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School of Mathematical and Physical Education

Department of Computer Science

Crypto Currency Price Prediction

by

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(September 2021)

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Declaration

I hereby declare that the content of this work was entirely produced by me under the supervision of Dr. Issac Wiafe at the Department of Computer Science, University of Ghana, Legon. Other researchers and publications whose work were referenced in this dissertation are duly cited as appropriate.

Signed by

Vanessa Atta-Fynn _____ (10665130)
(Student)

Dr.Issac Wiafe _____
(Supervisor)

Chapter One

INTRODUCTION

1.1 Background

As the world strides towards becoming a cashless society, cryptocurrency has gained popularity in recent years. Individuals, groups and organizations investing in cryptocurency has grown in number due to high profits from trading. However, investment in cryptocurrency also comes with high risks because of how highly unstable or volatile the currency is. This high volatility is caused by high price changes in the cryptocurency market.

1.2 Problem

The high volatility of cryptocurrency poses great risk to investor. In order to reduce risk, individuals, organizations and groups come together to discuss and attempt to predict the trend of crypto currency prices and speculate on the market.

Predictions made may not always be accurate and individuals who are not in these groups may incur unnecessary or unexpected losses.

1.3 Aim

The purpose of this project is to create a web application which houses a machine learning model to help predict the prices of six altcoins which are – Bitcoin(BTC), Ethereum(ETH), Stellar Lumens(XLM), Litecoin(LTC), Chainlink(LINK) and Cardano(ADA) on the crypto market. This application will serve as a tool in predicting the price of these coins.

1.4 Objectives

This project seeks to achieve these objectives;

- To provide a tool in a form of a model to predict crypto currency prices.
- To display graphically the forecasted prices for better visualization to aid in better and quicker decision making
- To display graphically and help visualize current prices of coins
- To compare price trends graphically
- Create a responsive web-application that can be used on computers and mobile devices.
- Able individuals, groups and organizations make visualize forecasted trends

1.5 Significance of Project

This project seeks to bring into existence a web application(Coin Compass) with its main purpose being to predict prices of the fore mentioned crypto currency coins so as to mitigate risk associated with investing in crypto currency. This tool will help person(s) who may not

have access to groups in which discussions are held to predict and speculate coin prices. It will also be of use to individuals in such groups who need clearer and more certain forecast of trends.

1.6 Scope

This project will run as a web-based application that houses a model that predicts price of six altcoins. It would a section to view current trend of prices and allow for comparison of trends of selected coins. The prediction will be displayed in a form of a graph showing possible range of price changes of the coin that has been selected for prediction.

Chapter Two

SYSTEM ANALYSIS AND DESIGN

2.1 Programming Methodology

Real life problems can be huge and complex to solve. Procedural methodology is the approach used to analyze and plan development of software and controlling of processes involved in development.

The steps taken in effort to understand and develop solution to the problem include:

1. Requirement Specification
2. Problem definition
3. System design
4. Implementation
5. Testing
6. Documentation
7. Maintenance

2.2 Existing SystemS

This project considered two existing crypto currency prediction applications namely Tradingbeasts and Wallerinvestor

Tradingbeast is a website that gives crypto currency price prediction over a long period of time. It provides the maximum and minimum price within a given month within a year. Its prediction is based on past performances of prices.

Walletinvetor is also a website which predicts price of coins. They gave a daily forecast for a maximum of 14-days price forecast. The weakness with this application is short period for prediction. It is more desirable if span of prediction is longer to give investors a cue on what is to come.

2.3 Proposed System

Coin Compass is a web-application taking a cue from existing systems which is aiming to mitigate risk involved in crypto currency trading and investments by making use of deep learning models and data science techniques to predict possible price movement in crypto currency market. It provides the price range within which prices may move and can forecast prices for a maximum of 4 years ahead.

Functional Requirements

1. The application must allow users to specify time frame within with prediction should be made
2. It must allow users to predict price range
3. It must allow users to view price trends over specified time frame or over a given period of time.
4. It must be able to allow users view real-time prices of coins selected
5. It must allow users select multiple coins and display simultaneously on a graph to aid in visual comparison on price changes in selected coins
6. It allow for prediction to made for a maximum of 4 years.

Non-Functional Requirements

1. The application must accurate data forma reliable source to produce accurate results
2. It must have a well-structured layout
3. It should be interactive and responsive
4. It should be able to load data seamlessly from sources.

