

# Stock Price Prediction using Machine Learning



Submitted By : - M.C.A. (Regular Entry) Semester-VI

Preyash S. KaPatel (18034211003)

Guided by

Dr. Jigneshkumar A. Chauhan (Internal Guide)

Submitted to

Acharya Motibhai Patel Institute of Computer Studies,  
GANPAT UNIVERSITY

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# Project Profile

The background features a series of overlapping triangles and thin lines in various shades of orange and yellow, creating a dynamic, abstract geometric pattern on the right side of the slide.

# Project Profile

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

# Requirement Specification

# 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.
  - ▶ Taking the Stake sale/buy/Hold based on emotion and incomplete information may perform false prediction.
- 
- ▶ Drawback of Existing System
    - ▶ Incomplete Information
    - ▶ Emotion based Decision
    - ▶ Unawareness of stock price patterns

# Need for new system

- ▶ Rapid Decision:
  - ▶ User can take decision rapidly as it is performed autonomous.
- ▶ Improved Accuracy:
  - ▶ User can use the result to take decision for stake sale or hold or buy
- ▶ Based on Historic data:
  - ▶ Prediction are based on historic data and past events' effect.

# Machine Learning Algorithm

- ▶ Stock price prediction is an important decision in order to get 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 of 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.

# Machine Learning Algorithm

- ▶ 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)



# Machine Learning Algorithm

- ▶ 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)
  - ▶  $RSI = 100 - [100 / ( 1 + (\text{Average of Upward Price Change} / \text{Average of Downward Price Change} ) ) ]$

# Machine Learning Algorithm

- ▶ MFI (Money Flow Index):
  - ▶ Related to RSI but incorporates volume too where RSI considers prices only
    - ▶ Typical Price =  $(\text{High} + \text{Low} + \text{Close})/3$
  - ▶ 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

# Machine Learning Algorithm

- ▶ 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
  - ▶  $EMA = (K \times (C - P)) + P$
  - ▶ where,
    - ▶ C = Current Price
    - ▶ P = Previous periods EMA (A SMA is used for the first periods calculations)
    - ▶ K = Exponential smoothing constant

# USED HARDWARE AND SOFTWARE CLINET SIDE

- ▶ Minimum Requirement of Hardware and Software:
- ▶ Hardware Requirement:
  - ▶ Basic CPU with 700 MHz Speed
  - ▶ 1 GB RAM
- ▶ Software Requirement:
  - ▶ Chrome with 68.0.3440.75 or above Version
  - ▶ Good Internet Speed

# USED HARDWARE AND SOFTWARE

## Server SIDE

- ▶ Minimum Requirement of Hardware and Software:
- ▶ Hardware Requirement:
  - ▶ Inter i3 10th generation
  - ▶ 4 GB RAM
  - ▶ 250 mb Space in SSD
- ▶ Software Requirement:
  - ▶ Chrome with 68.0.3440.75 or above Version
  - ▶ High Speed Internet
  - ▶ Google Colab
  - ▶ Webpage IDE
  - ▶ Github Desktop

# FUNCTIONAL MODULE SPECIFICATION

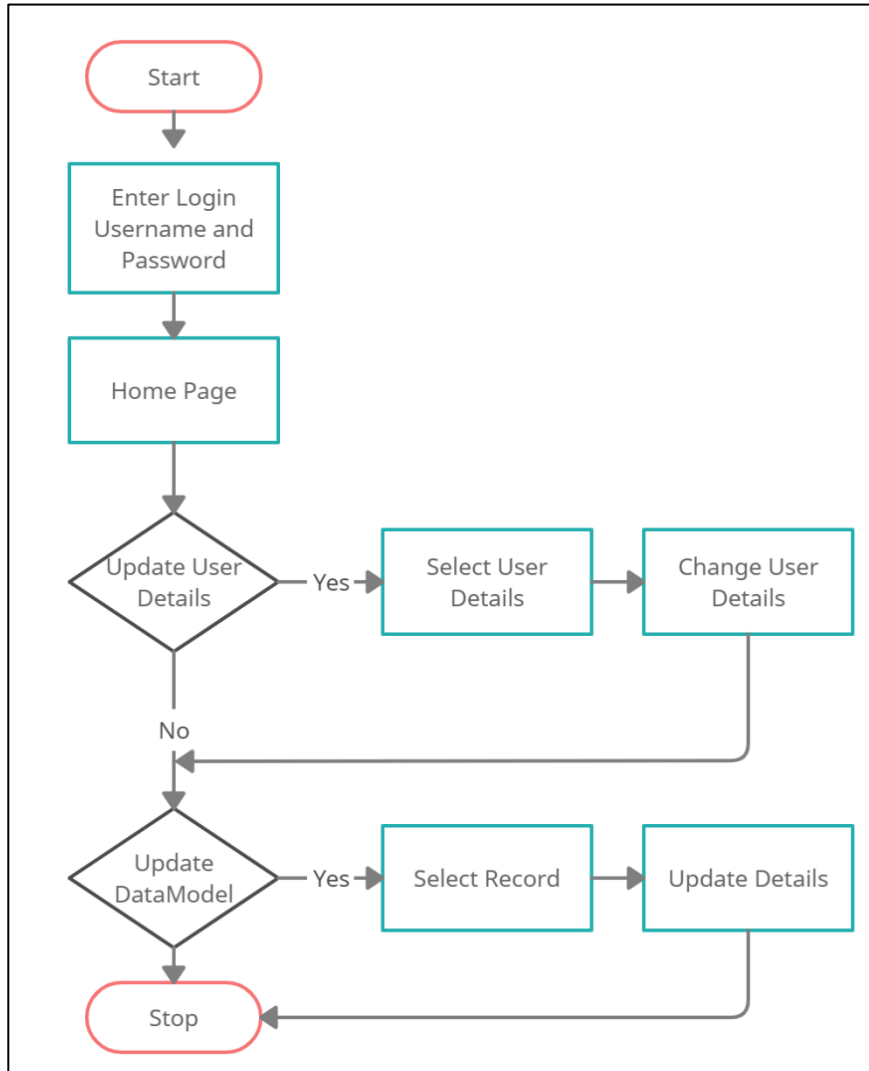
# Functional Module Specification

- ▶ Login:
  - ▶ Admin and Account Holder can access website by successfully login
- ▶ Watchlist:
  - ▶ User can add remove stock from watchlist.
- ▶ Holdings:
  - ▶ Here user can see there stock holding if they have.
- ▶ Predictions:
  - ▶ In this module user can predict the stock price.

