A Project Report on

Stock Price Prediction using Machine Learning

For the Fulfillment of the Degree of
Master of Computer Applications
Semester – VI

Submitted by

KaPatel Preyash S. (18034211003)

Guided by

Dr. Jigneshkumar A. Chauhan
Submitted to

Acharya Motibhai Patel Institute of Computer Studies,
GANPAT UNIVERSITY
Dec-April 2021

23/04/2021

PROJECT COMPLETION CERTIFICATE

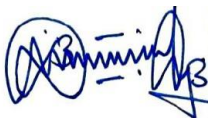TO WHOM SO EVER IT MAY CONCERN

This is to certify that the following student of Master of Computer Applications, Semester-VI from AMPICS, Ganpat University have completed their full time project work entitled **"Stock Price Prediction using Machine Learning"** satisfactorily as trainee at our place from period Dec-2020 to April-2021.

Sr. No.	Enrollment No.	Full Name
1	18034211003	KaPatel Preyash Sanjaybhai

The project work embodies the original work done by him during full semester project training period. We wish the best for his future endeavors.

Thanking You,

With Regards.

Project Guide

Mr. Pravin Dangar
E-mail:
pravin.dangar@madhda.com

Company/ Organization Seal

For, HR/Proprietor

Mr. Gopal Bharavadiya
E-mail:
contact@madhda.com

25/04/2021

C E R T I F I C A T E

T O   W H O M   S O   E V E R   I T   M A Y   C O N C E R N

This is to certify that the following student of Master of Computer Applications, Semester-VI have completed their full time project work entitled **"Stock Price Prediction using Machine Learning"** satisfactorily as fulfillment of successful completion of subject- **P16A1SDP2: SYSTEM DEVELOPMENT PROJECT – II** for the period from month Dec 2020 to April 2021.

Sr. No.	Enrollment No.	Full Name
1	18034211003	KaPatel Preyash Sanjay

Internal Guide	Project Coordinator	HOD/Dean
Dr. Jignesh A.Chauhan	**Dr. Jignesh A.Chauhan**	**Dr. Satyen M. Parikh**

I N D E X

1. Project or Company Profile

Project Profile

Project Title	Stock Price Prediction using Machine Learning
Project category	Web Application
Objective	To Predict the stock price based on the past and upcoming events.
Front End	Django
Back End	Django, Python
Tool	Anaconda, Google Colab
Server	XAMP
Documentation Tool	Office 365
Company Name	MADHDA BUSINESS SOLUTIONS PVT LTD
Internal Guide	Dr. Jigneshkumar A. Chauhan
External Guide	Pravin Dangar
Developed By	Preyash Sanjay KaPatel (1803421003)
Group No	19

About the Company

Company provides a complete solution with high performance with helping hand from startup level to the enterprise level.

We provide Microsoft Dynamics ERP solutions to our clients worldwide. We work closely to provide consulting, maintenance, Implementation support, Upgrades, Re-architect to our client. To make your company and products smarter are more successful.

- We provide custom solution to our client.
- An employee is the most valuable asset for an organization.
- We design, implement and manage your Microsoft Dynamic ERP.
- We utilize our expertise in providing sustainable enterprise solutions to customers and help their businesses maximize potential.
- For us every business is built on good relation with client.
- The leaders at Madhda about their employees' well-being, happiness and success.
- We are driven by a set of guiding principles which dictate our decisions and responsibilities towards our people and customers.
- To provide businesses with the ERP software and knowledge they need to succeed in a competitive market.
- We conduct business ethically.
- We embrace positive change, innovation, and continuous improvement.

In return our employees feel recognised and appreciated for their contributions to the company.

2. Functional Requirement Specification

2.1 Module Specification

1) Login:
   - Admin and Account Holder can access website by successfully login

2) Watchlist:
   - User can add remove stock from watchlist.

3) Holdings:
   - Here user can see there stock holding if they have.

4) Predictions:
   - In this module user can predict the stock price.

2.2 User Specification

1) Prediction:
   - There should be option to predict the share price.

2) Recording of stock for Study:
   - Learner should be able to add get latest price.

3) Buy and Sell:
   - Learner should be able to buy and sell stock at any price for study purpose.

3.1 About Existing System

The existing system works as follow:

- Money related transaction require high alertness of statistical insights of history and future events, in such case taking decision of stake sale, hold or buy are difficult.
- Before taking decision, we need to look at the past data, stock patterns, Recent news and judging the price takes time and it might end up in slow decision, incomplete information etc.
- Taking the Stake sale/buy/Hold based on emotion and incomplete information may perform false prediction.

3.2 Need for new system

1) Rapid Decision:
   - User can take decision rapidly as it is performed autonomous.

2) Improved Accuracy:
   - User can use the result to take decision for stake sale or hold or buy

3) Based on Historic data:
   - Prediction are based on historic data and past events.

Machine Learning:

▶ Stock price prediction is an important decision in order to gat benefit from stock market.

▶ To predict the stock Price I have used Artificial Neural Network, Which contain three layers:

  ▶ Input Layer : We have number of features equal to number on neurons in input layer

  ▶ Hidden Layer : Set of neurons to store what was learned (can be modified accordingly)

  ▶ Output Layer : Using only one output layer neuron as we are using it for regression problem.

▶ Creating Indicator Functions is also important to create bias in prediction based on what is more important

▶ Following are the Indicator for Stock Price Prediction:

  ▶ RSI (Relative Strength Index):

  ▶ MFI (Money Flow Index)

  ▶ EMA (Exponential Moving Average)

- ▶ RSI (Relative Strength Index):

    - ▶ Measures speed and change of price movements.

        - ▶ It ranges in between 0 and 100

    - ▶ We consider overbought above 70 and oversold below 30 (generally)

        - ▶ RSI = 100 − [100 / (1 + (Average of Upward Price Change / Average of Downward Price Change))]

- ▶ MFI (Money Flow Index):

    - ▶ Related to RSI but incorporates volume too where RSI considers prices only

        - ▶ Typical Price = (High + Low + Close)/3

    - ▶ Next, Money Flow (not the Money Flow Index) is calculated by multiplying the period's Typical Price by the volume.

        - ▶ Money Flow = Typical Price * Volume

- ▶ EMA (Exponential Moving Average):

    - ▶ SMA = avg of price data,

    - ▶ EMA = more weight to data which is more current.

    - ▶ EMA is more sensitive to price movement and it used to determine trend direction

    - ▶ EMA = (K x (C - P)) + P

    - ▶ where,

        - ▶ C = Current Price

        - ▶ P = Previous periods EMA (A SMA is used for the first periods calculations)

        - ▶ K = Exponential smoothing constant

4.   Technical Requirement Specification

4.1 Hardware Requirement (Minimum)

- Client Side:
    - Hardware Requirement:
    - Basic CPU with 700 MHz Speed
    - 1 GB RAM

- Server Side:
    - Inter i3 10th generation
    - GB RAM
    - 250 mb Space in SSD

4.2 Software Requirement (Minimum)

- Client Side:
    - Chrome with 68.0.3440.75 or above Version
    - Good Internet Speed

- Server Side:
    - Chrome with 68.0.3440.75 or above Version
    - High Speed Internet
    - Google Colab
    - Webpage IDE
    - Github Desktop