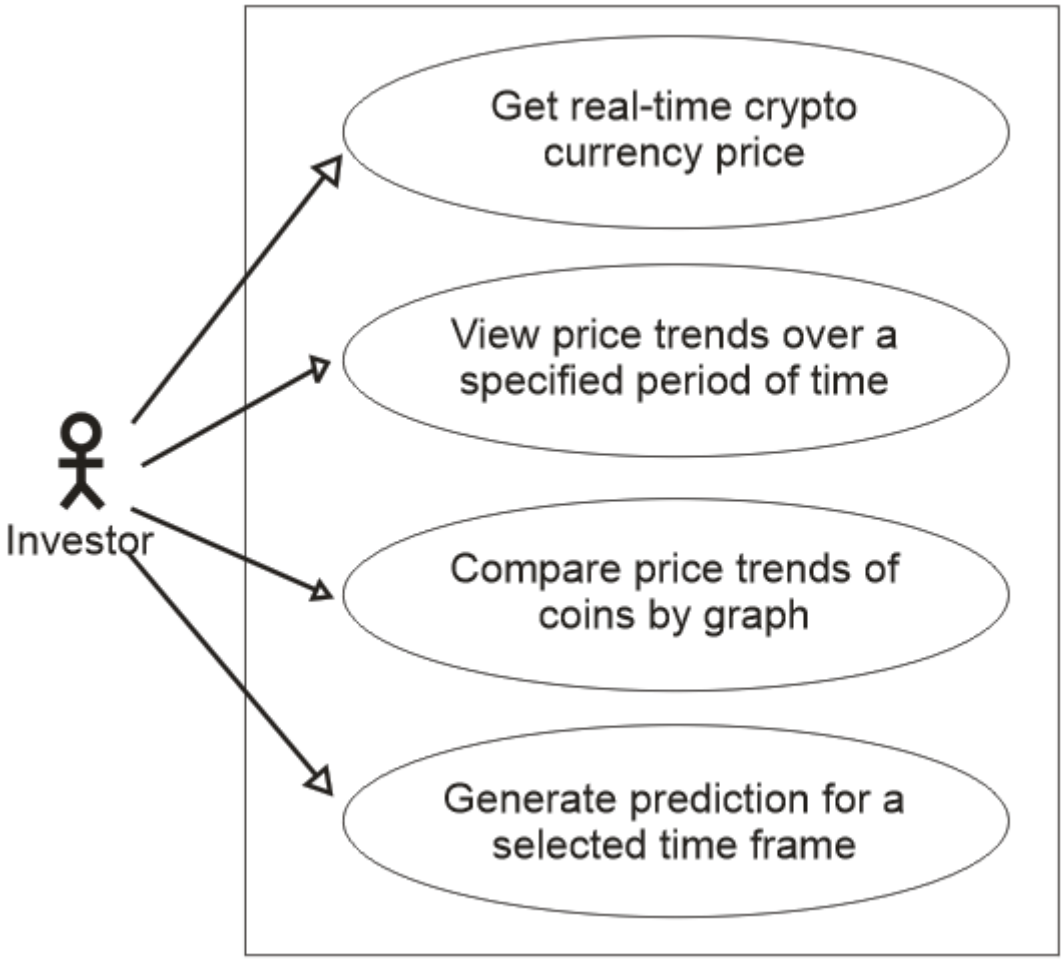
Project Constraints

1. Access to internet before application can be used
2. Needs to run on a web browser

2.4 System Design

This section focuses on the application of concepts of proposed system in development of product.