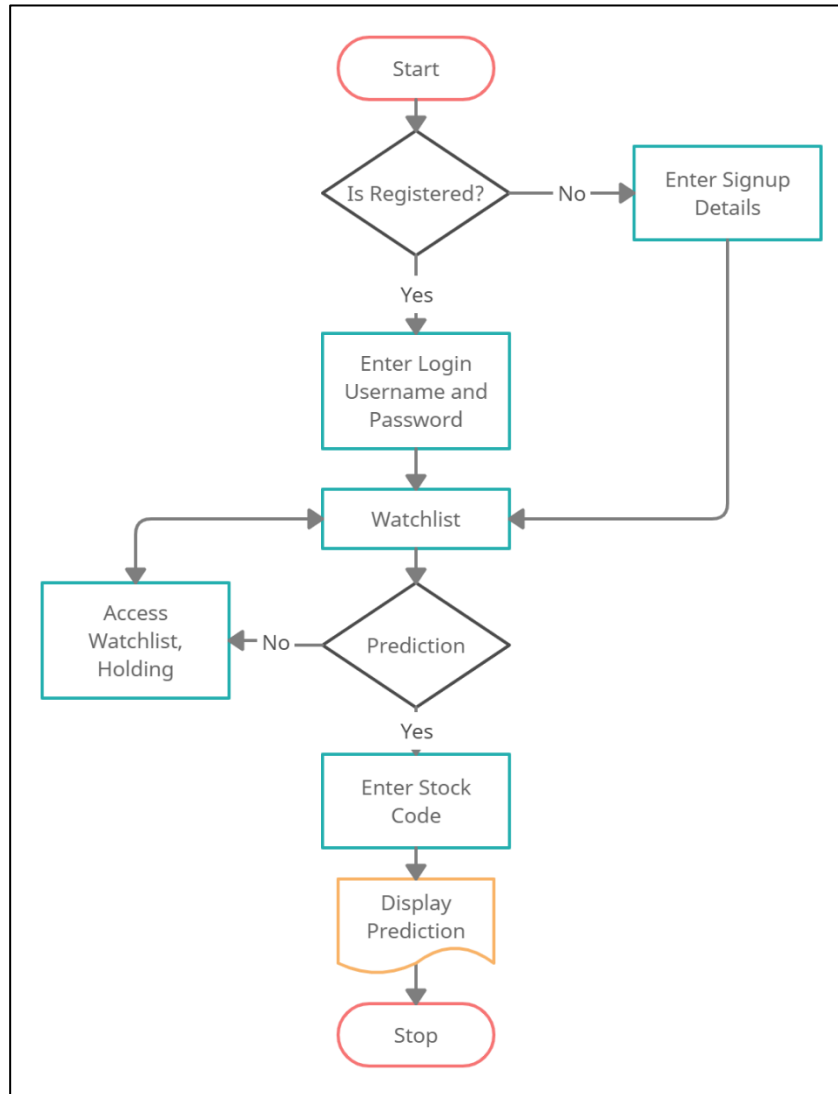
# SYSTEM FLOW CHART



# SYSTEM FLOW CHART for Admin



# SYSTEM FLOW CHART for User



# Use-Case Diagram



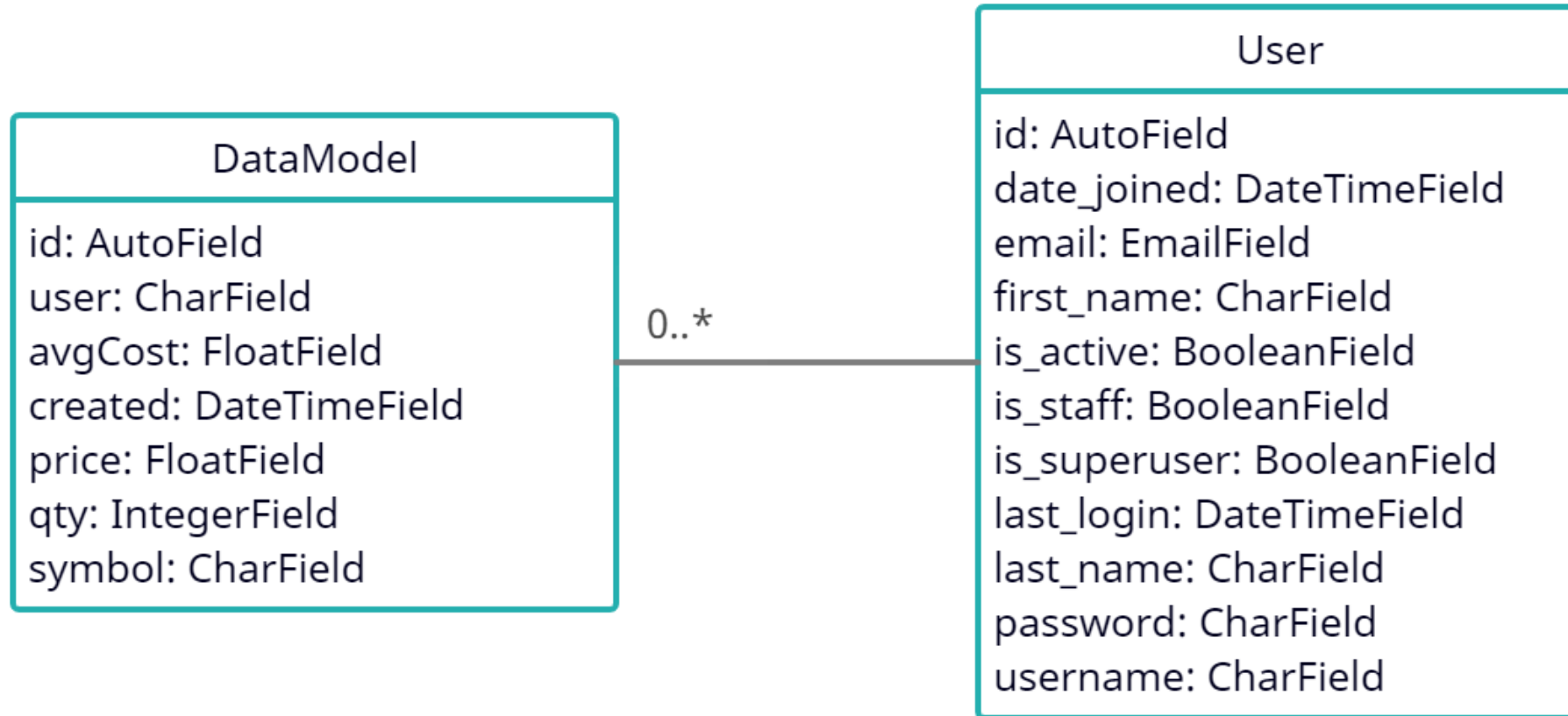
# Use-Case Diagram



# Class Diagram

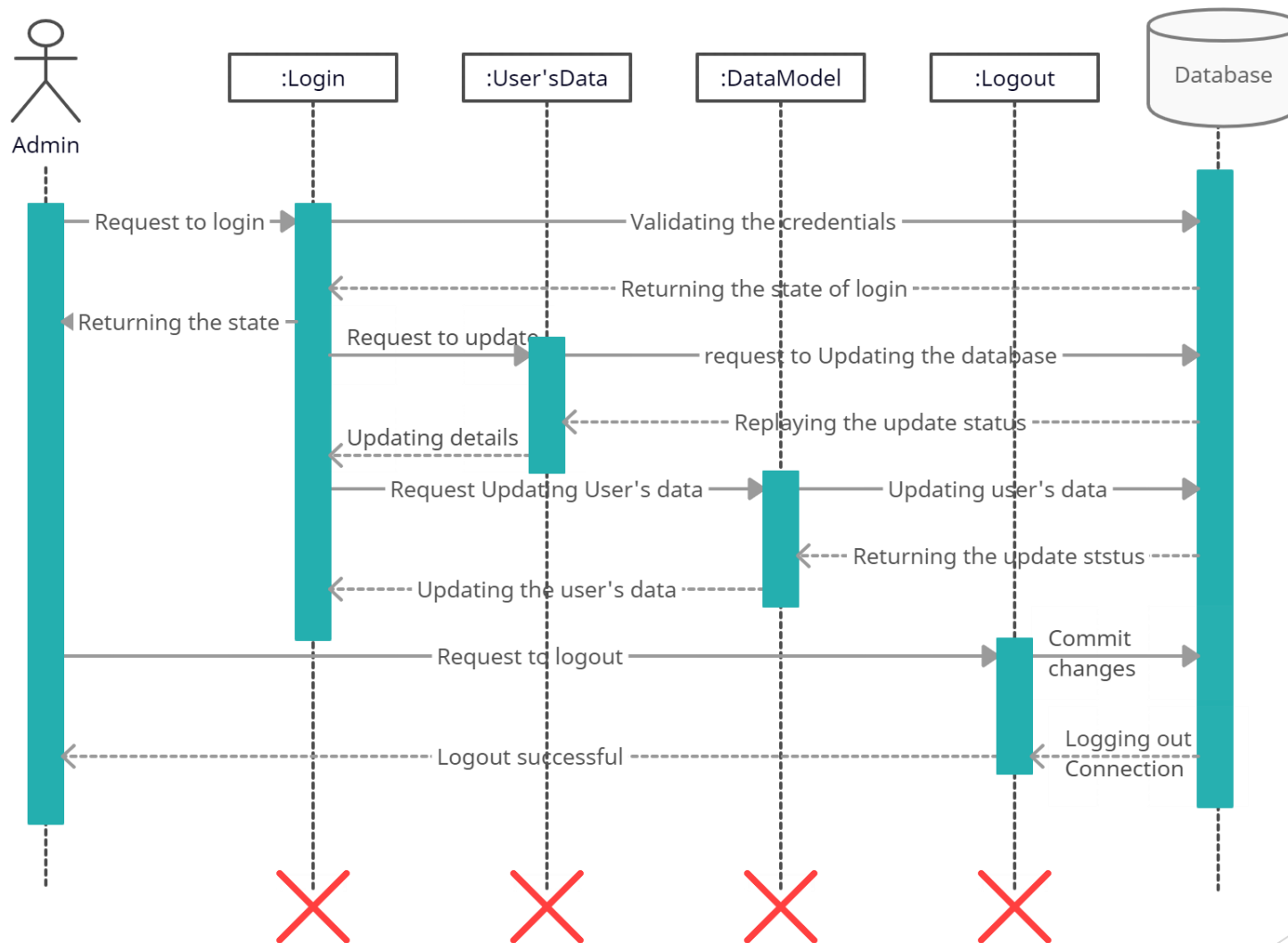


# Class Diagram



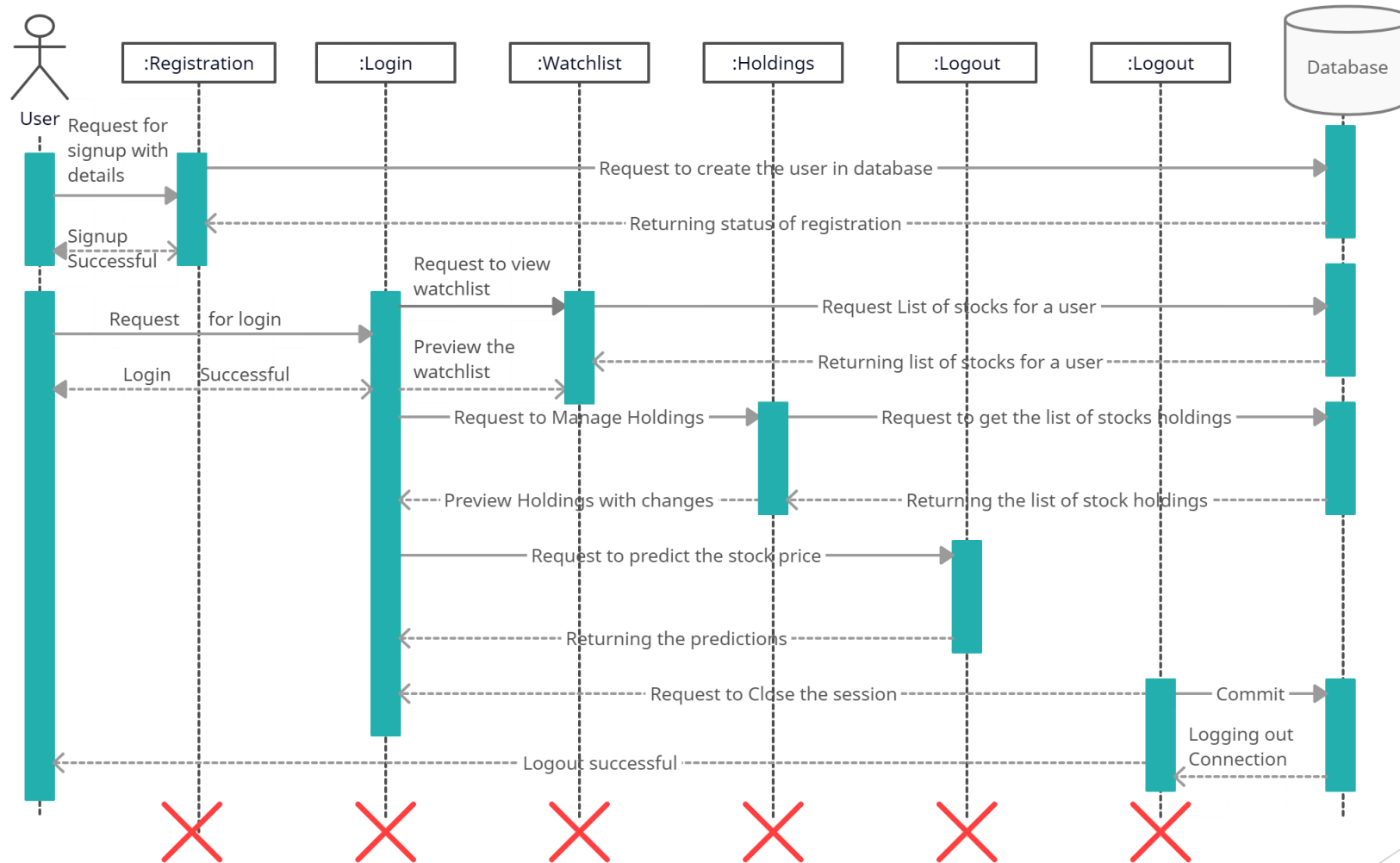
# Sequence Diagram

# Sequence Diagram for Admin





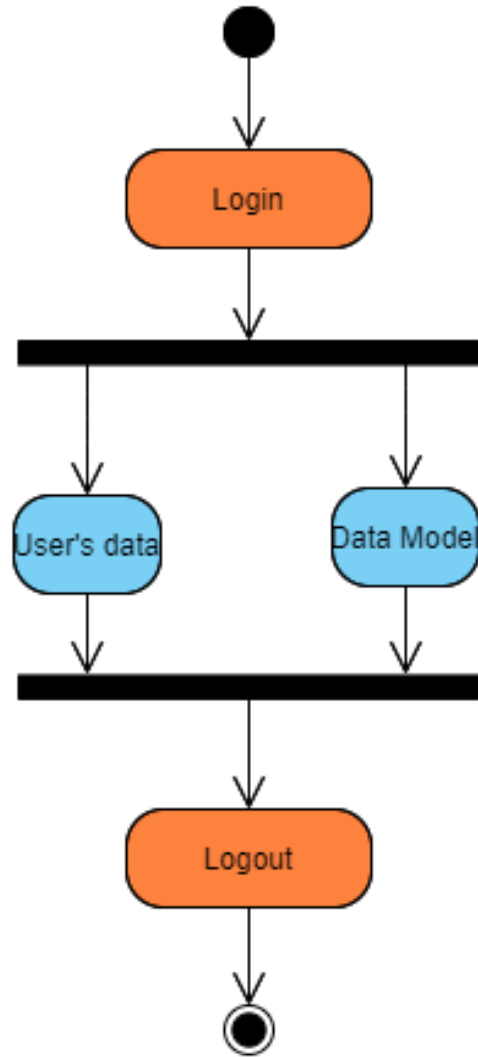
