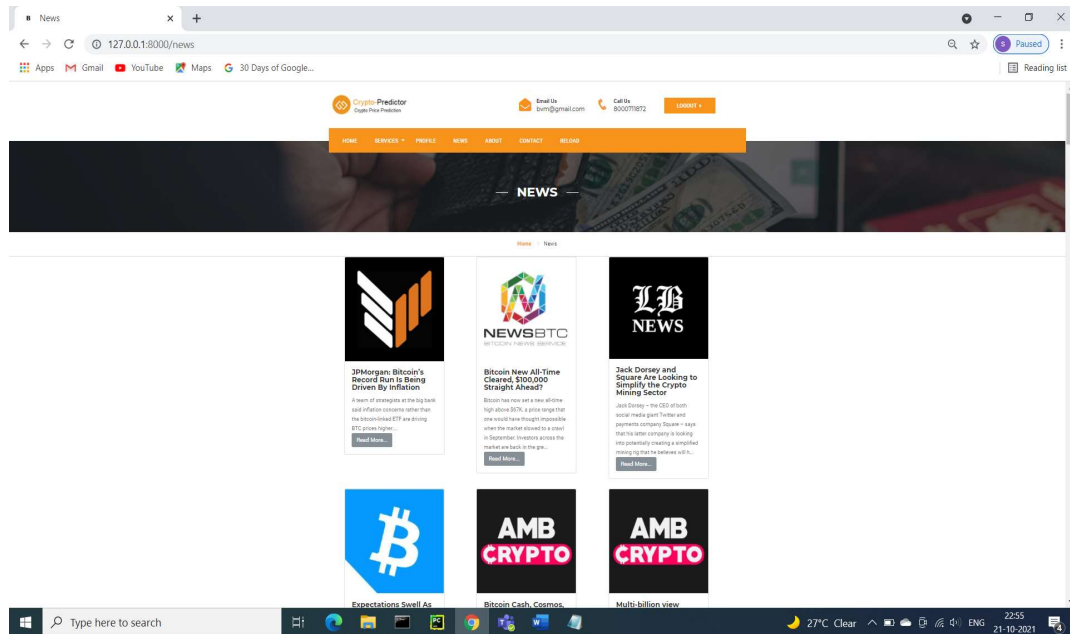
figure 14: News

- **Contact us:** This contact us page for send query related to user experience in this system.
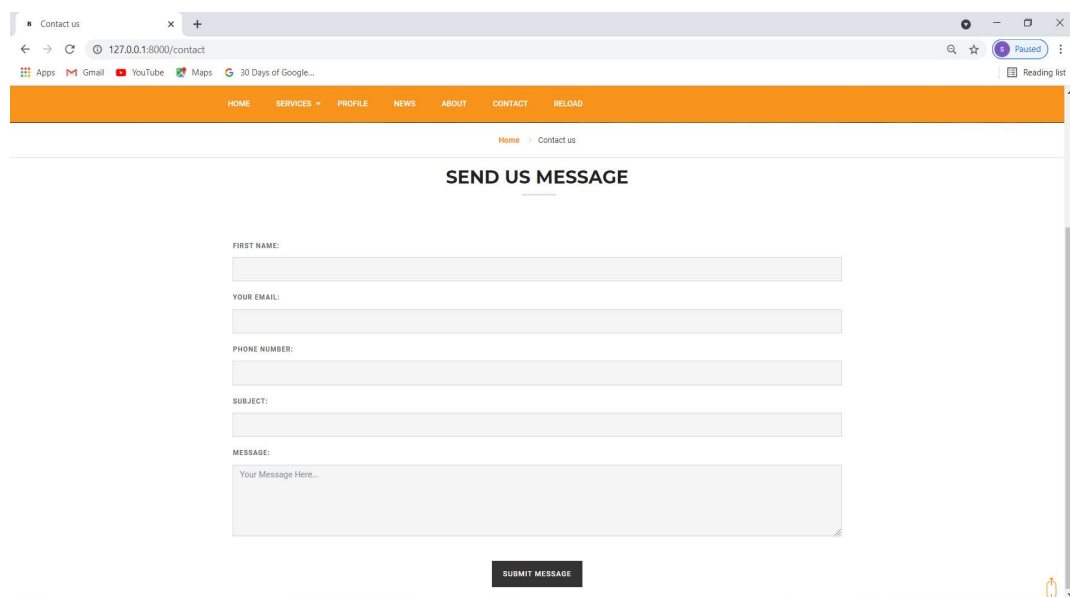