2.4.1 Use Cases



2.4.2 Wireframes

COIN COMPASS WIREFRAMES

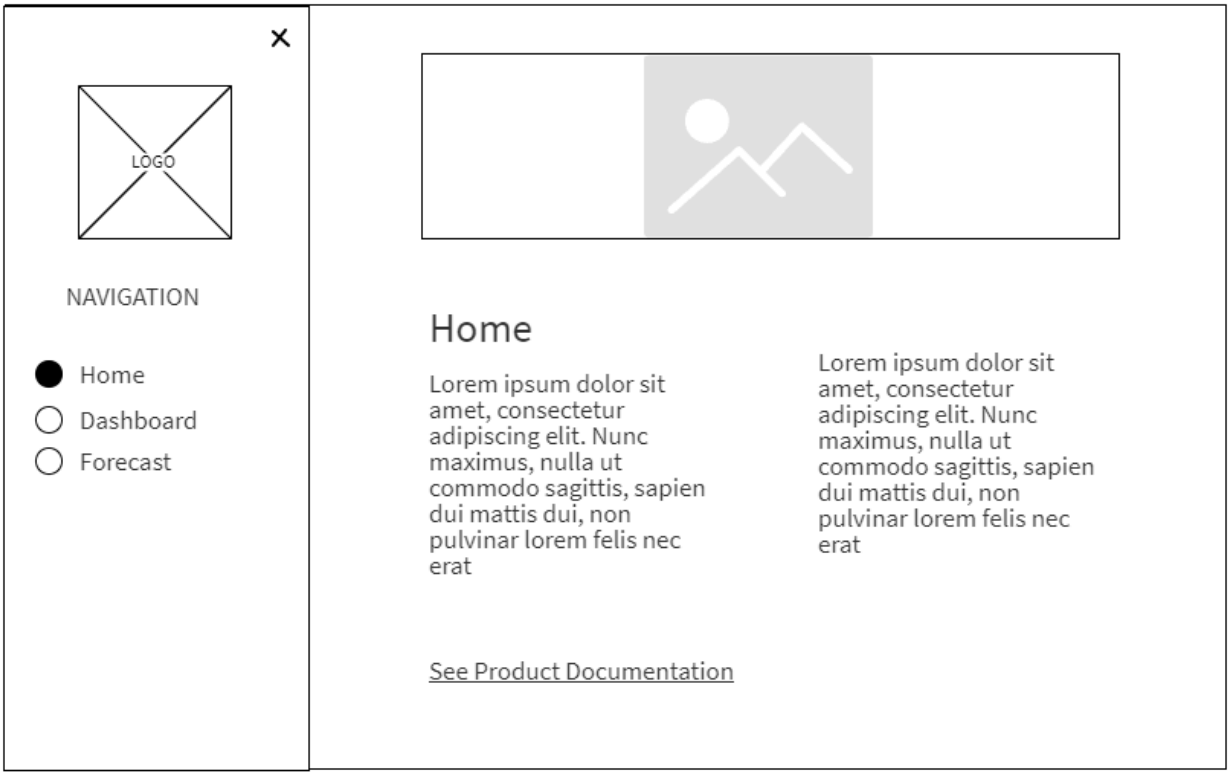


Fig 2.1 Wireframe of Coin Compass home screen

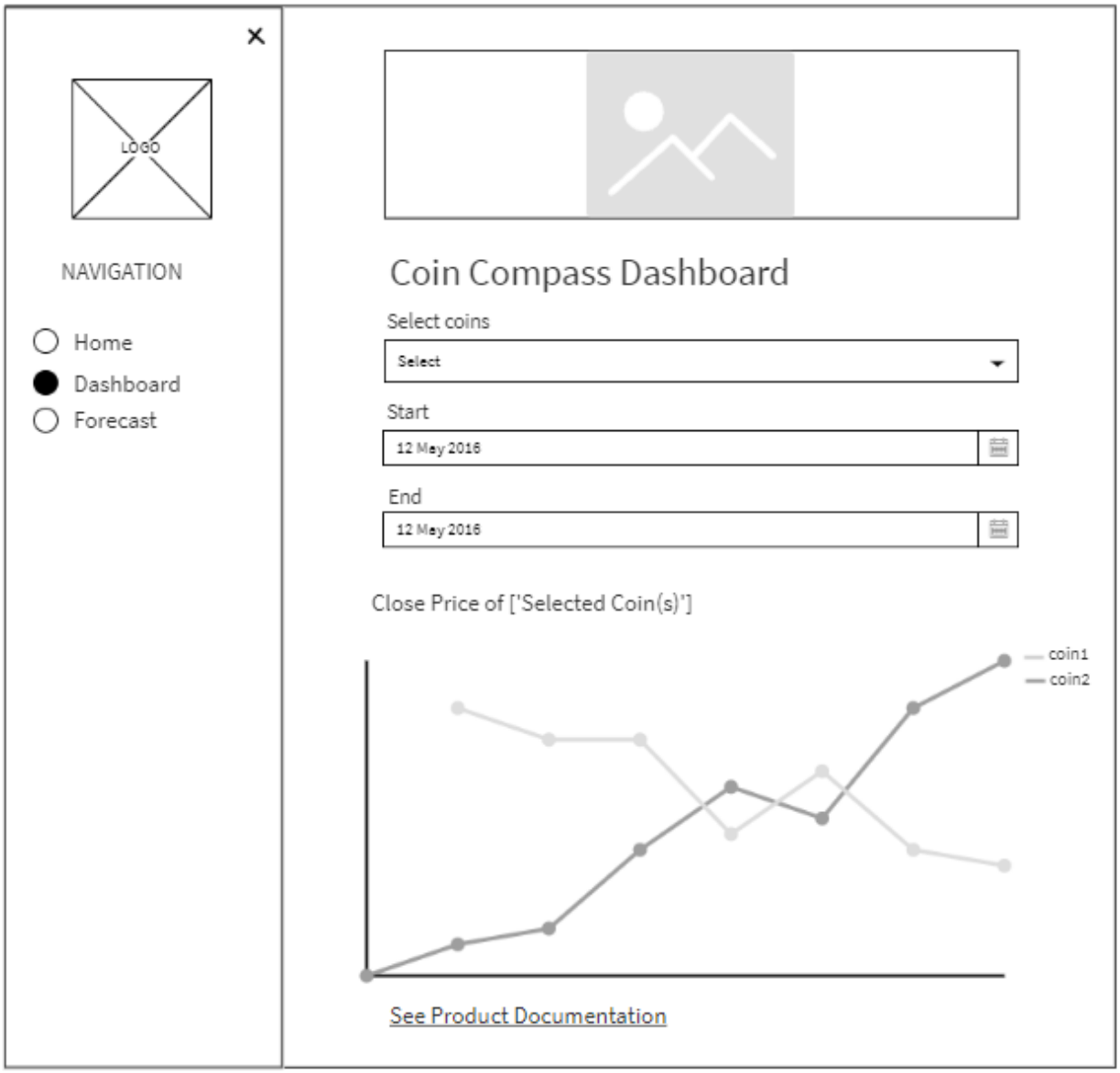