# Sequence Diagram for User



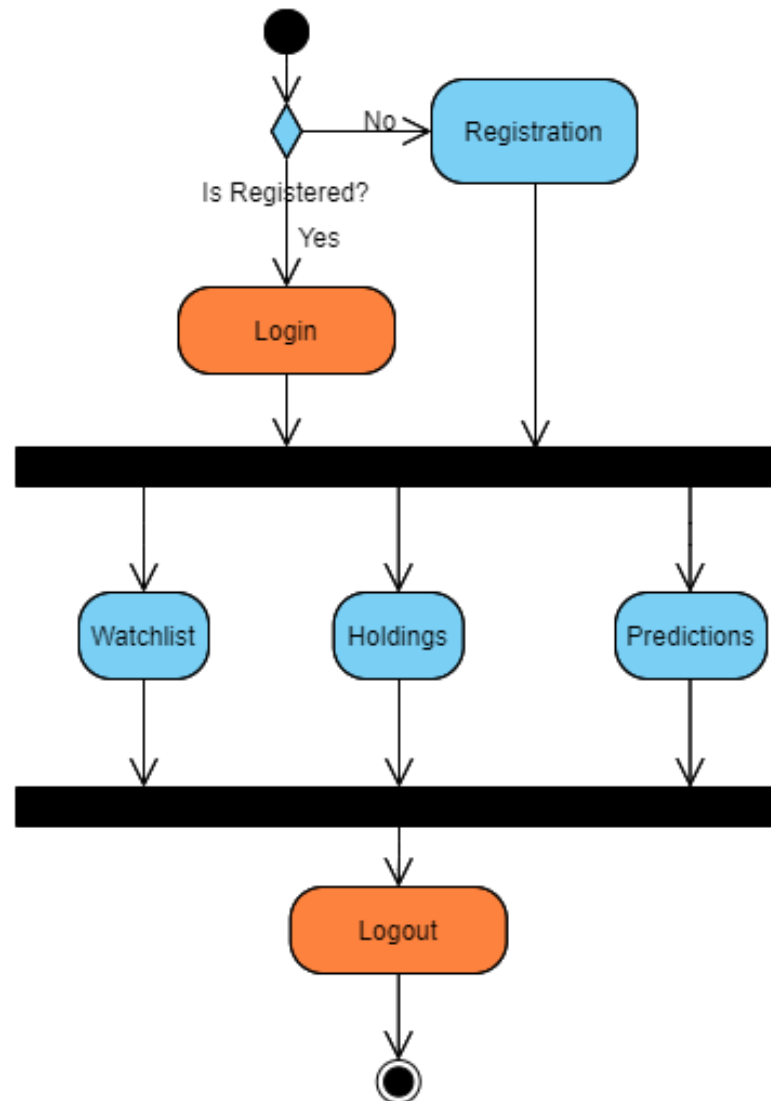
# Activity Diagram



# Activity Diagram for Admin



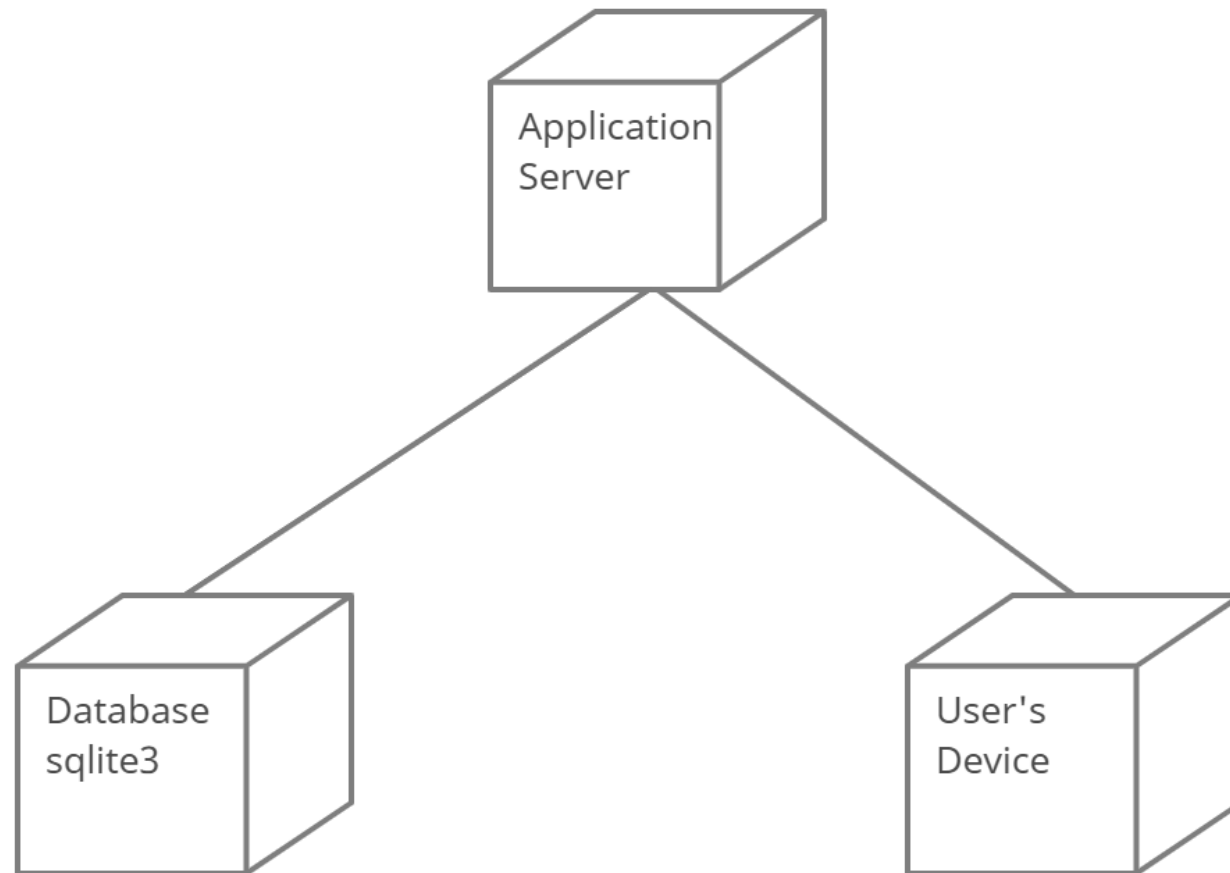
# Activity Diagram for User



# Deployment Diagram

The background of the slide features abstract, overlapping geometric shapes in various shades of orange and yellow, creating a modern, layered effect on the right side.

