Software Requirements Specification

for

Weathr

(Weather Forecasting App)

Submitted By

Arshdeep Singh – 19070122030

Dhruval Dangar – 19070122048

Project Report Written under the Guidance of

PROF. RHYTHM BHATIA

SYMBIOSIS INSTITUTE OF TECHNOLOGY

(A CONSTITUTENT OF SYMBIOSIS INTERNATIONAL UNIVERSITY)

Pune – 412115

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INTRODUCTION

Purpose

The purpose of this project is to design and build a fully functional weather desktop application called **Weathr**. Weathr's primary objective is to provide weather forecast data to users based on their geographic location in a simple and intuitive manner.

Document Conventions

The format of this Software Requirement Specifications is simple. Bold face, underline and indentations are used on general topics and on specific points of interest. The rest of the document is written using the font, Calibri (Body).

Intended Audience & Reading Suggestions

• *Users* - It can be used by anyone who is looking to find out about the weather. The people who mainly use this service are people who are booking holidays to check the weather in a different country/city, or looking to go out.

• *Weather calls* - sends OpenWeatherMap API requests. Requests are used to update current weather or to get the projected forecast for a future date.

• *Graphic Depicting* - small icons that correspond to the weather. For instance, on sunny days, the app would display a small sun icon, on cloudy days, there will be a cloud etc.

Product Scope

Weathr's objective is to provide an easy and straightforward manner in which users can obtain weather forecasts for their city. New users will register accounts with the application, and the application's database will be able to support up to 100 user accounts.

The application's focus will be on users in India, although the weather service is open to users across the globe. The goal is to provide weather forecasts for every city within a country.

References

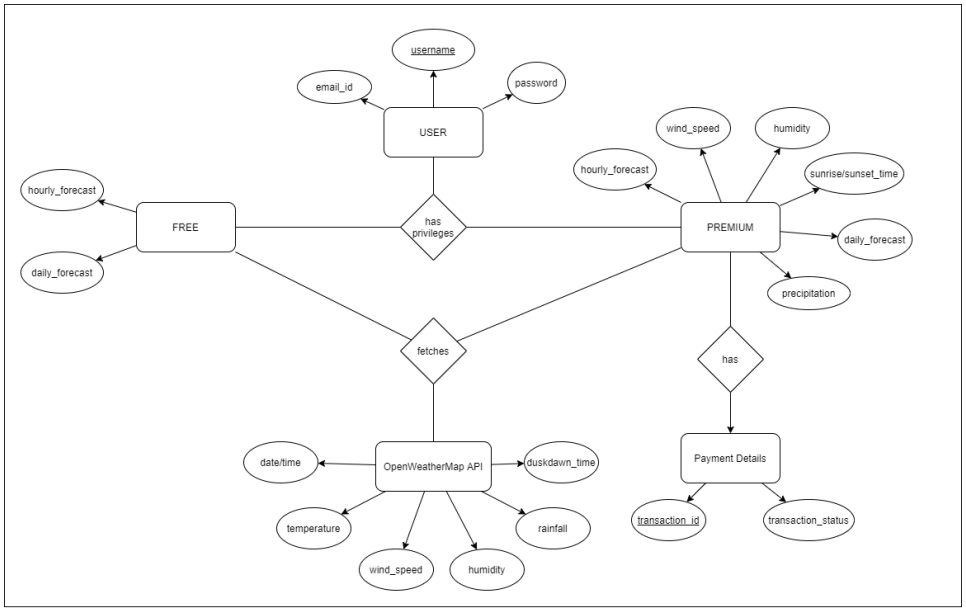
- OpenWeatherMap API (https://openweathermap.org/api)
- IEEE Guide for Developing System Requirements Specifications
- Sample SRS Format (Reference PDF)

OVERALL DESCRIPTION

Product Perspective

Using the Weathr App, users will be able to accomplish the following,

- Get weather forecasting information
- Meteorological information
- Share and display weather data
- Analyse weather forecasting



Product Functions

Weathr's main function is to show weather information for a given city in the World. Users can search by city names. The app can show the weather for the next few days. Users are able to search and get Weather Forecasts for the given city.