5. System Flow Chart

System Flow Chart Admin
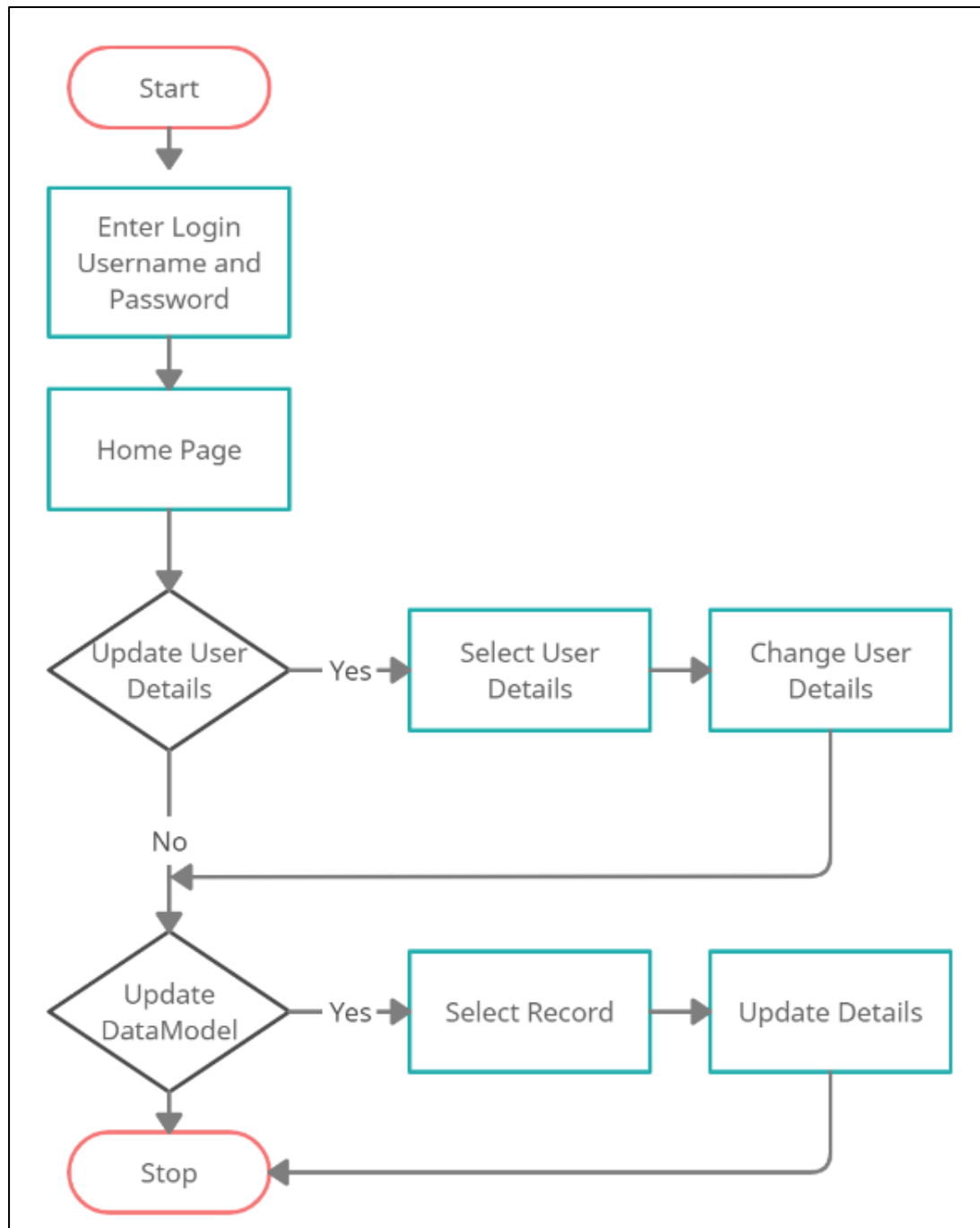
System Flow Chart User
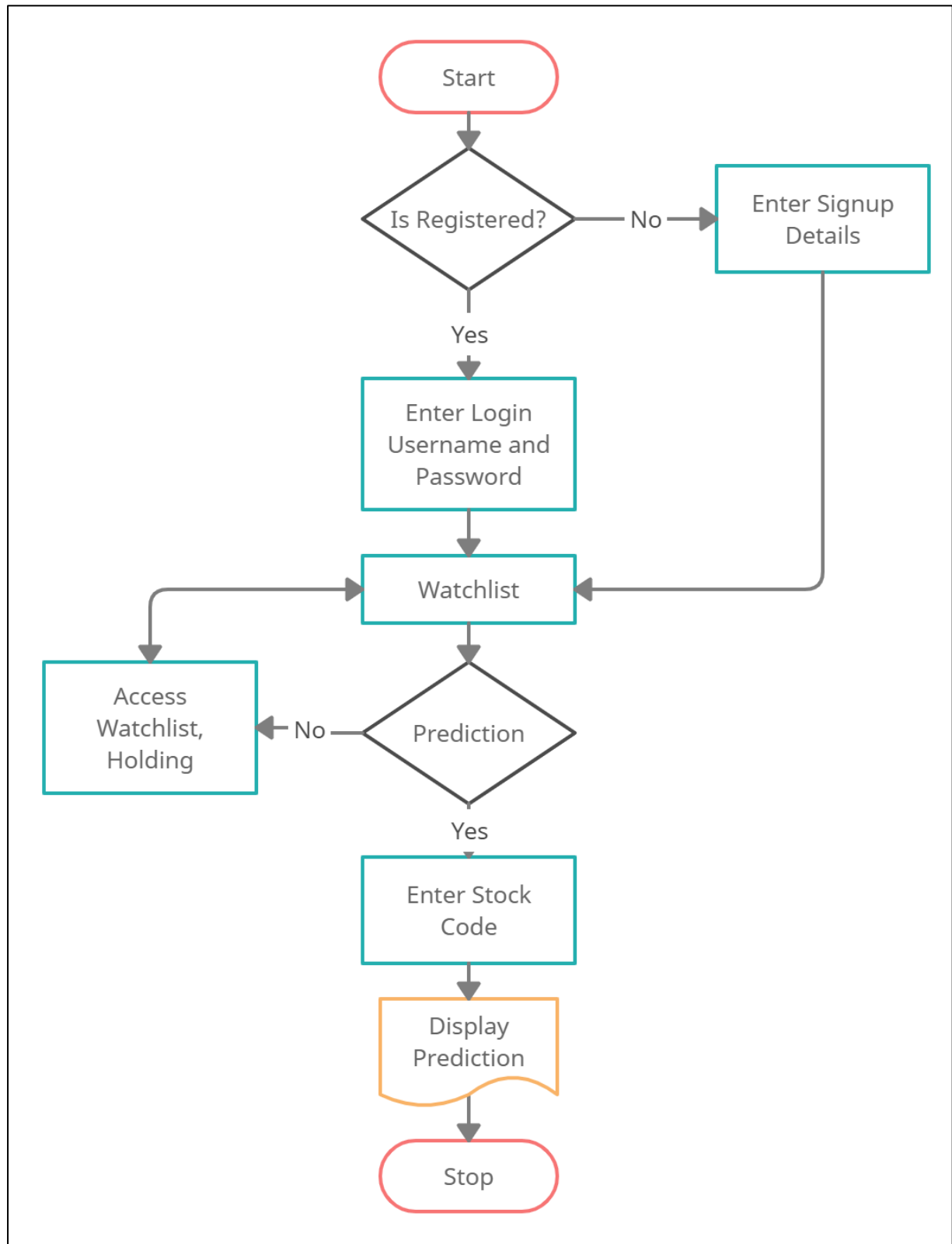
6. UML Diagrams