# Deployment Diagram



# Data Dictionary

# Data Dictionary

**Name: DataModel**

**DESCRIPTION :-** Represents stock holding and watchlist

Primary Key: id

<u>Sr.No</u>	<u>Field Name</u>	<u>Data Type</u>	<u>Constraint</u>	<u>Description</u>
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



# Data Dictionary

**Name:** User

**DESCRIPTION :-** Represents users's details

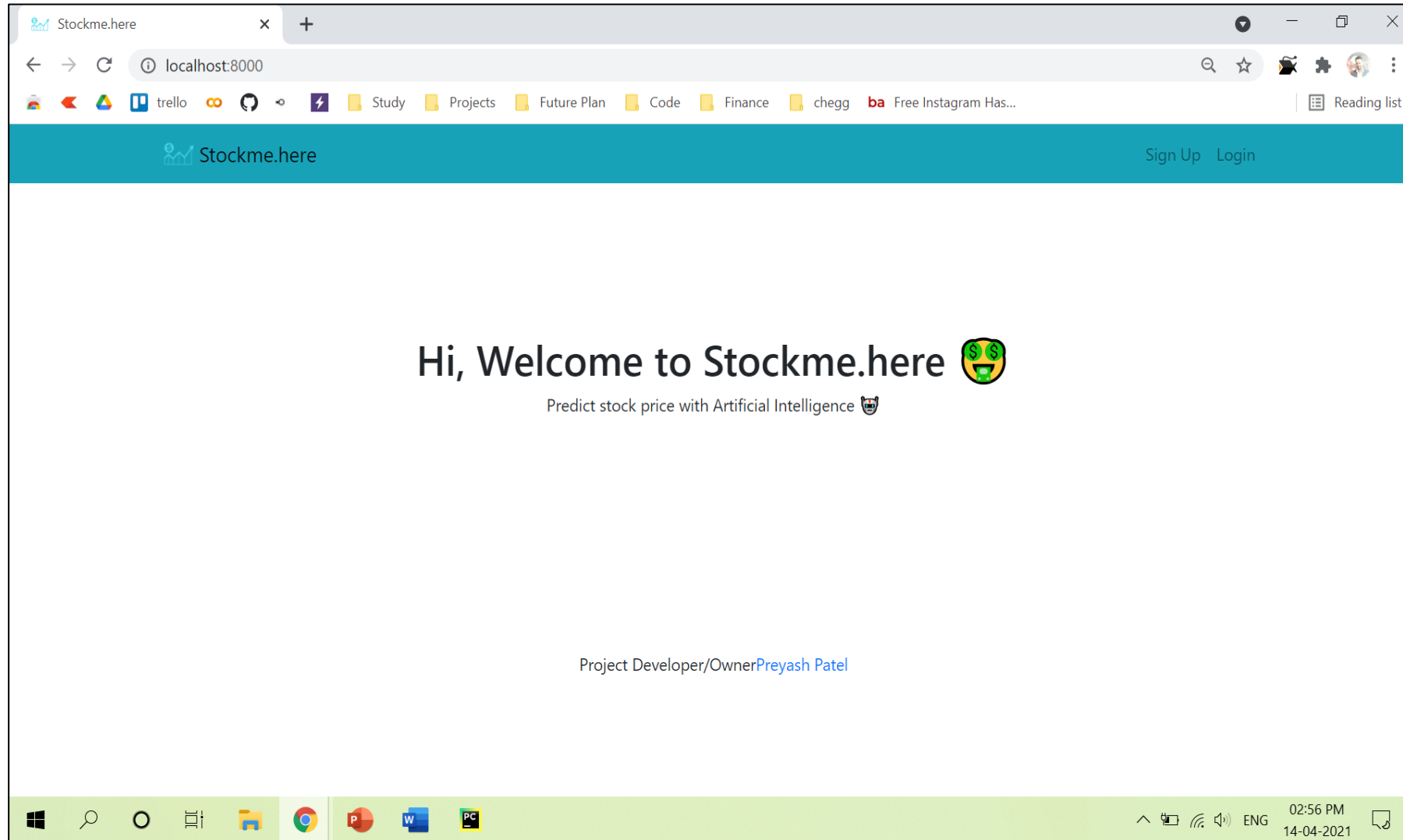
Primary Key: id

<u>Sr.No</u>	<u>Field Name</u>	<u>Data Type</u>	<u>Constraint</u>	<u>Description</u>
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

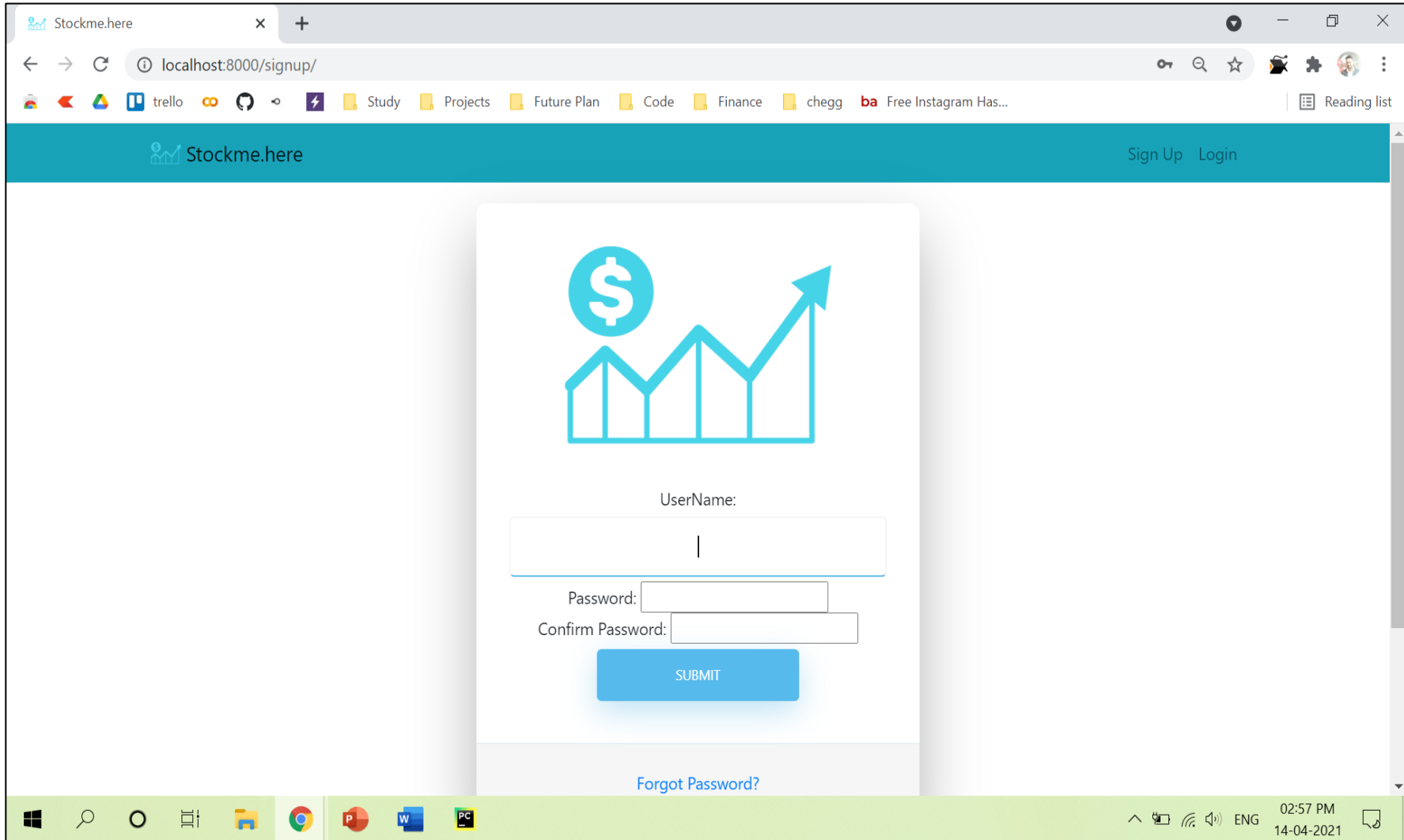
# Input & Output Design

The background features a series of overlapping triangles and thin lines in shades of orange and yellow, primarily concentrated on the right side of the slide. The text 'Input & Output Design' is positioned on the left side in a bold, orange, sans-serif font.