User Classes and Characteristics

The system will have User Authentication before Weather Services can be accessed.

The User should be able to perform the following functions:

- Login/Create an Account
- Search Weather for more than one City
- Share Weather data

There are no age or class restrictions on the application.

Operating Environment

Operating Environment for the Weathr App is as listed below,

- Hardware Environment: Desktop/Laptop Computers
- OS: Windows
- Platform: Java
- Database System: MySQL (JDBC)

Design and Implementation Constraints

Weathr is constrained by the OpenWeatherMap API as it allows the application to retrieve updated weather forecasts. Any changes to the OpenWeatherMap API will directly affect the capacity for Weathr to provide users with current forecasts.

For example, the OpenWeatherMap API currently allows **1,000 free calls** per day, so any increase or decrease in that amount would affect all users. If the OpenWeatherMap API was ever temporarily down or stopped functioning indefinitely, Weathr would not be able to retrieve weather updates during those instances.

The OpenWeatherMap API requires the use of an **internet connection**, making an internet connection a necessary element for Weathr to operate effectively. The speed and availability of a user's internet connection will affect how quickly the app is able to make a call to the OpenWeatherMap API.

Because Weathr is part of a semester mini-project by 2 students, that only offers limited time for the application to be completed. Due to the short time frame, number of developers, and experience of developers, Weathr will be restricted compared to weather applications currently in the market.

Assumptions and Dependencies

The OpenWeatherMap API will be a dependency for the project as Weathr will pull weather data using this API. Requirements relating to the number of API calls are based on the assumption that constraints around the OpenWeatherMap API will not change. If the OpenWeatherMap API changes their limitations on the number of calls that can be made each day, this could affect these requirements.

FUNCTIONAL REQUIREMENTS

1) New Accounts

Users that do not have an account will be directed to make an account for accessing Weather Services.

2) Sign-In Feature

Weathr will prompt registered users to sign in to access their accounts.

3) Sign Out and Switch Accounts Feature

Users can sign out of their accounts or switch accounts when using any feature of Weathr.

4) Total Call Numbers

Weathr will support up to 1000 calls per day. Total calls is the summation of all calls made by all accounts.

5) Search by City Name

When searching for a location to display its weather, the app allows users to search using city names. This will make it easy for most users to use the app quickly enough when looking for a desired location.

6) Multiple Locations

Users will be able to search Forecasts for Multiple Locations.

7) Advance Weather Prediction

While users can monitor the current weather, they will also have access to a 4-day in advance weather prediction for their searched cities.

NON-FUNCTIONAL REQUIREMENTS

Performance Requirements

- **Database Management Tools** will be used to maintain the application's database.
- **Application Loading Time** will be less than 10 seconds, 90% of the time.
- **Search Tool** will be evident, simple and easy to understand, in order for a user to perform a search easily.
- **System Dependability,** if the application loses the connection to the Internet, or the system gets some strange input, the user will be informed.

Safety Requirements

The application has no safety requirements as of now.

Security Requirements

Password Hashing,

User passwords will be hashed with a simple but well-designed key stretching algorithm before being stored in the application's database. This will reduce the likelihood of passwords being cracked and protect user data from security threats such as BF Attacks and dictionary attacks.

Software Quality Attributes

- **AVAILABILITY**: The weather data should be available on the specified date and specified time.
- **CORRECTNESS**: The weather data provided to the user should be accurate.
- **MAINTAINABILITY**: The application should be easy to maintain and support changes cost-effectively.
- **USABILITY**: The application should be user-friendly. It should be designed in such a way that after training, at least 90% of users should be able to successfully navigate and understand the application.