Fig 2.2 Wireframe of Coin Compass Dashboard

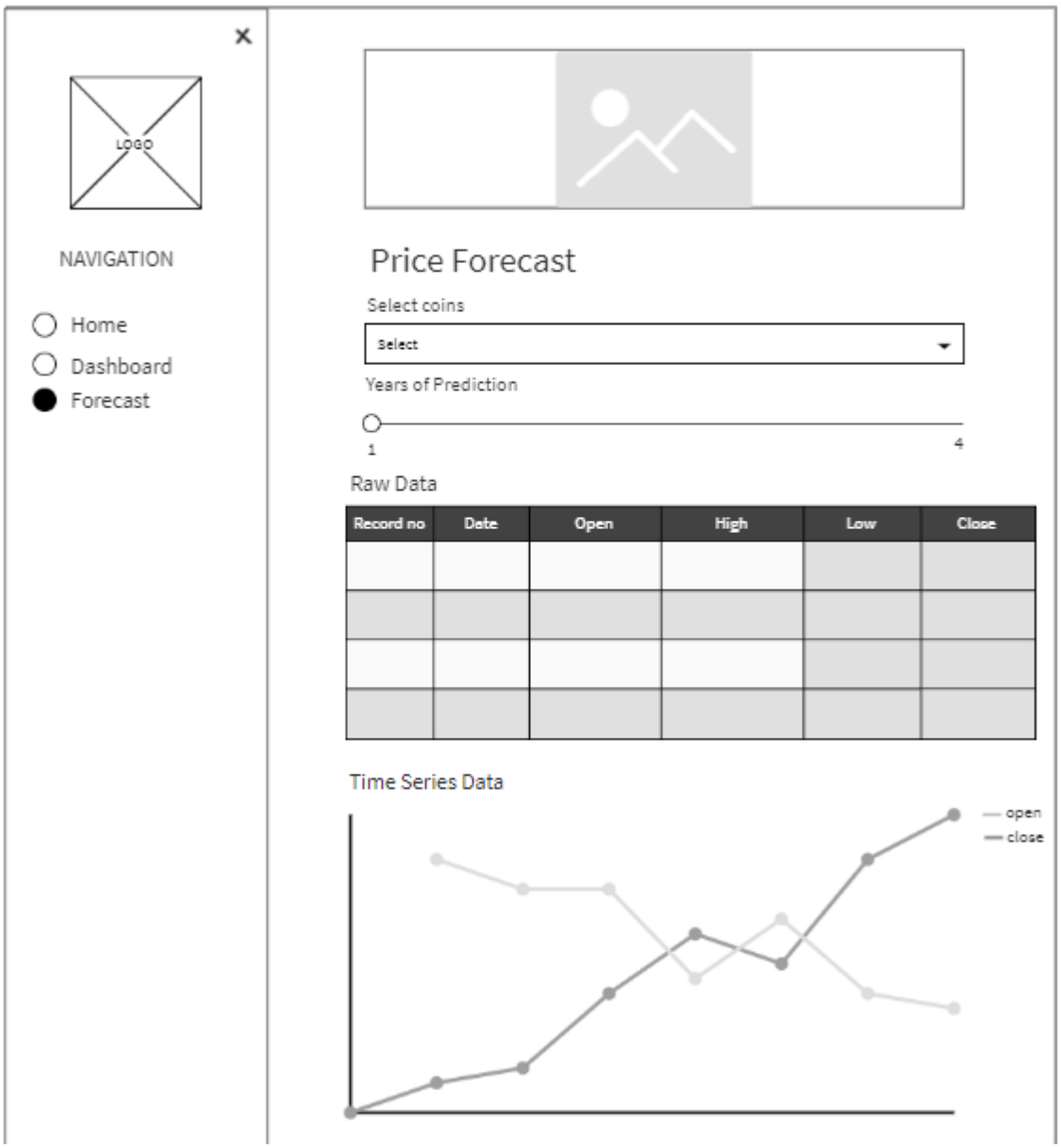


Fig 2.3.1 Wireframe of Coin Compass Forecast Screen

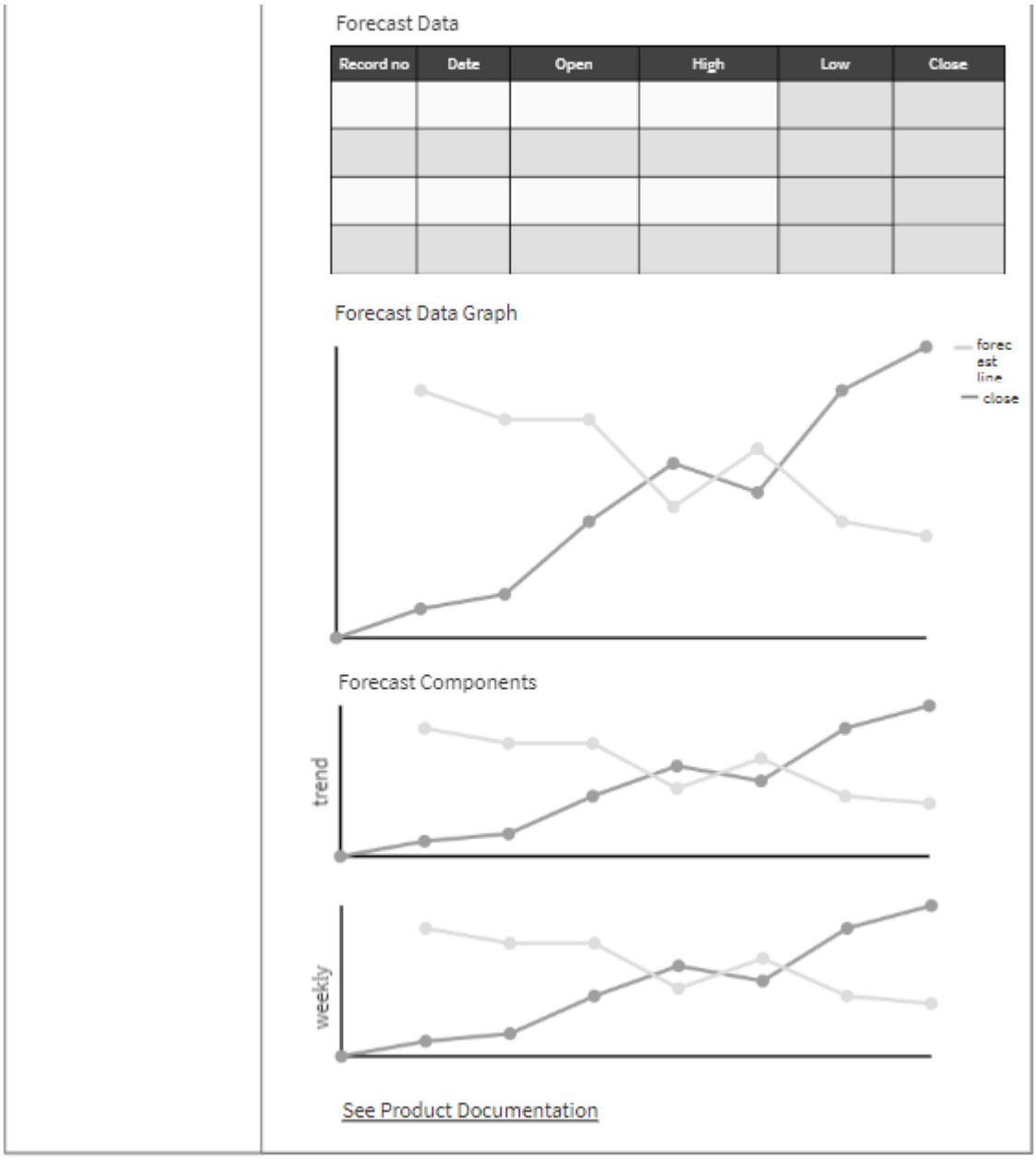
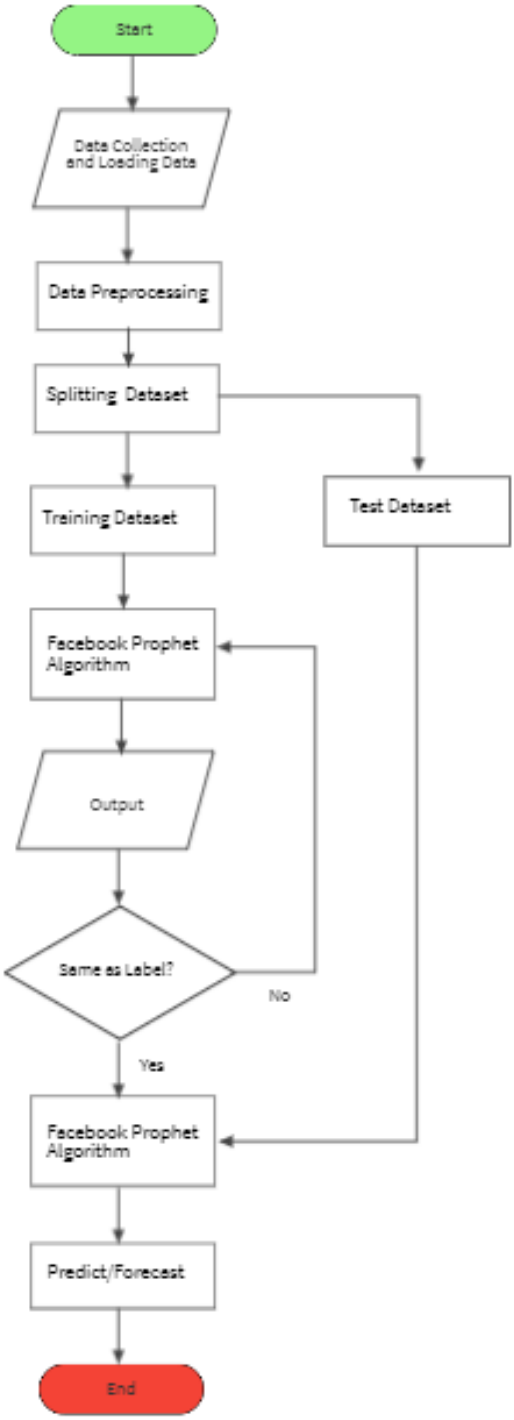