# Home Page




# Signup Page



The screenshot shows a web browser window with the address bar displaying 'localhost:8000/signup/'. The page has a teal header with the 'Stockme.here' logo and 'Sign Up' and 'Login' links. The main content area features a light gray box with a blue line graph icon containing a dollar sign. Below the icon are input fields for 'UserName:', 'Password:', and 'Confirm Password:', followed by a blue 'SUBMIT' button. A 'Forgot Password?' link is at the bottom of the box. The browser's taskbar at the bottom shows various application icons and the system clock indicating 02:57 PM on 14-04-2021.

Stockme.here

Sign Up Login



UserName:

Password:

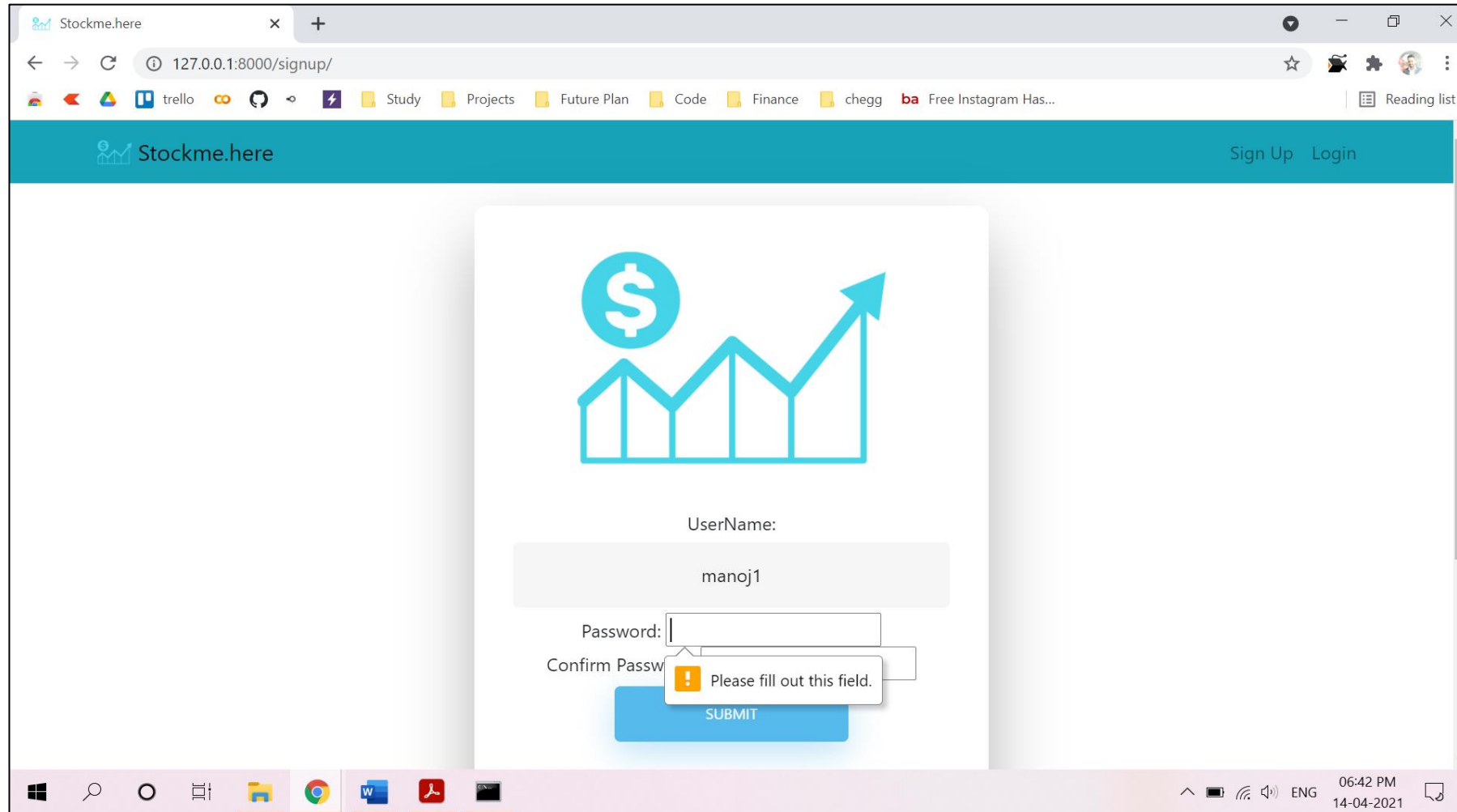
Confirm Password:

SUBMIT

[Forgot Password?](#)

02:57 PM  
14-04-2021

# Signup Credential Validation:



The screenshot shows a web browser window with the address bar displaying `127.0.0.1:8000/signup/`. The page title is "Stockme.here". The browser's address bar and tabs are visible at the top. The page has a teal header with the "Stockme.here" logo and "Sign Up" and "Login" links. The main content area features a white card with a blue line graph icon containing a dollar sign. Below the icon, the "UserName:" field is filled with "manoj1". The "Password:" field is empty, and the "Confirm Password:" field is also empty. A blue "SUBMIT" button is at the bottom of the form. A validation error message, "Please fill out this field.", is displayed in a yellow box with an exclamation mark icon, pointing to the "Confirm Password:" field. The Windows taskbar is visible at the bottom of the screen, showing the time as 06:42 PM on 14-04-2021.

Stockme.here

Sign Up Login

UserName:

manoj1

Password:

Confirm Password:

! Please fill out this field.

SUBMIT

# Login Page

Stockme.here


localhost:8000/userlogin/

trellio

Study Projects Future Plan Code Finance chegg Free Instagram Has...

Reading list

Stockme.here Sign Up Login



Username:

Password:

SUBMIT

02:57 PM  
14-04-2021

# Login Credential Validation:

Stockme.here

127.0.0.1:8000/userlogin/

Stockme.here Sign Up Login

Username:

manoj1

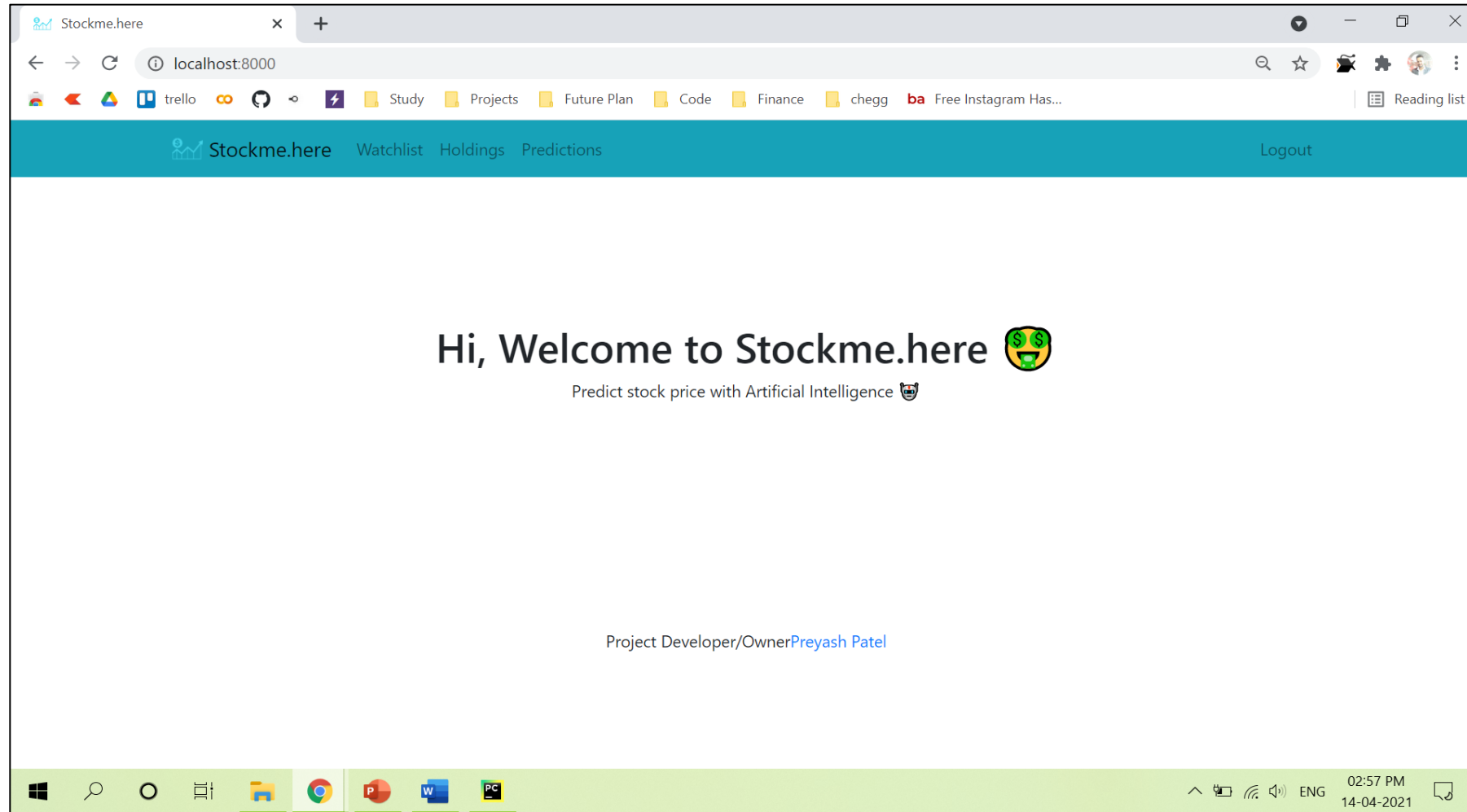
Password:

Please fill out this field.