External Interface Requirements

Navigation via Buttons,

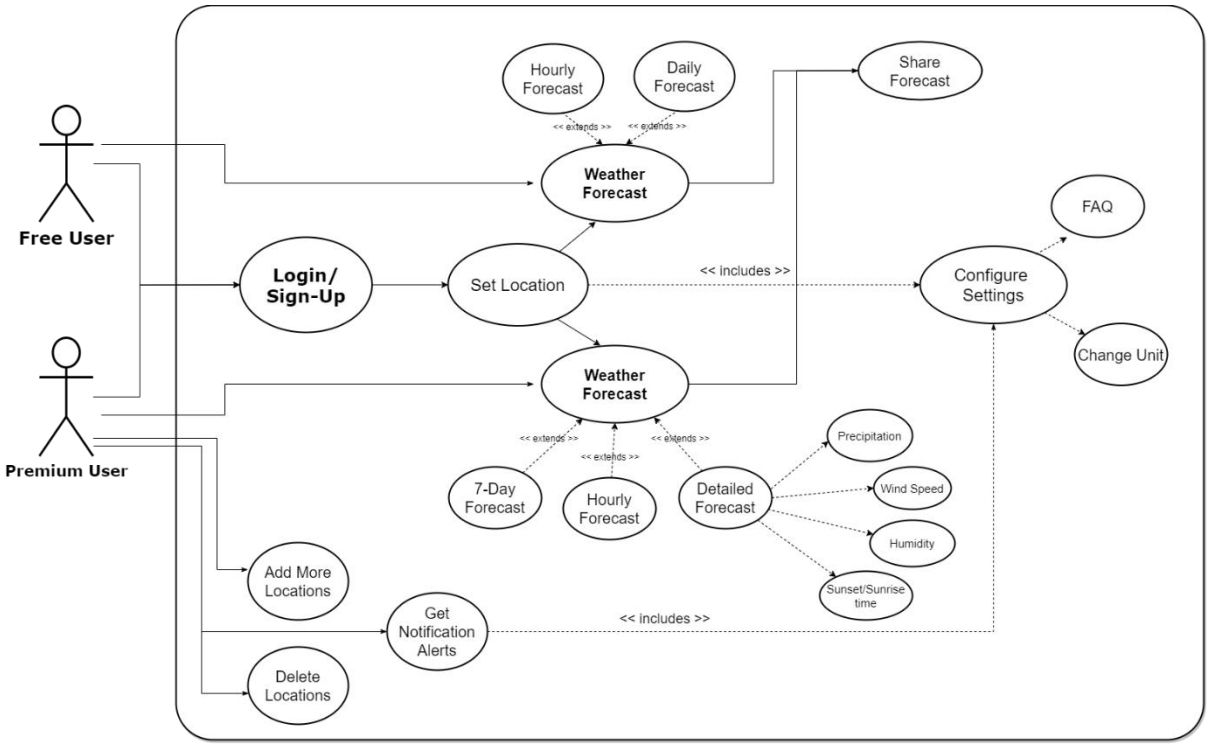
The application's current-day and 4-day weather displays will use a button design for navigation. The user will be able to navigate through the weather forecasts using these Buttons.

Splash Screen Page,

Weathr will include a Welcome or similar page that describes the application's tagline and logo, its functionality, developer details and Login/Register Button links.