figure 15: Contact Us

> ➢ **Reload:** This is used to update price prediction model data and save the model to work smoothly.
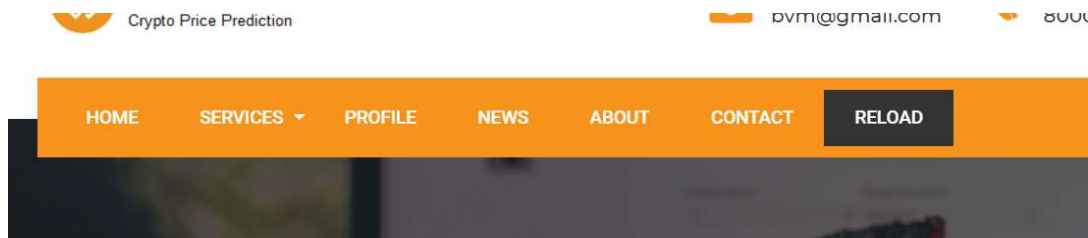

figure 16: Reload

4.2 Testing using Use Cases

4.2.1 Test case -1

In our Login page, User have to enter username and password in valid manner. Otherwise, it will give error that invalid username or password.
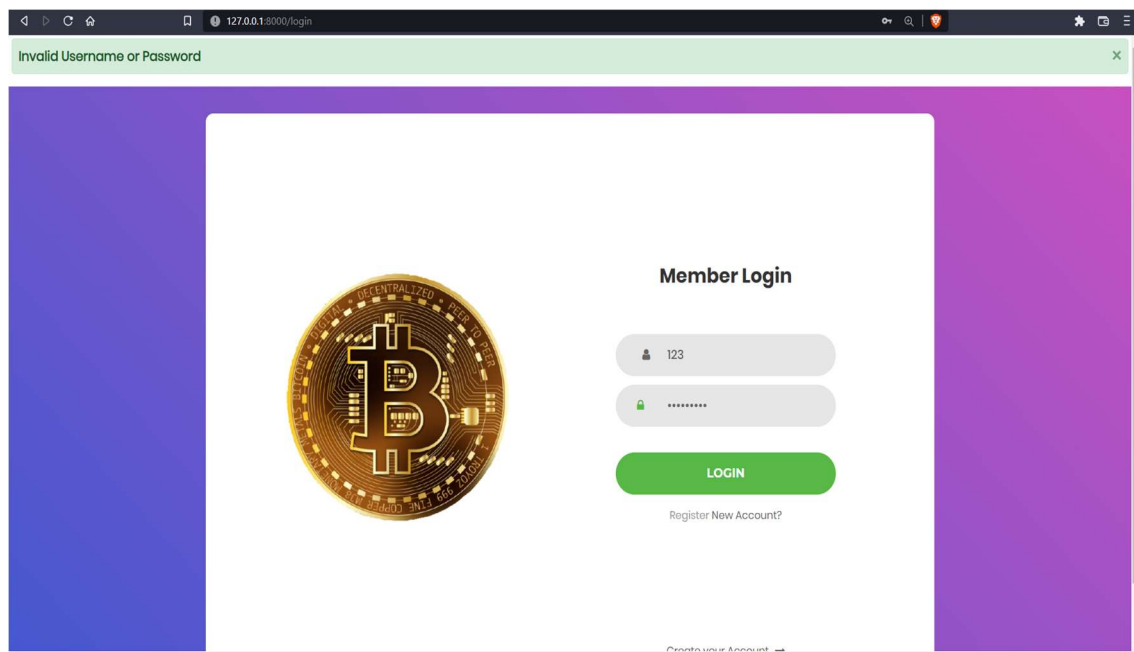