Please fill out this field.

06:44 PM 14-04-2021

# Home after login





# Watchlist Page

The screenshot shows a web browser window with the address bar at `localhost:8000/watchlist/`. The page has a teal header with the logo 'Stockme.here' and navigation links: 'Watchlist', 'Holdings', 'Predictions', and a 'Logout' button. The main content area is titled 'Watchlist' and contains a form with a text input 'Enter Finance Symbol ending with .BSE' and a 'Submit' button. Below the form are two buttons: 'Update Price' and 'Buy/Sell'. A table below these buttons lists two stocks:

HINDUNILVR.NS	2393.15	Remove
GOOG	2267.27	Remove

The Windows taskbar at the bottom shows the time as 02:59 PM on 14-04-2021, with system icons for network, volume, and language (ENG).

# Holdings Page

Stockme.here Watchlist Holdings Predictions Logout

## Holdings

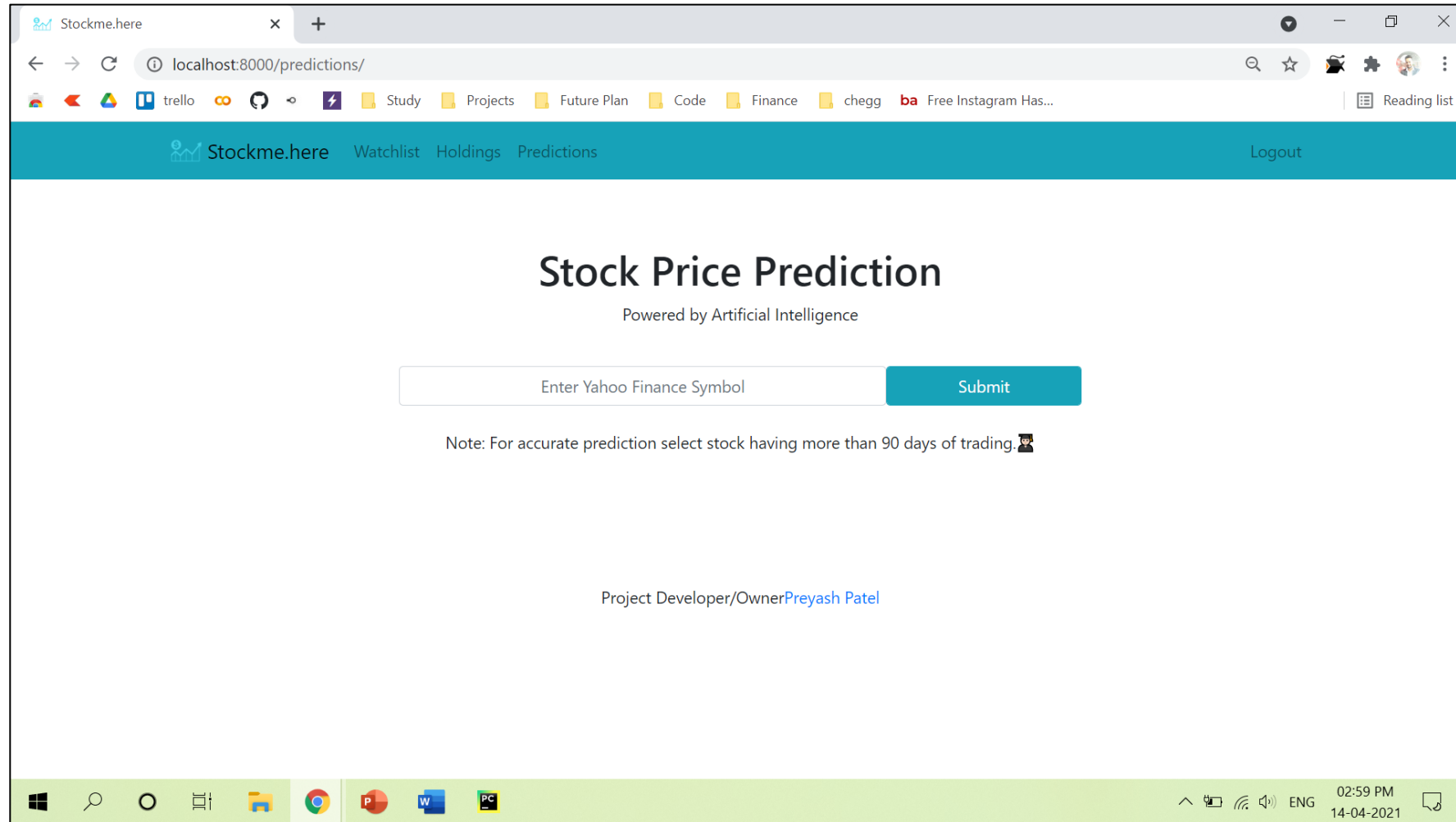
Enter Finance Symbol ending with .BSE

HINDUNILVR.NS	LTP: 2393.15	Cost: 0.0	Quantity: 1
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Project Developer/Owner [Preyash Patel](#)

02:59 PM 14-04-2021

# Prediction Page



# Prediction Page

Stockme.here Watchlist Holdings Predictions Logout

## Stock Price Prediction

Powered by Artificial Intelligence

Enter Yahoo Finance Symbol

Note: For accurate prediction select stock having more than 90 days of trading.

**HINDUNILVR.NS's predicted price is 2452.92 for next trading day.**

Project Developer/Owner [Preyash Patel](#)

03:02 PM  
14-04-2021

# Admin Login Page

Stockme.here x Log in | Django site admin x +

localhost:8000/admin/login/?next=/admin/

Reading list

Django administration

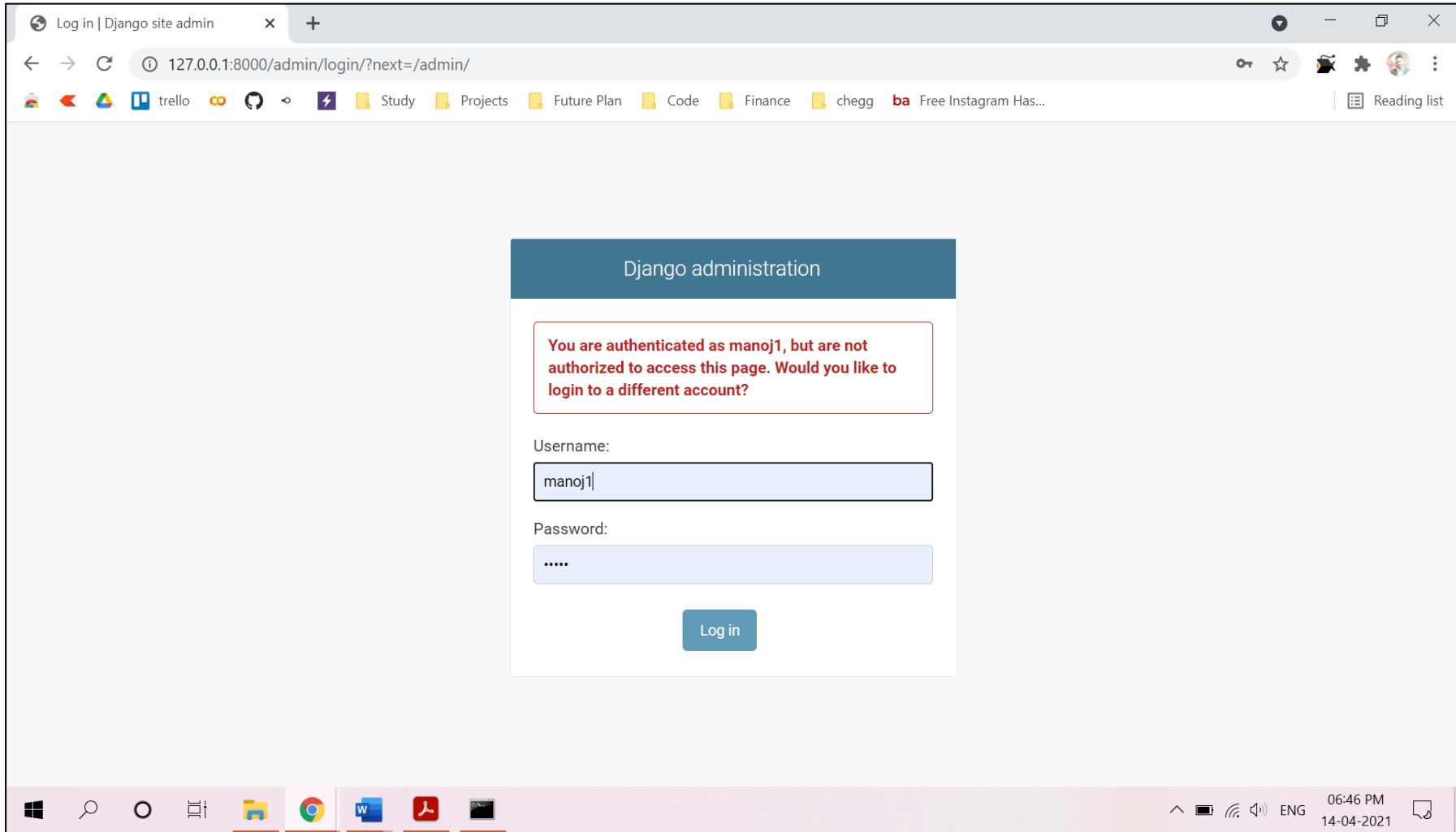
Username:

Password:

Log in

03:02 PM  
14-04-2021

# Admin Login Credential Validation:



The screenshot shows a web browser window with the title "Log in | Django site admin". The address bar displays the URL "127.0.0.1:8000/admin/login/?next=/admin/". The browser's tab bar shows several open tabs, including "trello", "Study", "Projects", "Future Plan", "Code", "Finance", "chegg", and "Free Instagram Has...". The main content area of the browser displays the Django administration login page. At the top of this page is a dark blue header with the text "Django administration". Below the header is a white box containing a red-bordered message: "You are authenticated as manoj1, but are not authorized to access this page. Would you like to login to a different account?". Underneath this message are two input fields: "Username:" with the text "manoj1" entered, and "Password:" with masked characters ".....". A blue "Log in" button is positioned below the password field. The Windows taskbar is visible at the bottom of the screen, showing various application icons and the system clock indicating 06:46 PM on 14-04-2021.