Fig 2.3.2 Wireframe of Coin Compass Forecast Screen Continued

Chapter Three

SOFTWARE IMPLEMENTATION

3.1 Flowchart



3.2 Some Software/ Tools Used

The Software and tools used for the completion of this project are:

1. Jupyter Notekook IDE from Anaconda
2. Command Prompt from Anaconda
3. Sublime Text
4. MockFlow
5. CorelDraw X8

3.3 Programming Languages Used for this project:

1. Python 3
2. Streamlit
3. HTML
4. CSS

Chapter Four

SOFTWARE TESTING AND MAINTENANCE

4.1 Testing

Testing refers to crosschecking the product against the expected requirements of the system to remove bugs and errors and make sure the system is doing what it was meant to do.

4.2. Unit and Integration Testing

At this point, each component of the web applications was tested separately to ensure it works correctly by itself(Unit Testing). After that the components were assemble together with continuous testing to ensure that it works correctly (Integration Testing). Errors emerging at these stages were easily handled

4.3 System Testing

This stage followed after integration testing and focused on the functional and non-functional aspects of the product. Here, performance, operator and user's smooth interaction with system nd software documentation were considered and focused on

4.4 Functional Testing

At this stage, the system was cross checked to ensure that it met all its functional requirements such as the system being able to allow users choose the time frame for prediction and that allow for multiple coins to be selected for comparison.

4.5 Performance Testing

Here, Coin Compass was run on different web browsers to check for irregularities, the speed of the platform was checked , the performance of the machine learning model was checked and the responsiveness of the web application was also checked.