figure 17: Test Case-1

4.2.2 Test case-2

In signup page, User have to enter valid original email id. Otherwise, system won't accept that email.
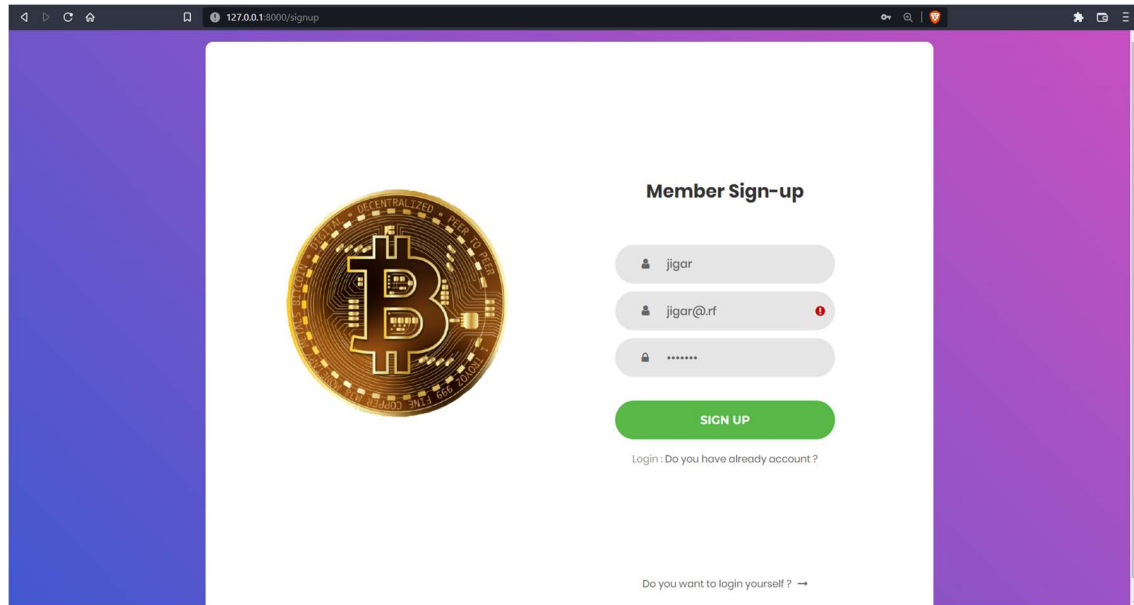

figure 18: Test case-2

4.2.3 Test case-3

In signup page, User have to enter valid password which means password length must be 5 or more than 5.
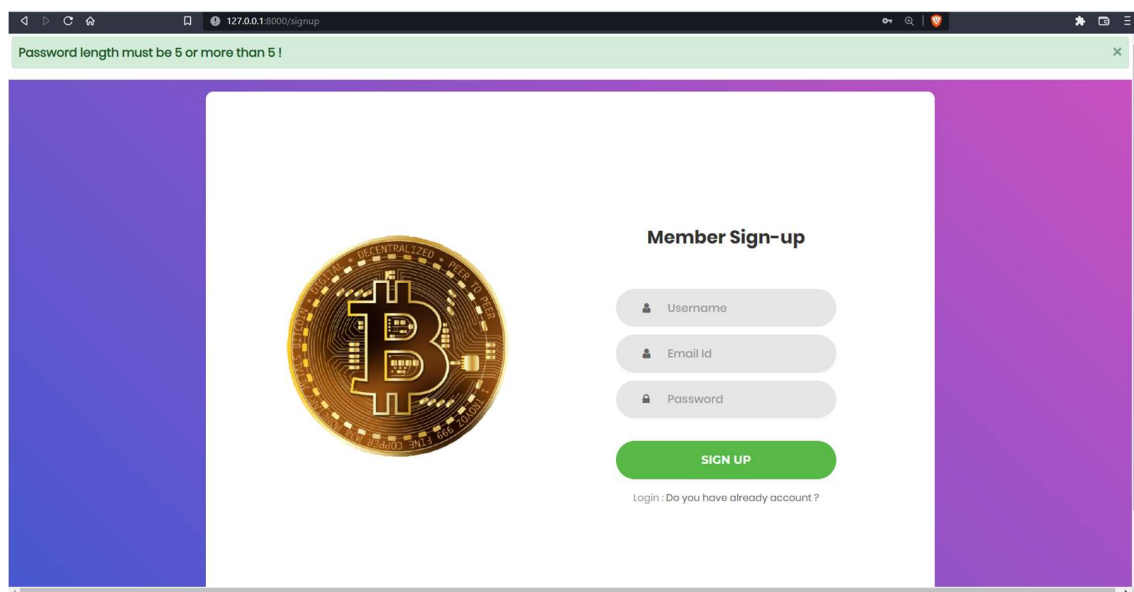