ANALYSIS MODELS

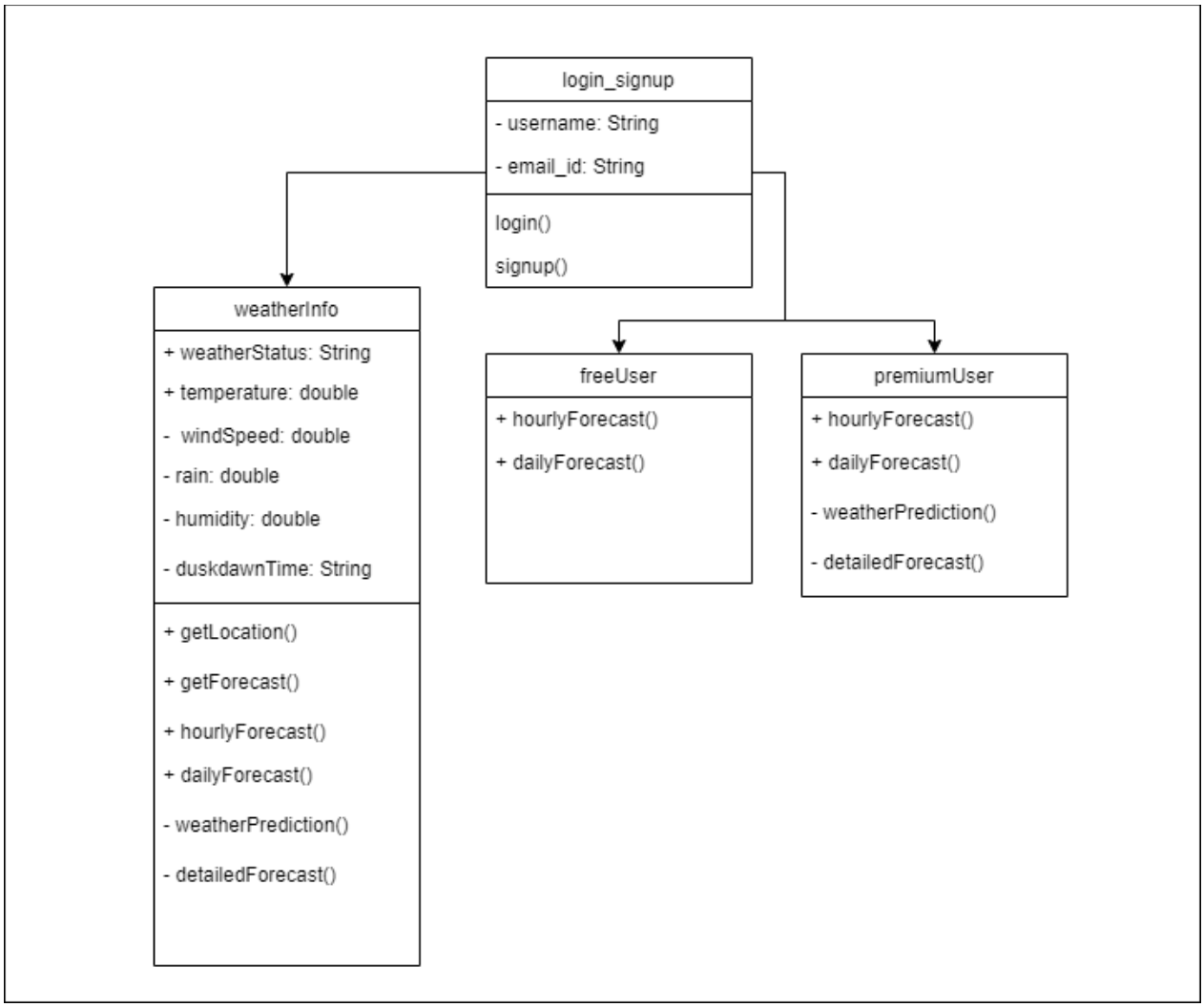
Use-Case Diagram



tool used: draw.io

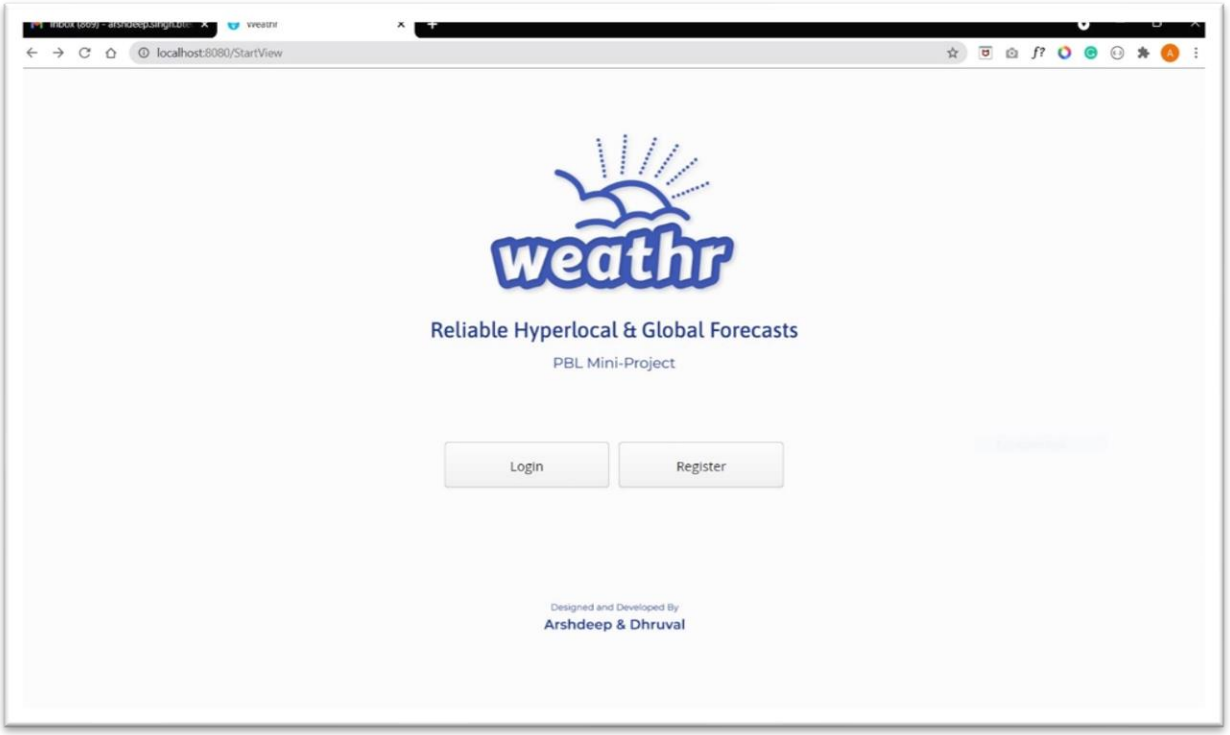
Class Diagram

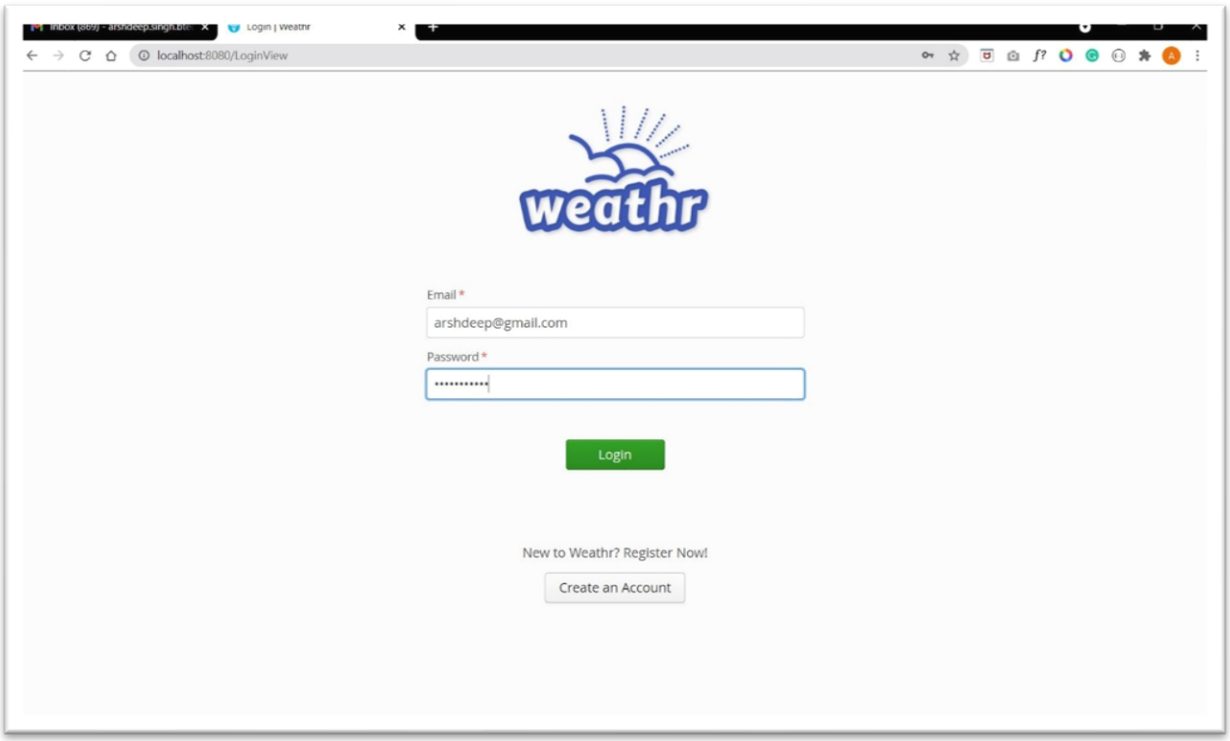
Weathr App