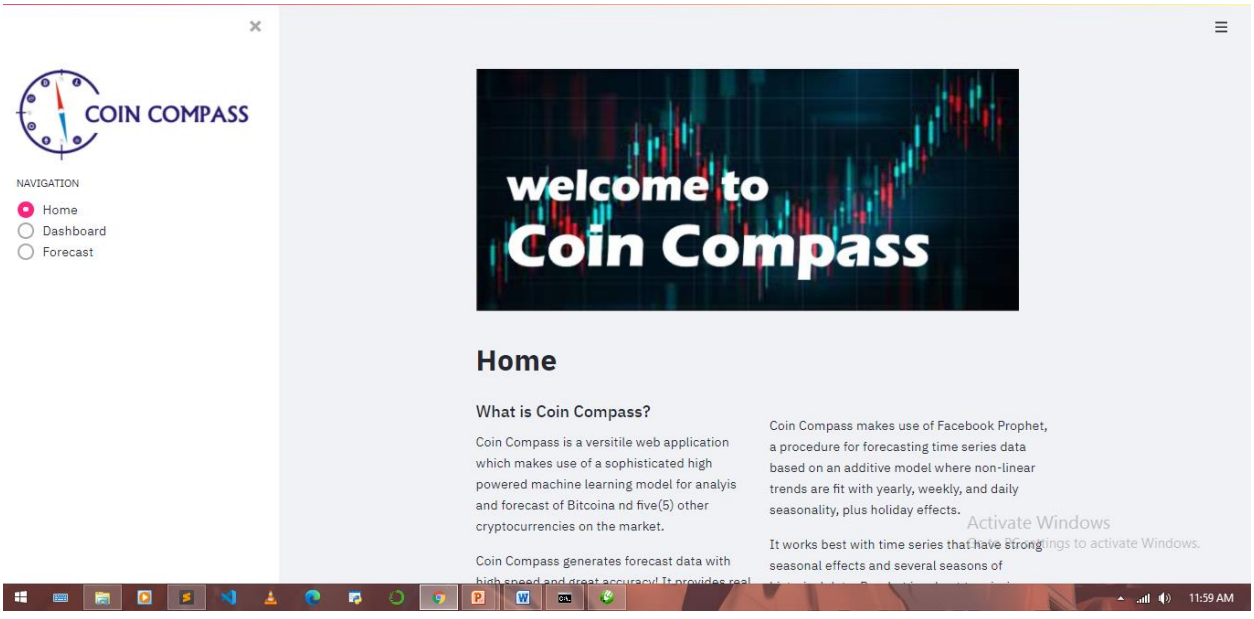
4.6 Maintenance

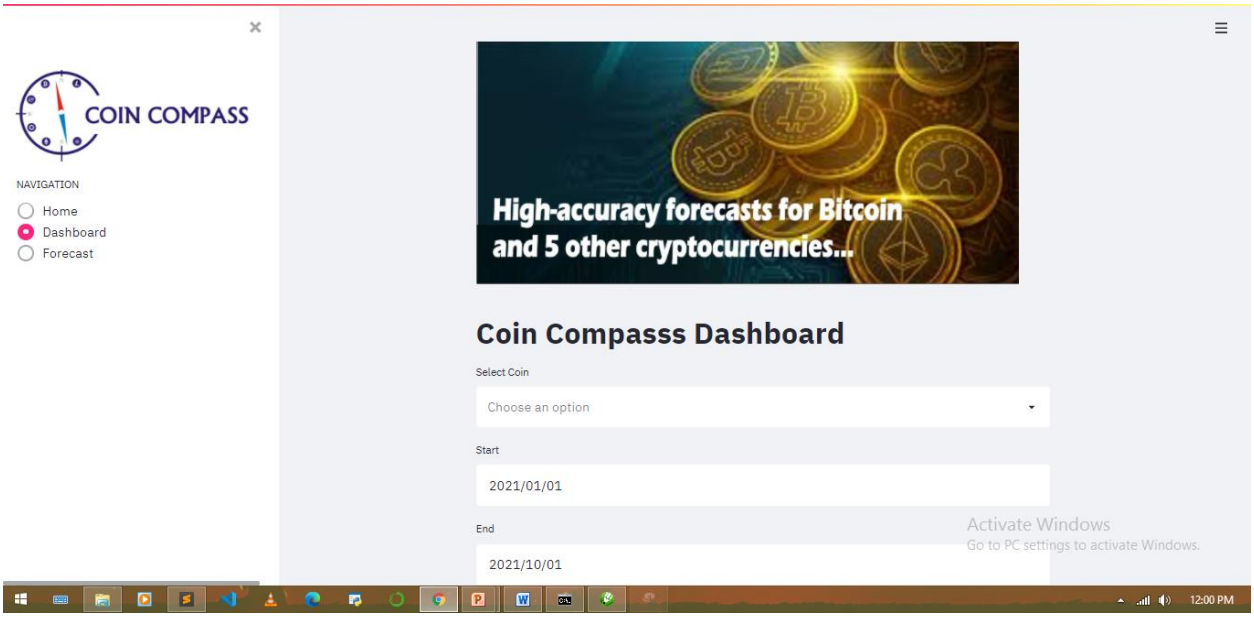
Comments, indentations and good documentation was used during product development so as to make maintenance of system easier. Also, all languages and used for development are quite popular and very recent (up to date). These measures were considered so as to make it easier to maintain the system in the future.