figure 19: Test case-3

4.2.4 Test case-4

When User entered Correct username and password, user can login successfully in the system.
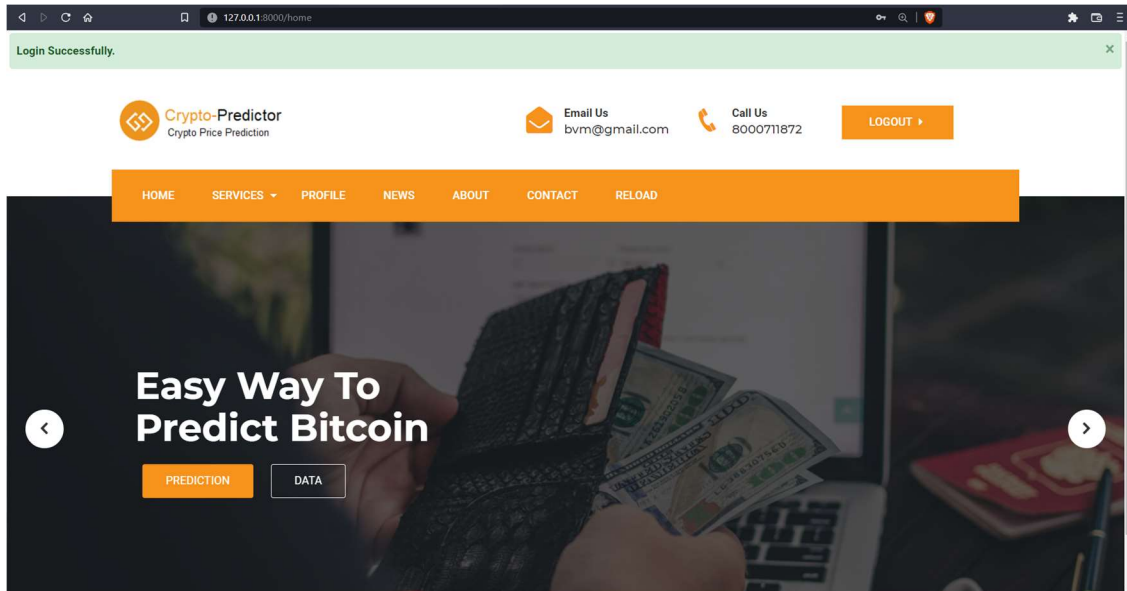

figure 20: Test case-4

4.2.5 Test case – 5

User have to select one coin for random forest. And then system gives output according to this coin.
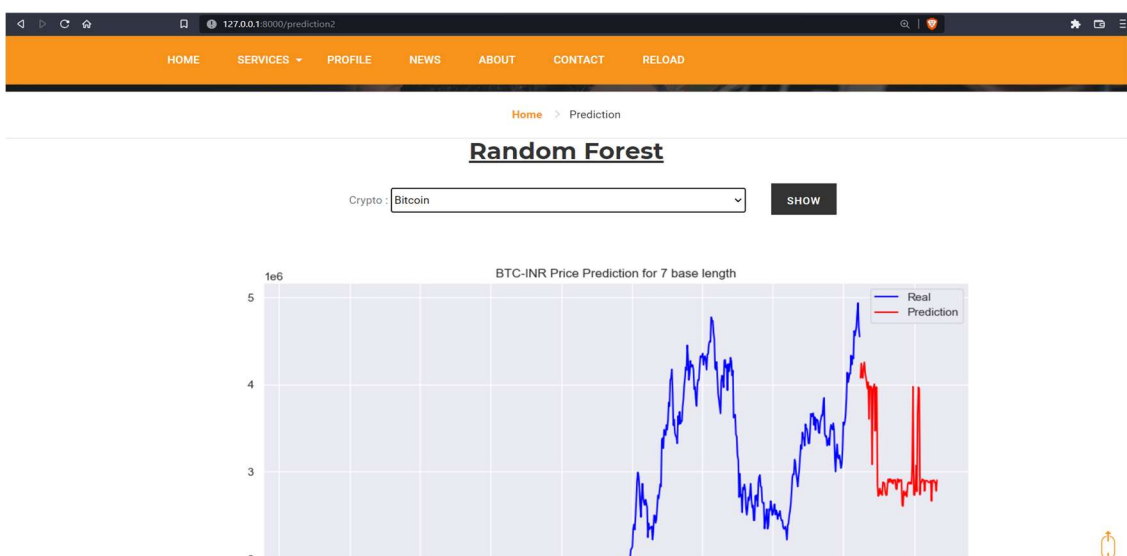

figure 21: Test case-5

CHAPTER 5: CONCLUSION & FUTURE WORK

5.1 Conclusion:

We can conclude from this project is that we found out from some research papers that two machine learning random forest and LSTM RNN are working best on time series analysis. So that we have tried these algorithms and find out that Random Forest and LSTM RNN are around 80 to 85% accurate. Also, as we all know that this kind of markets are very unstable and some rummers can break the whole market flow so that it is very difficult to predict this kind of system. But we tried our best to make this system working in normal market conditions.

5.2 Future Work:

As perspective of future work, we can work on the direction to add some special ability in this kind models so model can automatically fetch live news and based on related news assign some credit to news and based on that credit model have to find how much market will be going in upward or how much will be going in downward.

CHAPTER 6: REFERENCES

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