6.1 Use-case Diagram
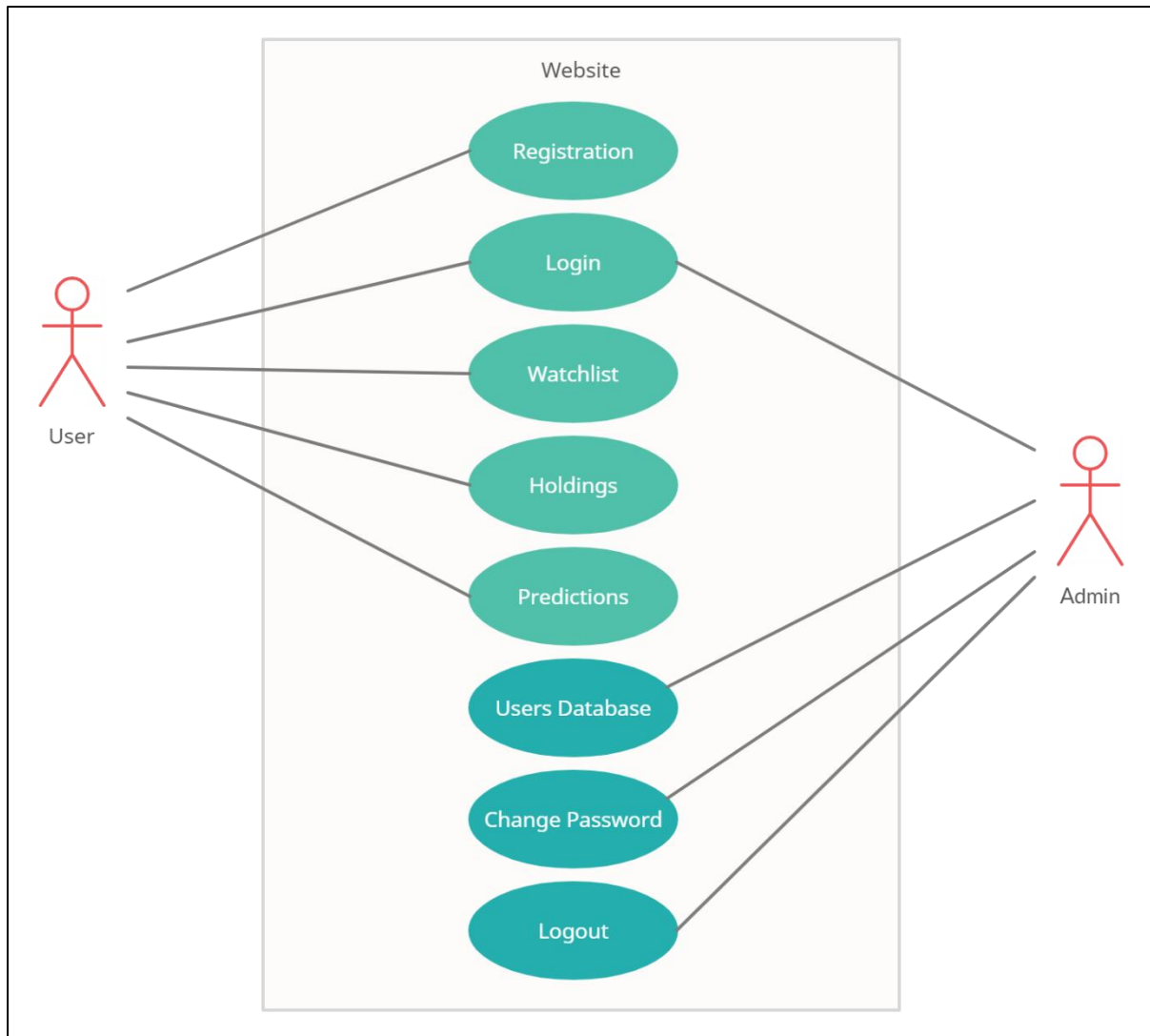
6.2 Activity Diagram

Activity Diagram for Admin
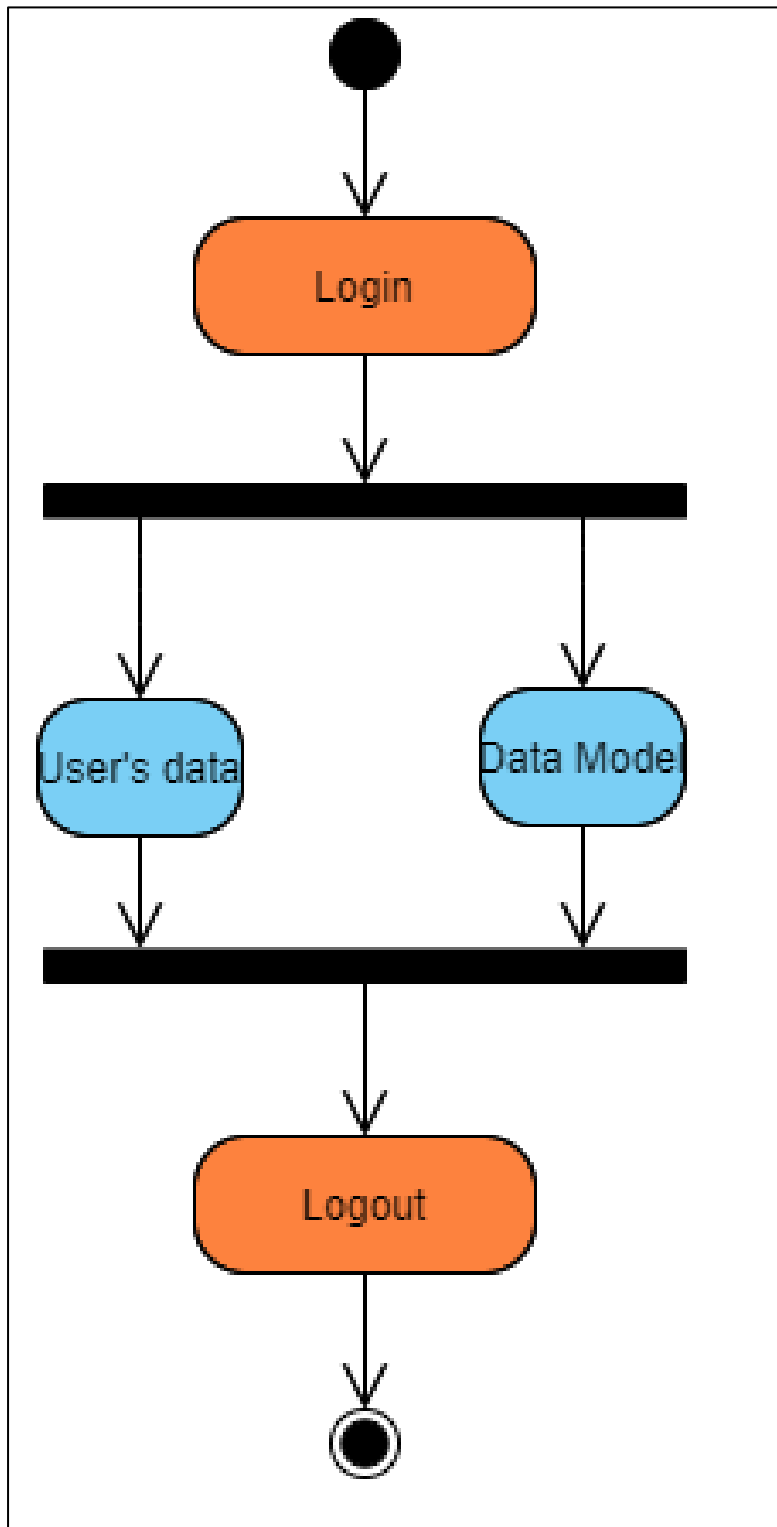
Activity Diagram for User

6.3 Class Diagram

DataModel

id: AutoField
user: CharField
avgCost: FloatField
created: DateTimeField
price: FloatField
qty: IntegerField
symbol: CharField

0..*

User

id: AutoField
date_joined: DateTimeField
email: EmailField
first_name: CharField
is_active: BooleanField
is_staff: BooleanField
is_superuser: BooleanField
last_login: DateTimeField
last_name: CharField
password: CharField
username: CharField