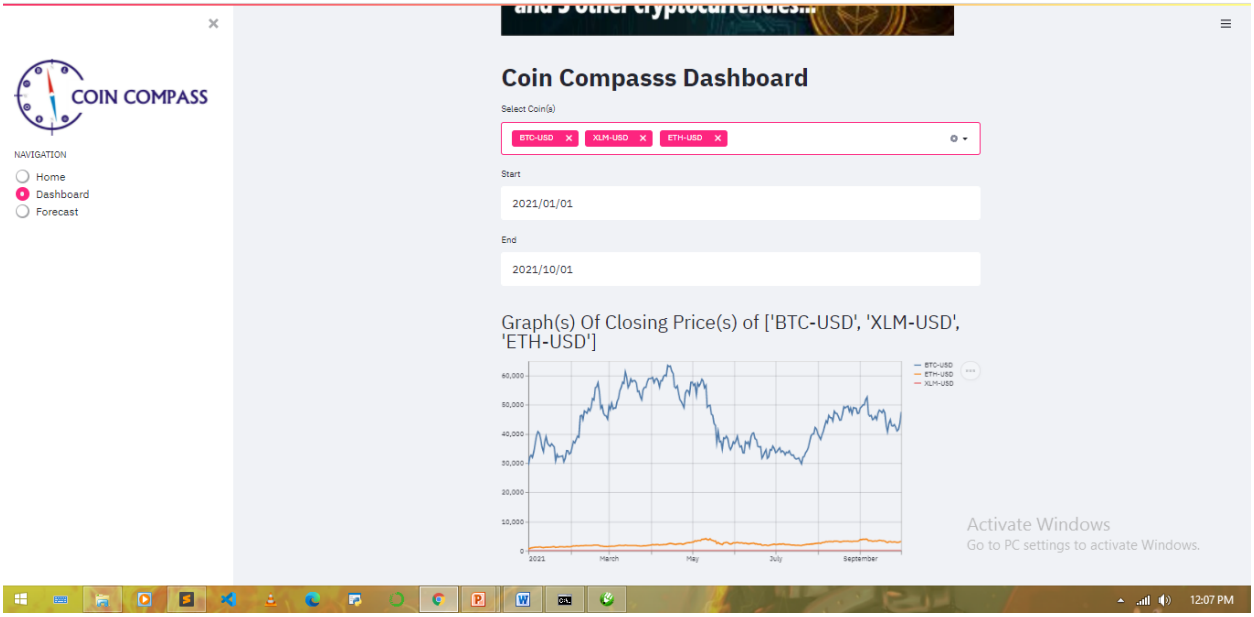
Chapter Five

FINAL PRODUCT AND CONCLUSION

5.1 Final Application Screenshots




COIN COMPASS
NAVIGATION
Home
Dashboard
Forecast
High-accuracy forecasts for Bitcoin and 5 other cryptocurrencies...
Coin Compasss Dashboard
Select Coin
Choose an option
Start
2021/01/01
End
2021/10/01
Activate Windows
Go to PC settings to activate Windows.
12:00 PM