Log in | Django site admin

127.0.0.1:8000/admin/login/?next=/admin/

trello Study Projects Future Plan Code Finance chegg Free Instagram Has...

Django administration

You are authenticated as manoj1, but are not authorized to access this page. Would you like to login to a different account?

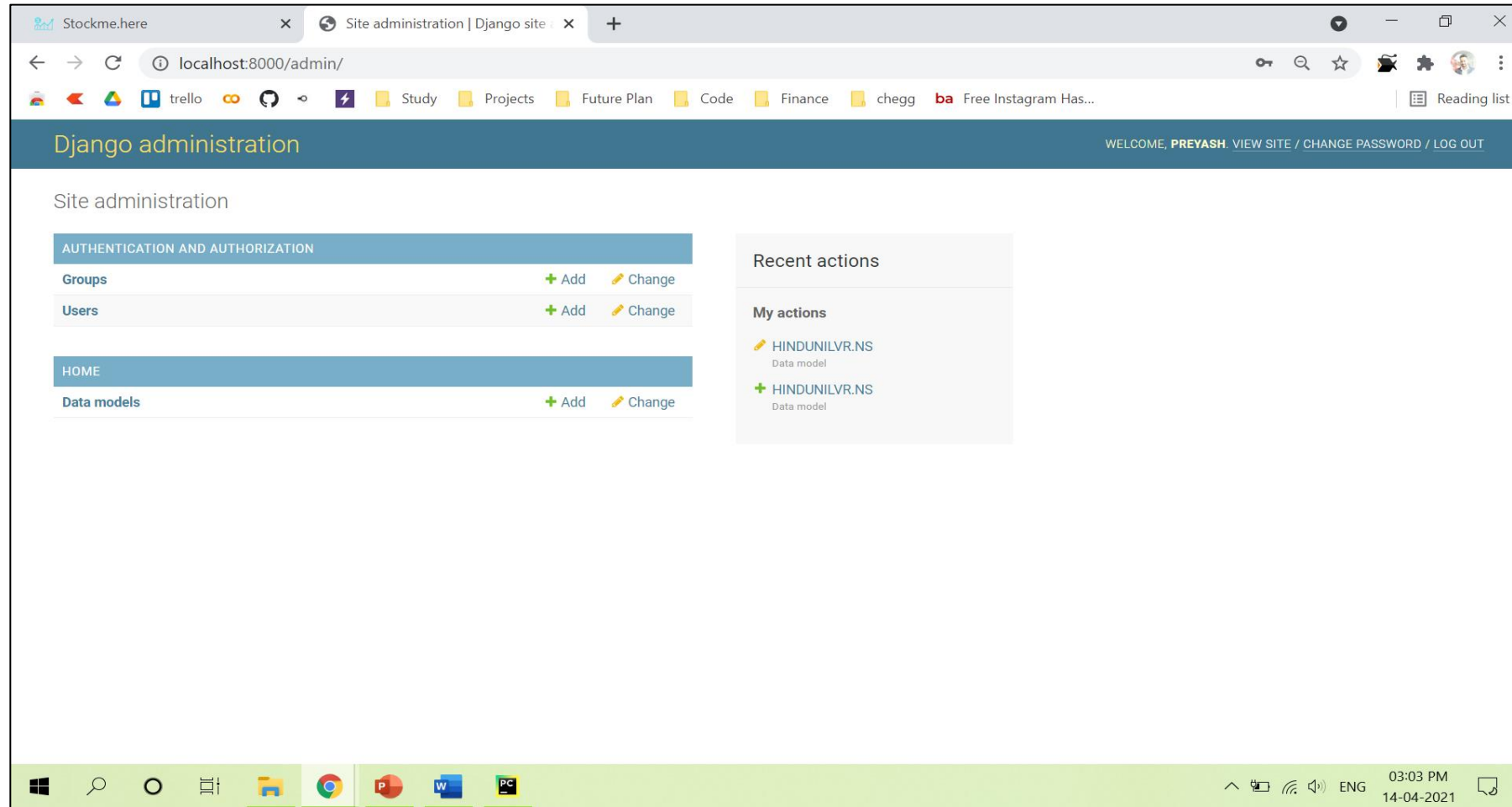
Username:  
manoj1

Password:  
.....

Log in

06:46 PM  
14-04-2021

# Admin Home Page



# Admin User's List

Select user to change | Django site

127.0.0.1:8000/admin/auth/user/

Django administration

WELCOME, PREYASH. [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Home > Authentication and Authorization > Users

**AUTHENTICATION AND AUTHORIZATION**

- Groups + Add
- Users + Add

**HOME**

- Data models + Add

Select user to change

ADD USER +

Search

Action: ----- Go 0 of 6 selected

<input type="checkbox"/>	USERNAME	EMAIL ADDRESS	FIRST NAME	LAST NAME	STAFF STATUS
<input type="checkbox"/>	jignesh				✗
<input type="checkbox"/>	manoj				✗
<input type="checkbox"/>	parth				✗
<input type="checkbox"/>	preyash	preyash2047@gmail.com			✓
<input type="checkbox"/>	sahil				✗
<input type="checkbox"/>	yash				✗

6 users

**FILTER**

By staff status

- All
- Yes
- No

By superuser status

- All
- Yes
- No

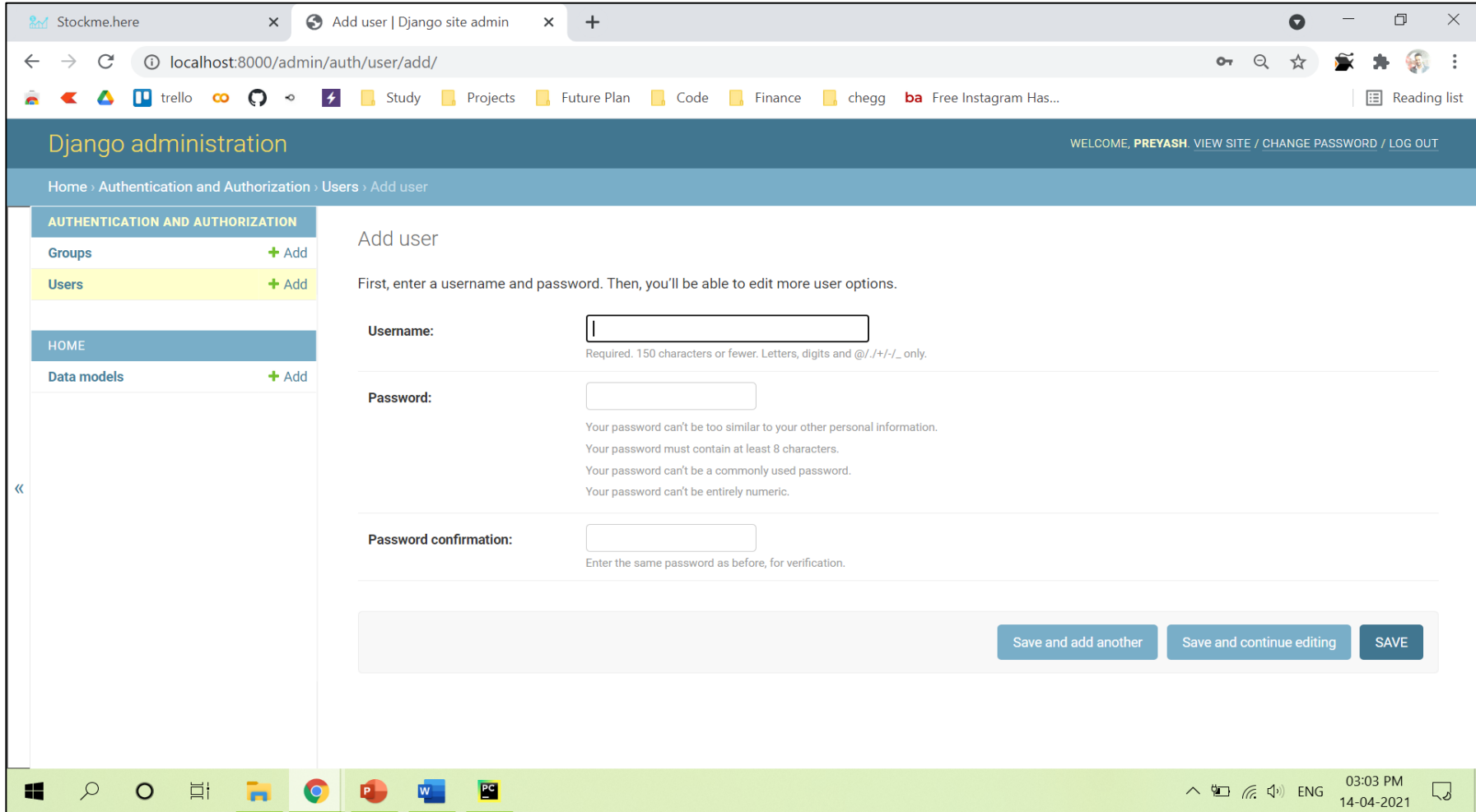
By active

- All
- Yes
- No

06:48 PM  
14-04-2021



# Admin Add User/Super User Page



Stockme.here x Add user | Django site admin x +

localhost:8000/admin/auth/user/add/

Django administration WELCOME, PREYASH. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Authentication and Authorization > Users > Add user

**AUTHENTICATION AND AUTHORIZATION**

- Groups + Add
- Users + Add**

**HOME**

- Data models + Add

«

## Add user

First, enter a username and password. Then, you'll be able to edit more user options.