6.4 Sequence Diagram

Sequence Diagram for Admin
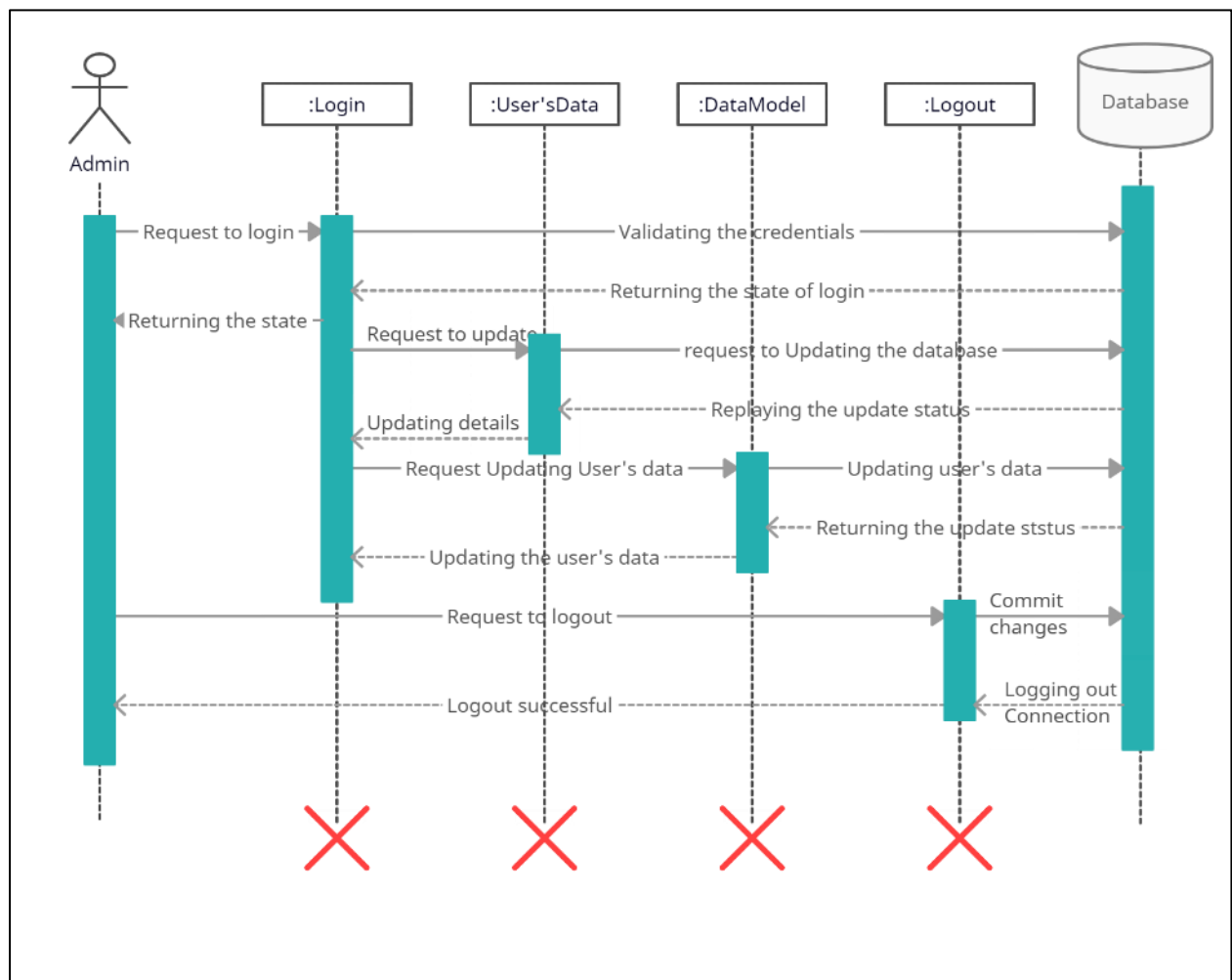
Sequence Diagram for User
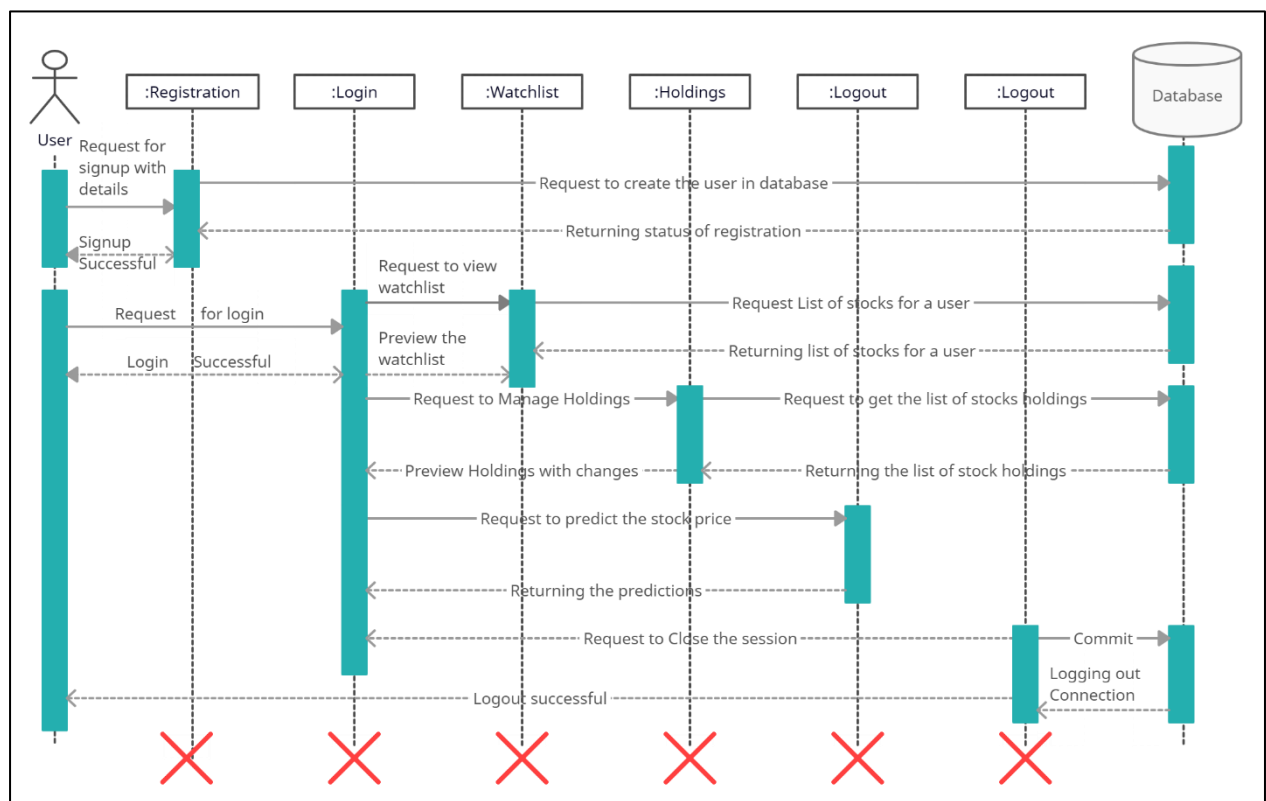
6.5 Deployment Diagram
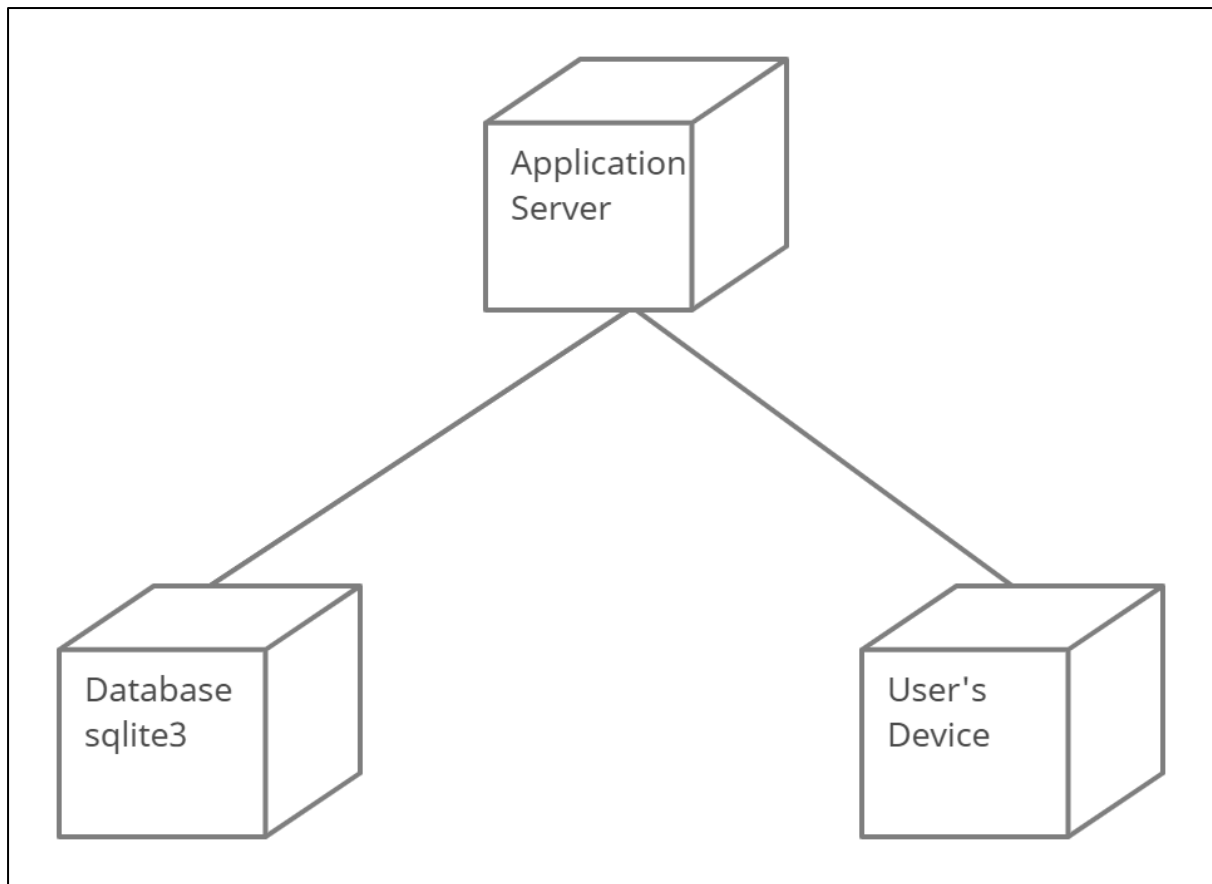
7. Data Dictionary