COIN COMPASS
NAVIGATION
Home
Dashboard
Forecast
Coin Compasss Dashboard
Select Coin(s)
BTC-USD
XLM-USD
ETH-USD
Start
2021/01/01
End
2021/10/01
Graph(s) Of Closing Price(s) of ['BTC-USD', 'XLM-USD', 'ETH-USD']
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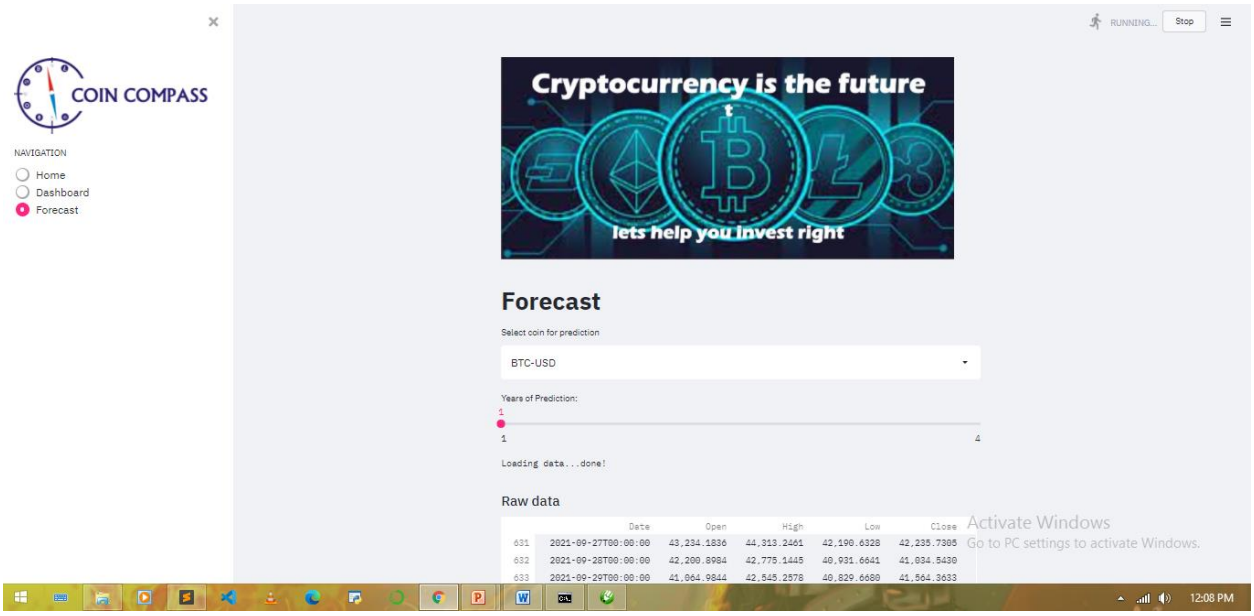
COIN COMPASS
NAVIGATION
Home
Dashboard
Forecast
RUNNING...
Stop
Cryptocurrency is the future
lets help you invest right
Forecast
Select coin for prediction
BTC-USD
Years of Prediction:
1
1
4
Loading data...done!
Raw data
Date Open High Low Close
631 2021-09-27T00:00:00 43,234.1836 44,313.2461 42,190.6328 42,235.7305
632 2021-09-28T00:00:00 42,200.8984 42,775.1445 40,931.6641 41,034.5430
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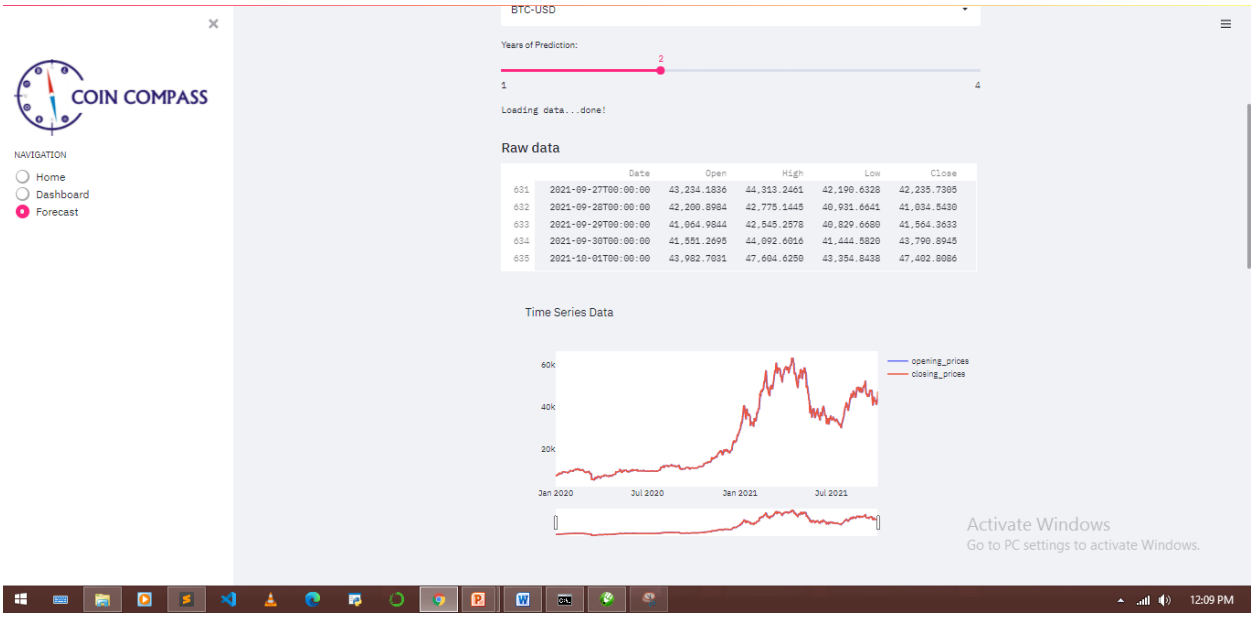
BTC-USD
COIN COMPASS
NAVIGATION
Home
Dashboard
Forecast
Years of Prediction:
2
1
4
Loading data...done!
Raw data
Date Open High Low Close
631 2021-09-27T00:00:00 43,234.1836 44,313.2461 42,190.6328 42,235.7305
632 2021-09-28T00:00:00 42,200.8984 42,775.1445 40,931.6641 41,034.5430
633 2021-09-29T00:00:00 41,064.9844 42,545.2578 40,829.6680 41,564.3633
634 2021-09-30T00:00:00 41,551.2695 44,092.6016 41,444.5820 43,790.8945
635 2021-10-01T00:00:00 43,982.7031 47,604.6250 43,354.8438 47,402.8086
Time Series Data
60k
40k
20k
Jan 2020
Jul 2020
Jan 2021
Jul 2021
opening_prices
closing_prices
Activate Windows
Go to PC settings to activate Windows.
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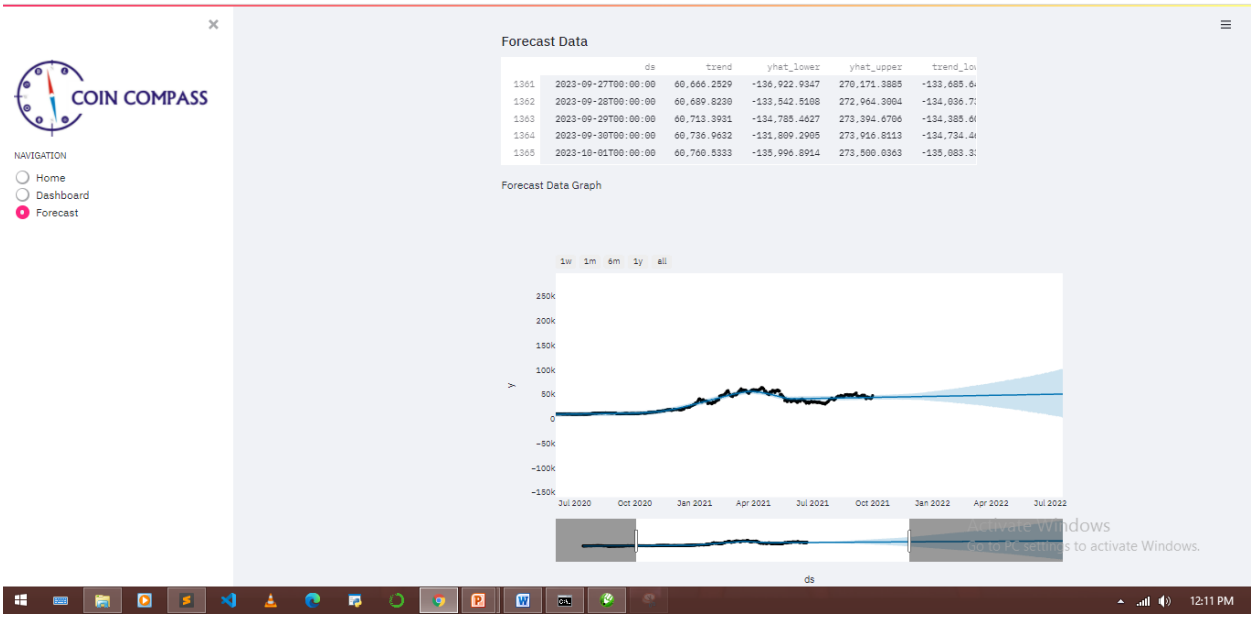

5.2 Conclusion

At the end of this project, the crypto currency price prediction application (Coin Compass) was created to meet all its expected requirements. This application can now serve as a tool to make predictions of the possible trend of prices and aid individuals, groups and organizations to make better investment decisions when it comes to crypto currency.

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