**Username:**

Required. 150 characters or fewer. Letters, digits and @/./+/-/\_ only.

**Password:**

Your password can't be too similar to your other personal information.  
Your password must contain at least 8 characters.  
Your password can't be a commonly used password.  
Your password can't be entirely numeric.

**Password confirmation:**

Enter the same password as before, for verification.

Save and add another Save and continue editing SAVE

03:03 PM 14-04-2021

# Admin DataModel Page

The screenshot displays the Django administration interface for managing data models. The browser window shows the URL `localhost:8000/admin/home/datamodel/`. The Django header includes the title "Django administration" and a welcome message for "PREYASH" with links for "VIEW SITE", "CHANGE PASSWORD", and "LOG OUT".

The left sidebar contains navigation links for "AUTHENTICATION AND AUTHORIZATION" (Groups, Users) and "HOME" (Data models). The main content area is titled "Select data model to change" and features a table of data models with checkboxes for selection. An "Action:" dropdown and a "Go" button are located above the table. A button labeled "ADD DATA MODEL +" is positioned in the top right corner of the main area.

Action:	Go	0 of 15 selected
<input type="checkbox"/>	DATA MODEL	
<input type="checkbox"/>	GOOG	
<input type="checkbox"/>	GOOG	
<input type="checkbox"/>	HINDUNILVR.BSE	
<input type="checkbox"/>	IRFC.NS	
<input type="checkbox"/>	RELIANCE.NS	
<input type="checkbox"/>	RELIANCE.NS	
<input type="checkbox"/>	GOOG	
<input type="checkbox"/>	wipro.ns	
<input type="checkbox"/>	HINDUNILVR.NS	
<input type="checkbox"/>	HINDUNILVR.NS	
<input type="checkbox"/>	RELIANCE.NS	
<input type="checkbox"/>	GOOG	
<input type="checkbox"/>	RELIANCE.NS	

The Windows taskbar at the bottom shows the system clock as 03:03 PM on 14-04-2021, along with icons for network, volume, and other background applications.

# Admin Add DataModel Page

Stockme.here x Add data model | Django site ad x +

localhost:8000/admin/home/datamodel/add/

Django administration WELCOME, PREYASH. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home > Home > Data models > Add data model

**AUTHENTICATION AND AUTHORIZATION**

- Groups + Add
- Users + Add

**HOME**

- Data models + Add

«



### Add data model

Symbol:

Qty:

AvgCost:

Price:

User:   

Created: -

Windows taskbar: 03:03 PM 14-04-2021

# Admin Change Password Page

Stockme.here Password change

localhost:8000/admin/password\_change/

Django administration WELCOME, PREYASH. CHANGE PASSWORD / LOG OUT

Home > Password change

**AUTHENTICATION AND AUTHORIZATION**

- Groups + Add
- Users + Add

**HOME**

- Data models + Add

«

## Password change

Please enter your old password, for security's sake, and then enter your new password twice so we can verify you typed it in correctly.

Old password:

New password:

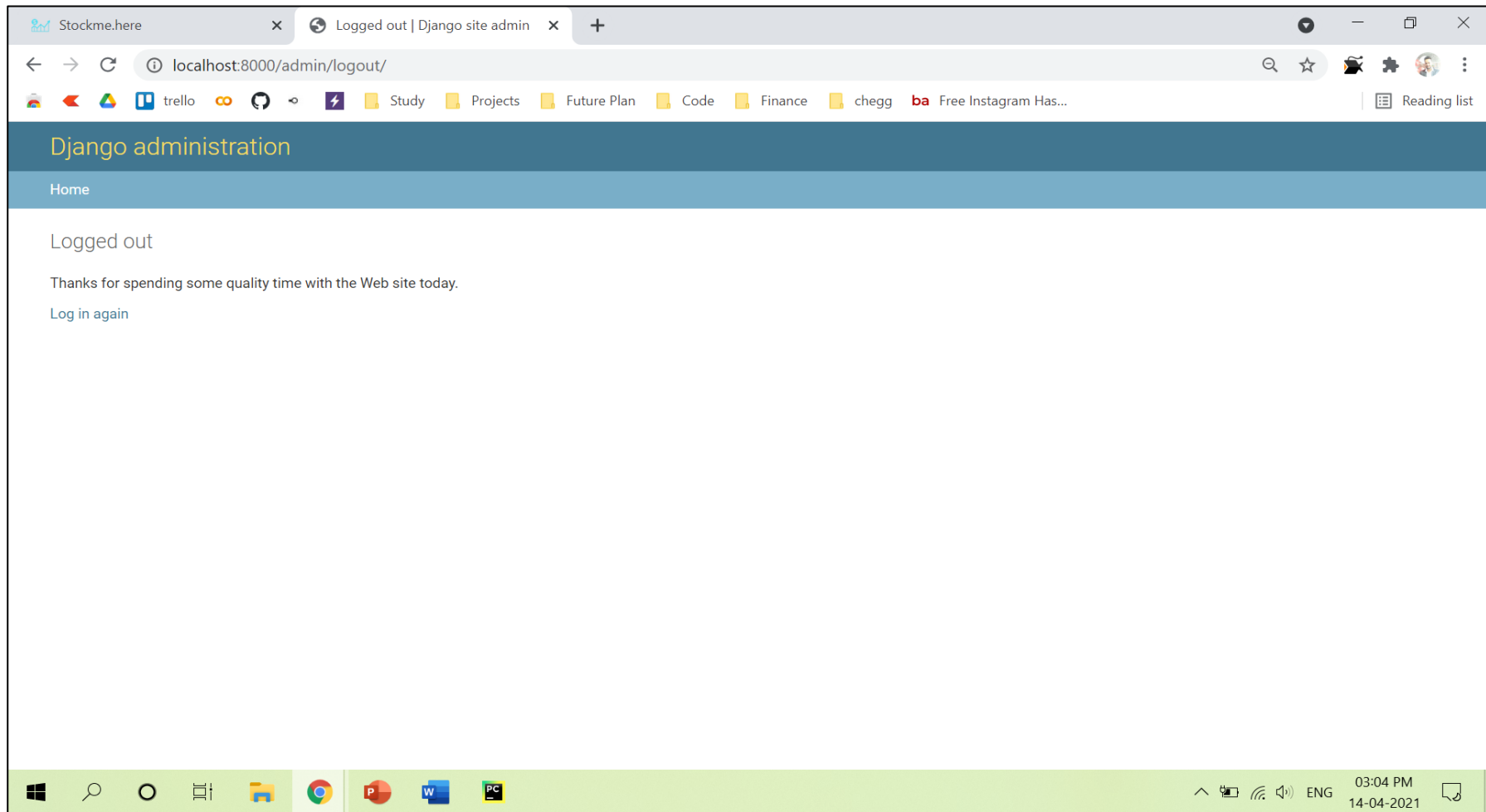
Your password can't be too similar to your other personal information.  
Your password must contain at least 8 characters.  
Your password can't be a commonly used password.  
Your password can't be entirely numeric.

New password confirmation:

CHANGE MY PASSWORD

03:04 PM 14-04-2021

# Admin Logout Page



# Testing

# Testing For Login/Signup Validation

---

<u>Sr.No</u>	<u>Validation Checking</u>	<u>Excepted Result</u>	<u>Test Result</u>
1	Username	Not Null and Unique	Pass
2	Password	Not null	Pass
3	Confirm Password	Not null	Pass

---

# Testing For Watchlist

---

<u>Sr.No</u>	<u>Validation Checking</u>	<u>Excepted Result</u>	<u>Test Result</u>
1	Symbol	As per Yahoo Finance	Pass

---



# Testing For Holding

---

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

---

# Testing For Prediction

---

<u>Sr.No</u>	<u>Validation Checking</u>	<u>Excepted Result</u>	<u>Test Result</u>
1	Symbol	As per Yahoo Finance	Pass

---

Future Enhancement

# 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

# Bibliography



# Bibliography

- ▶ <https://www.djangoproject.com/>
- ▶ <https://in.finance.yahoo.com/>
- ▶ <https://www.python.org/>
- ▶ <http://tensorflow.org/>
- ▶ <http://keras.io/>

Thank You