Name: DataModel

DESCRIPTION:- Represents stock holding and watchlist   Primary Key: id

Sr.No	Field Name	Data Type	Constraint	Description
1	id	IntegerField	Primary Key	Represent Record id
2	user	CharField	Not Null	Represent registered User
3	avgCost	FloatField	Not Null	Represent Average cose
4	created	DateTimeField	Not Null	Represent stock addition date and time
5	price	FloatField	Not Null	Represent last updated price
6	qty	IntegerField	Not Null	Represent quenty
7	symbol	CharField	Not Null	Represent stock symbol

Name: User

DESCRIPTION:- Represents users's details   **Primary Key: id**

Sr.No	Field Name	Data Type	Constraint	Description
1	id	IntegerField	Primary Key	Represent user id
2	Date_joined	DateTimeField	Not Null	Represent date of joining
3	email	EmailField	Not Null	Represent Email id of user
4	First_name	CharField	Not Null	Represent First Name
5	Is_active	BooleanField	Not Null	Represent user status
6	Is_staff	BooleanField	Not Null	Represent user is staff member or not
7	Is_superuser	BooleanField	Not Null	Represent user is super user or not
8	last_login	DateTimeField	Not Null	Represent last login date and time
9	last_name	CharField	Not Null	Represent user's last name
10	Password	CharField	Not Null	Represent password
11	username	CharField	Not Null	Represent username

8.   Input & Output Design

Home Page
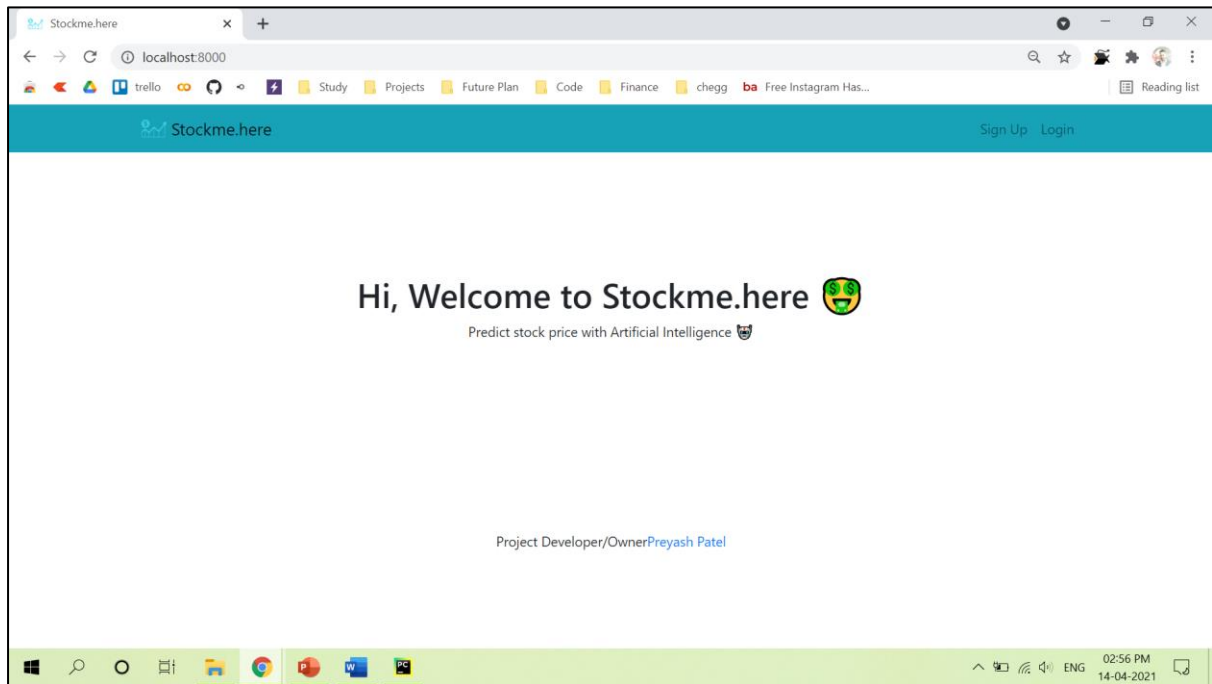
Signup Page:
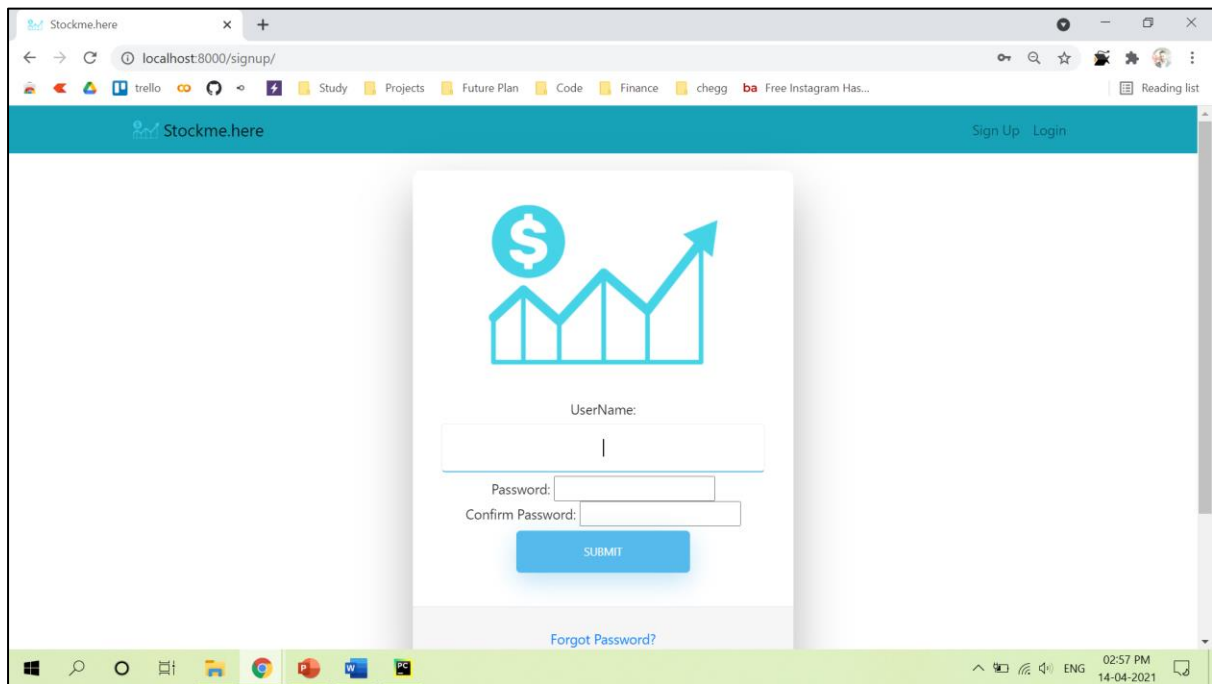
Signup Credential Validation:

Login Page:

Login Credential Validation:

Home after login
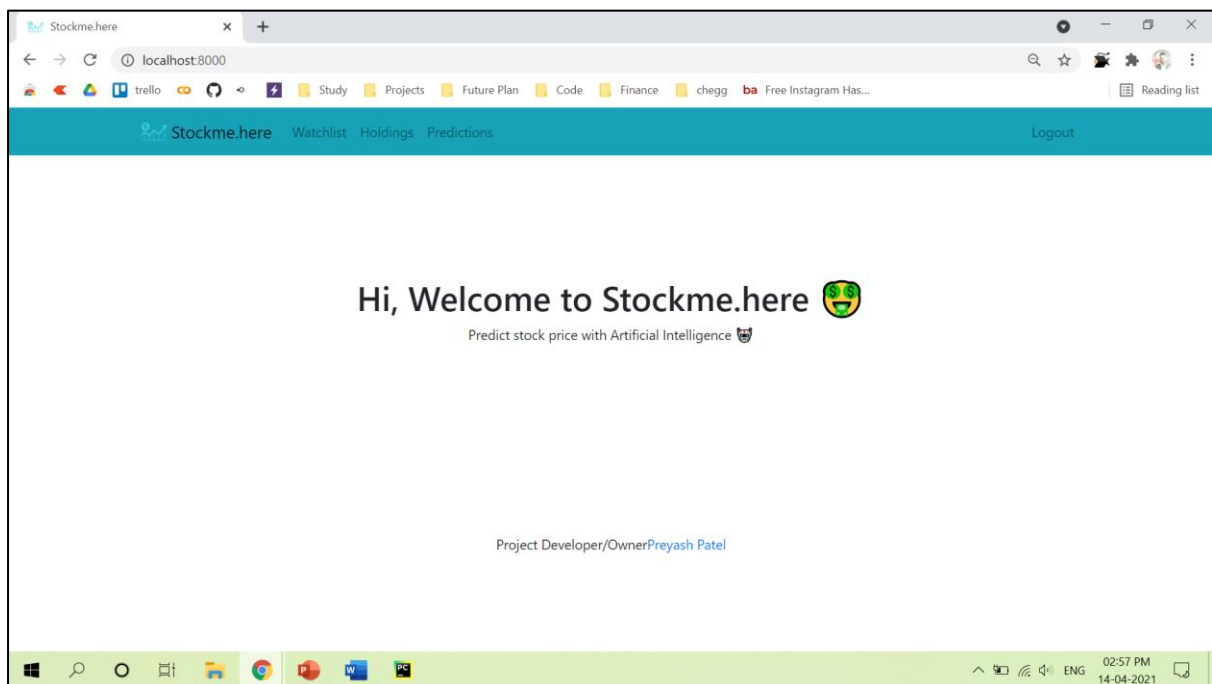
Watchlist Page
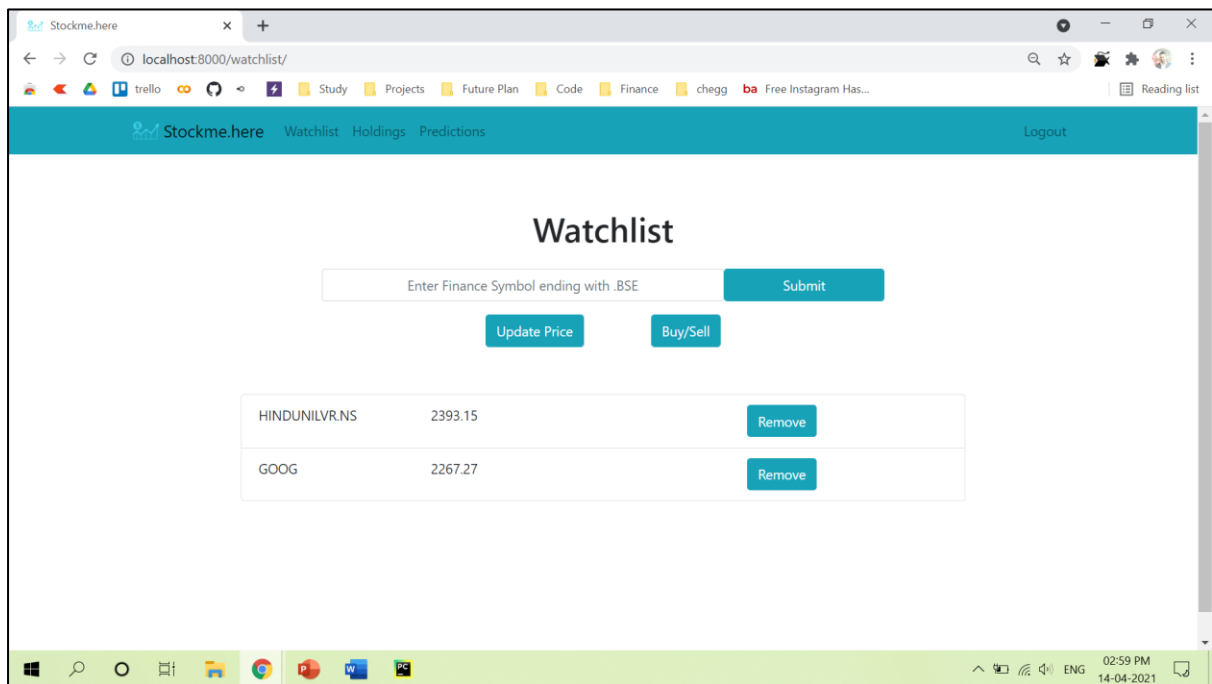
Holdings Page
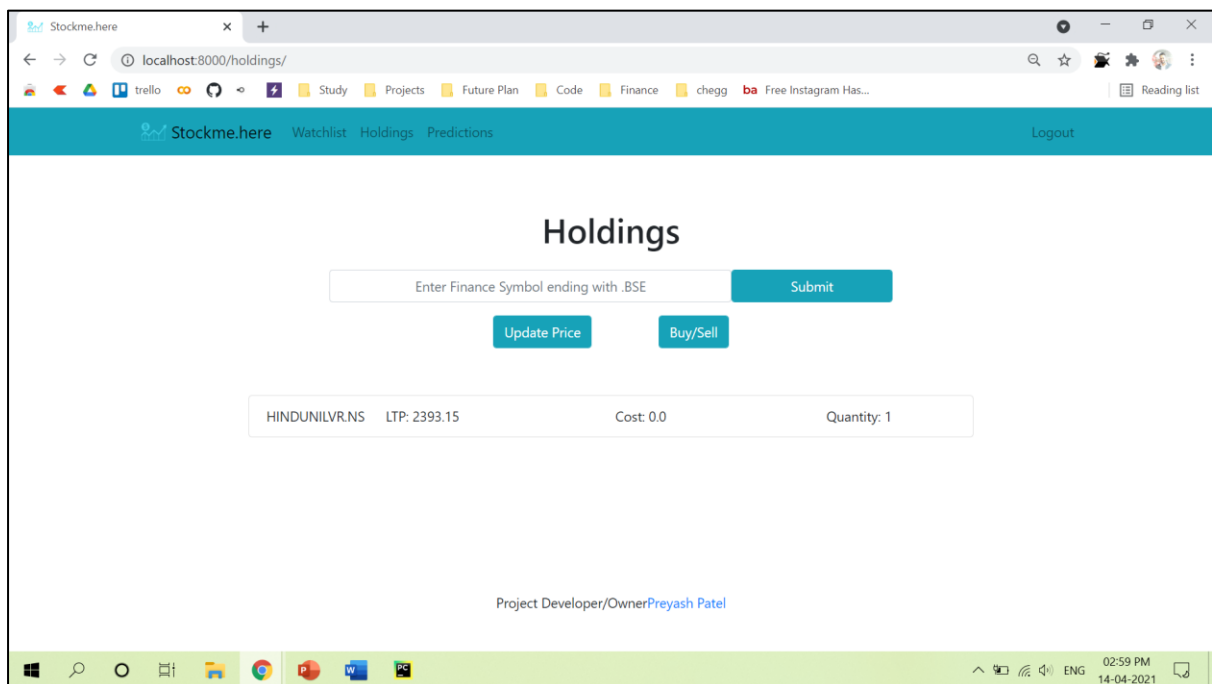
Prediction Page
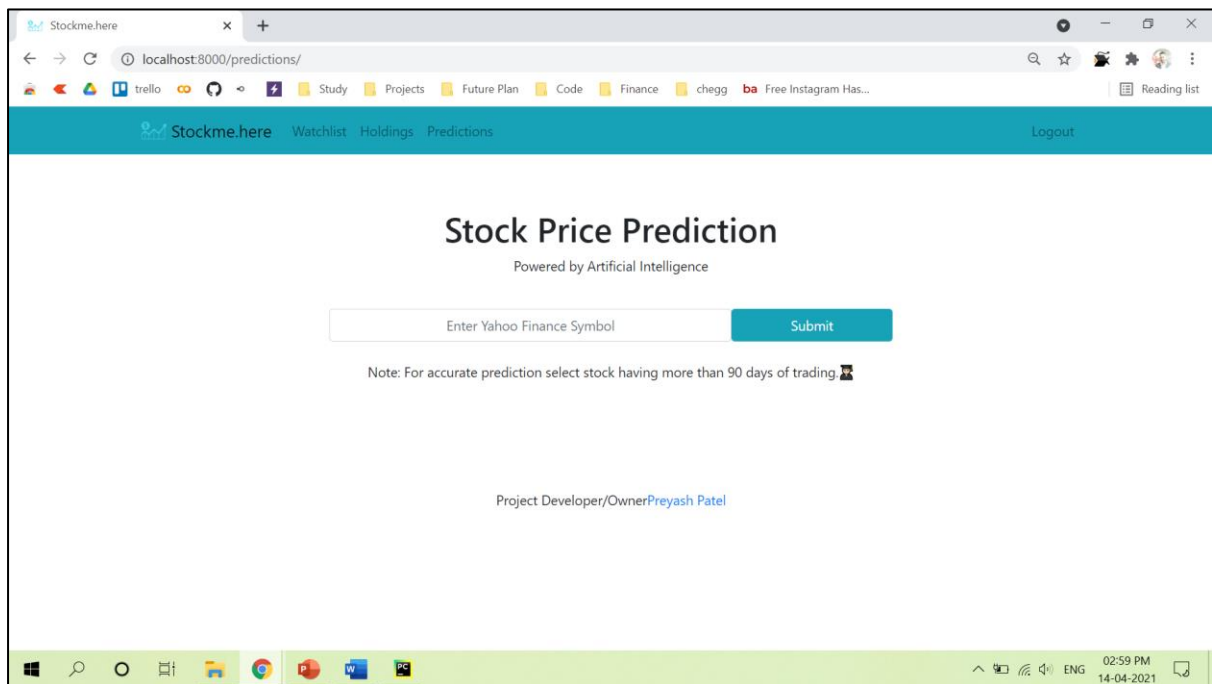
Prediction Page
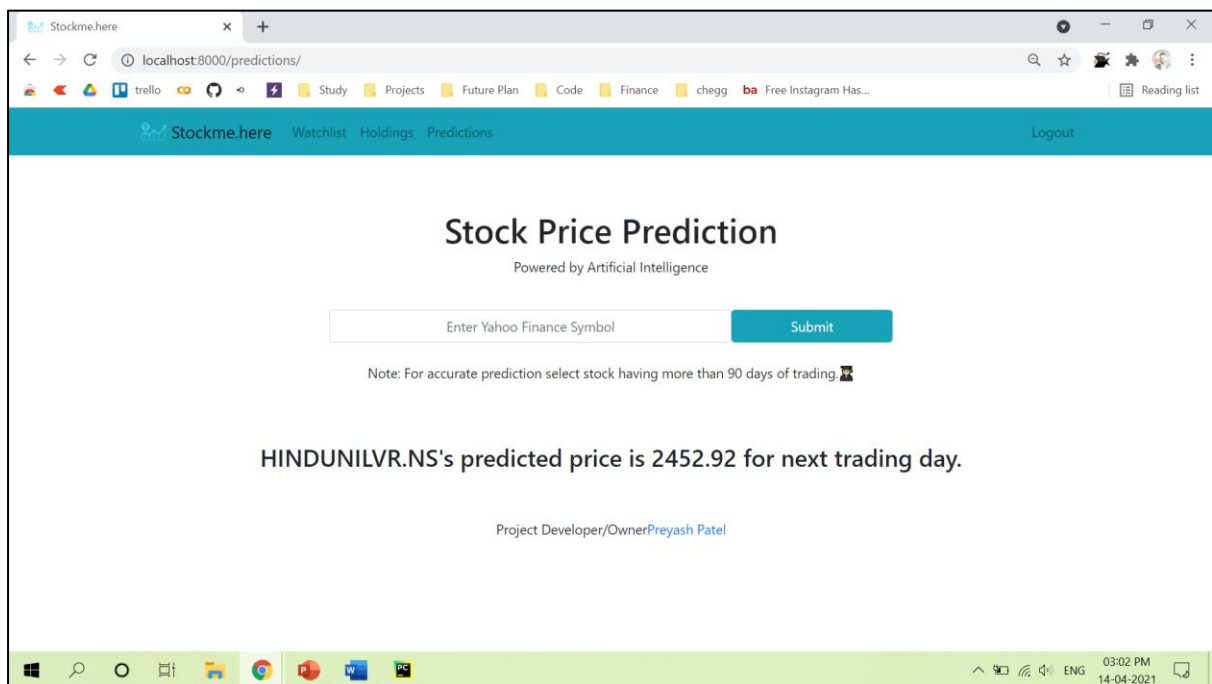
Admin Login Page
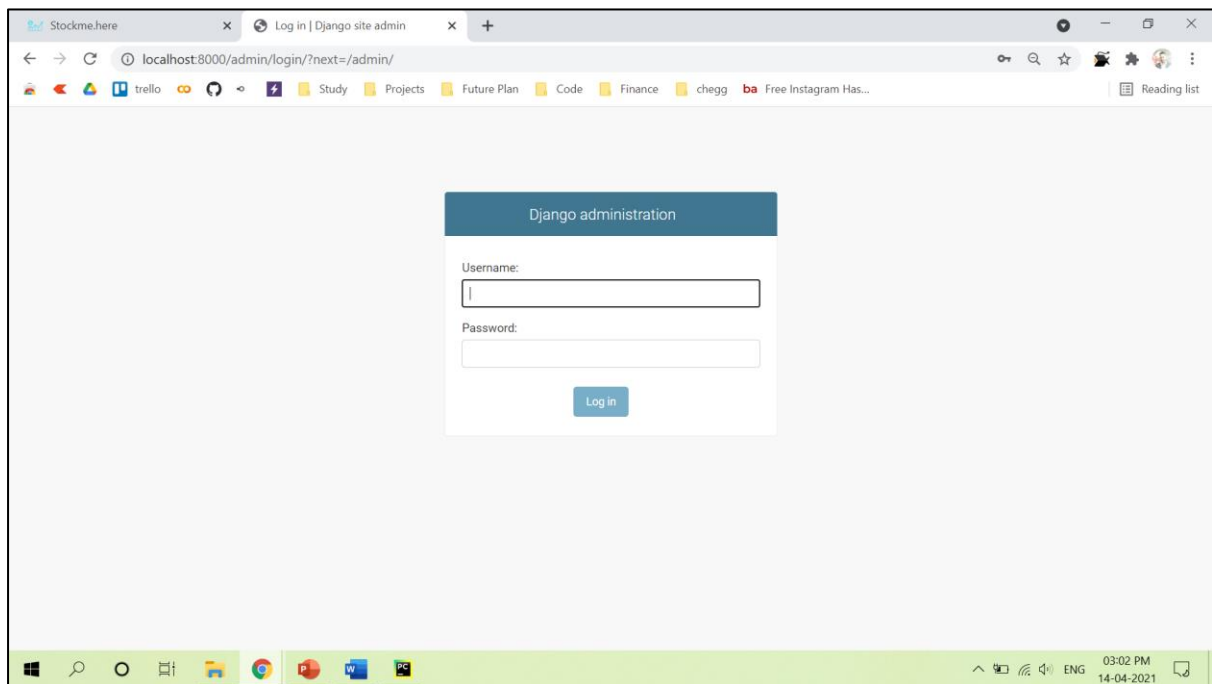
Admin Login Credential Validation:
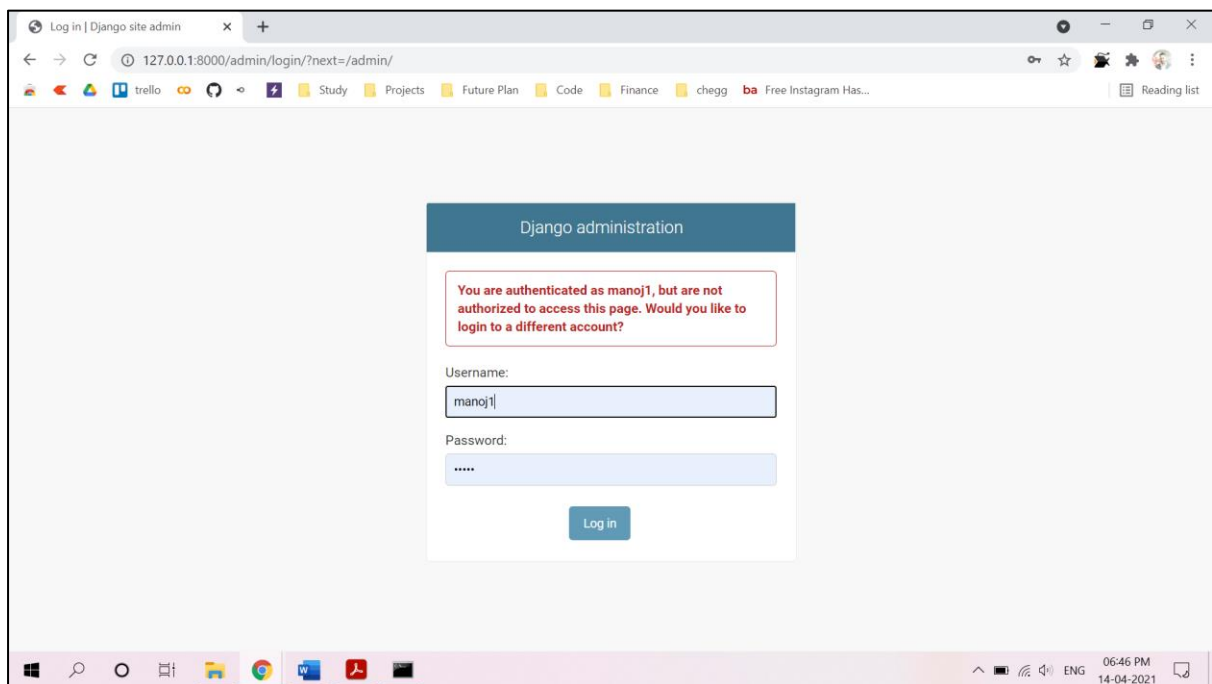
Admin Home Page
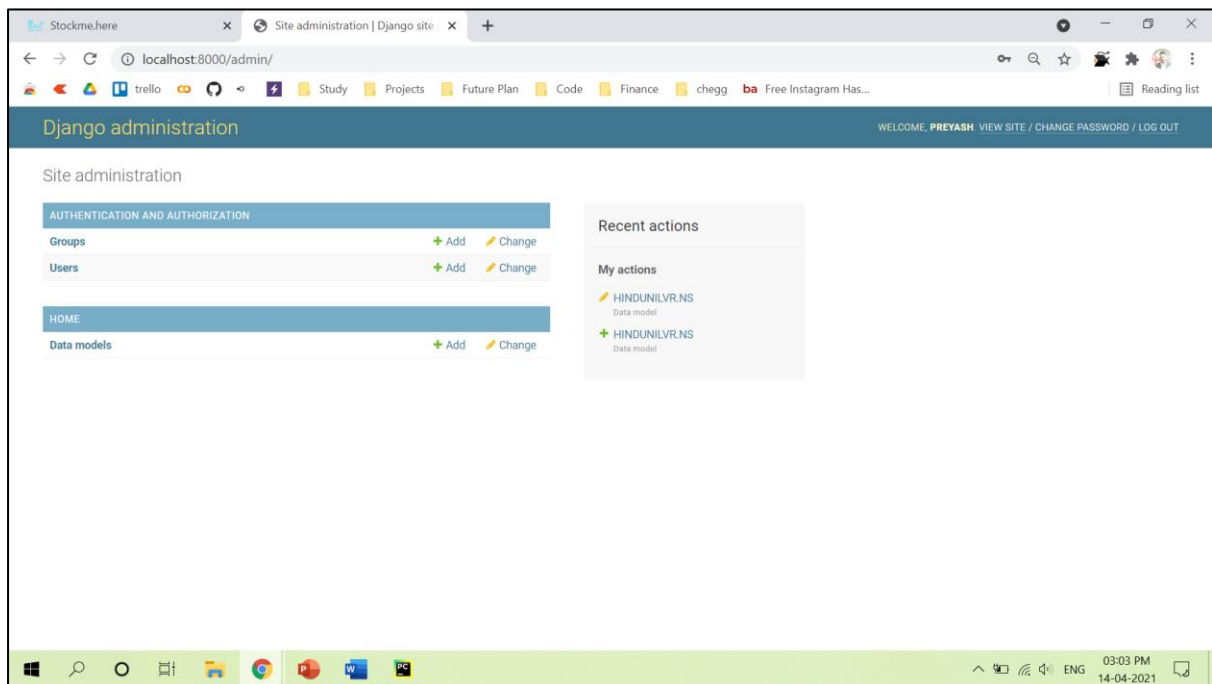
Admin User's List
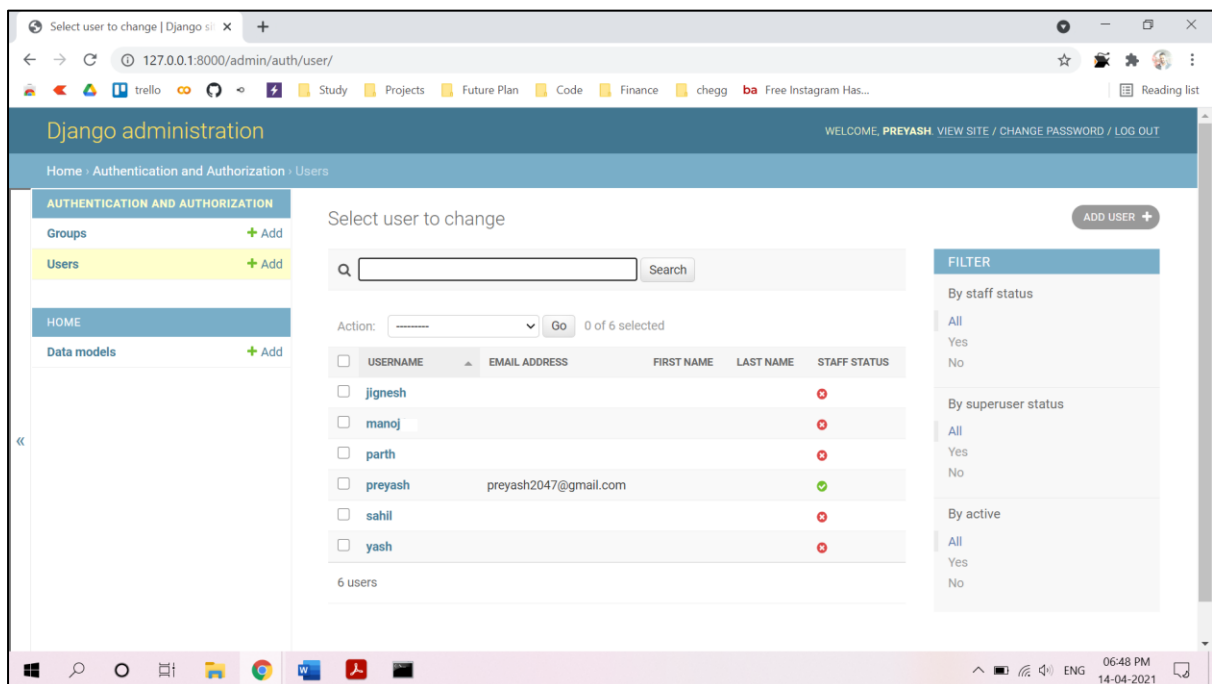
Admin Add User/Super User Page

Admin DataModel Page

Admin Add DataModel Page

Admin Change Password Page

Admin Logout Page

9.   Testing

Testing For Login/Signup Validation

Sr.No	Validation Checking	Excepted Result	Test Result
1	Usename	Not Null and Unique	Pass
2	Password	Not null	Pass
3	Confirm Password	Not null	Pass

Testing For Watchlist

Sr.No	Validation Checking	Excepted Result	Test Result
1	Symbol	As per Yahoo Finance	Pass

Testing For Holding

Sr.No	Validation Checking	Excepted Result	Test Result
1	Symbol	As per Yahoo Finance	Pass
2	Quantity	Greater then Zero	Pass

Testing For Prediction

Sr.No	Validation Checking	Excepted Result	Test Result
1	Symbol	As per Yahoo Finance	Pass

10. Future Enhancement

- Implement NLTK to have impact of News on Stock Price Prediction

- Speeding up the Model training time

- Maintain prebuilt model for faster response

- News update for respective stock

- Stock's Fundamentals view

11.   Bibliography / References

Books References

- Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems

- Python Machine Learning

Web References

- https://www.djangoproject.com/

- https://in.finance.yahoo.com/

- https://www.python.org/

- http://tensorflow.org/

- http://keras.io/