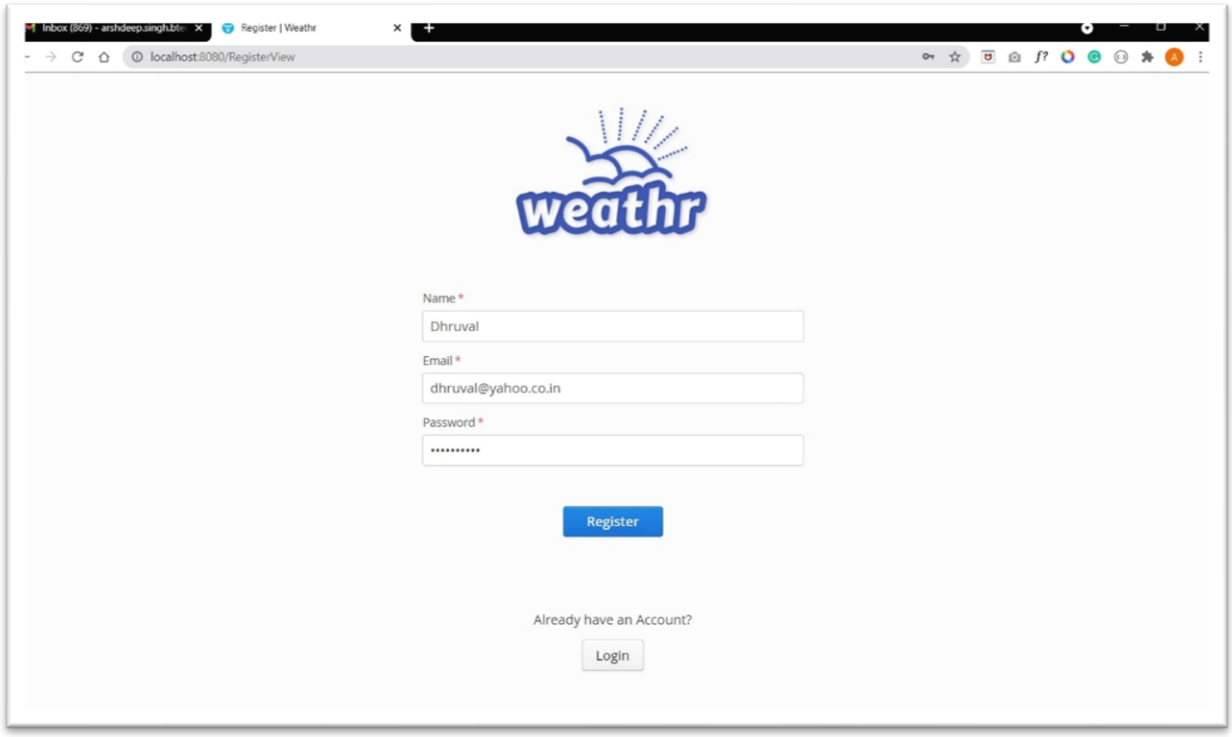


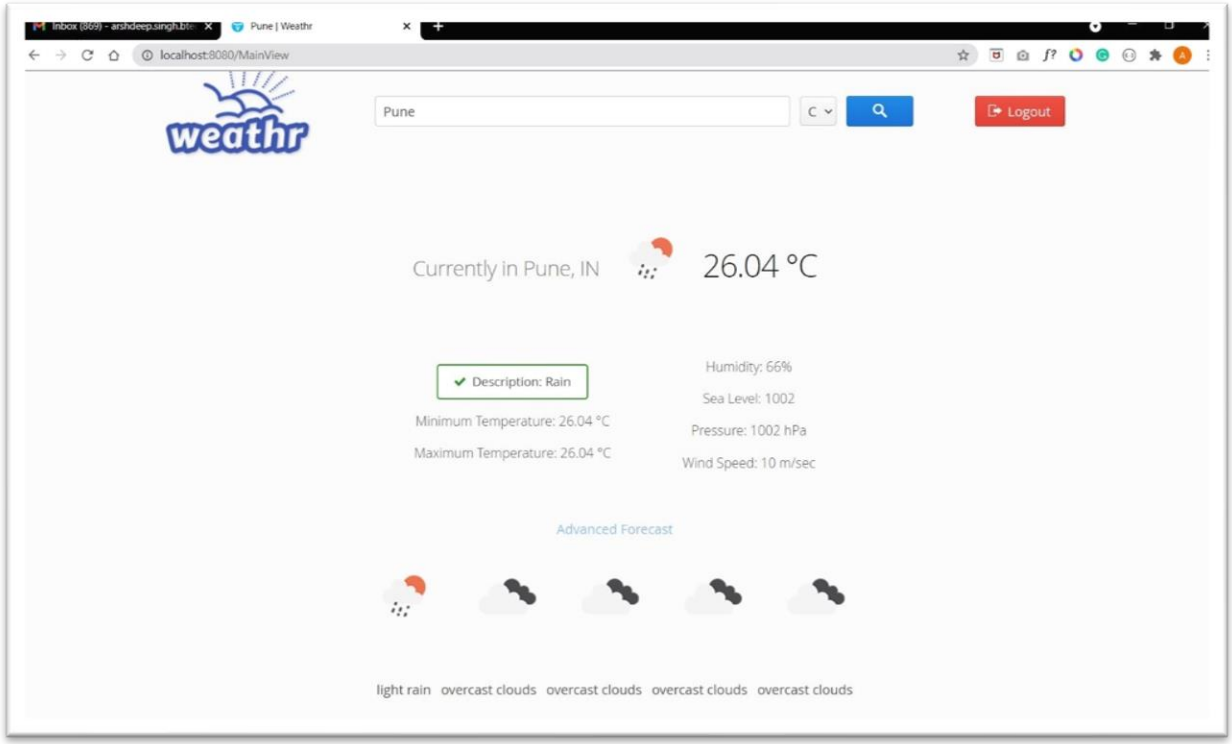
tool used: draw.io

IMPLEMENTATION SCREENSHOTS






Register | Weathr
localhost:8080/RegisterView
weathr
Name *
Dhruval
Email *
dhruval@yahoo.co.in
Password *
Register
Already have an Account?
Login


Pune | Weathr
localhost:8080/MainView
weathr
Pune
C
Logout
Currently in Pune, IN
26.04 °C
Description: Rain
Minimum Temperature: 26.04 °C
Maximum Temperature: 26.04 °C
Humidity: 66%
Sea Level: 1002
Pressure: 1002 hPa
Wind Speed: 10 m/sec
Advanced Forecast
light rain
overcast clouds
overcast clouds
overcast clouds
overcast clouds

MySQL Database

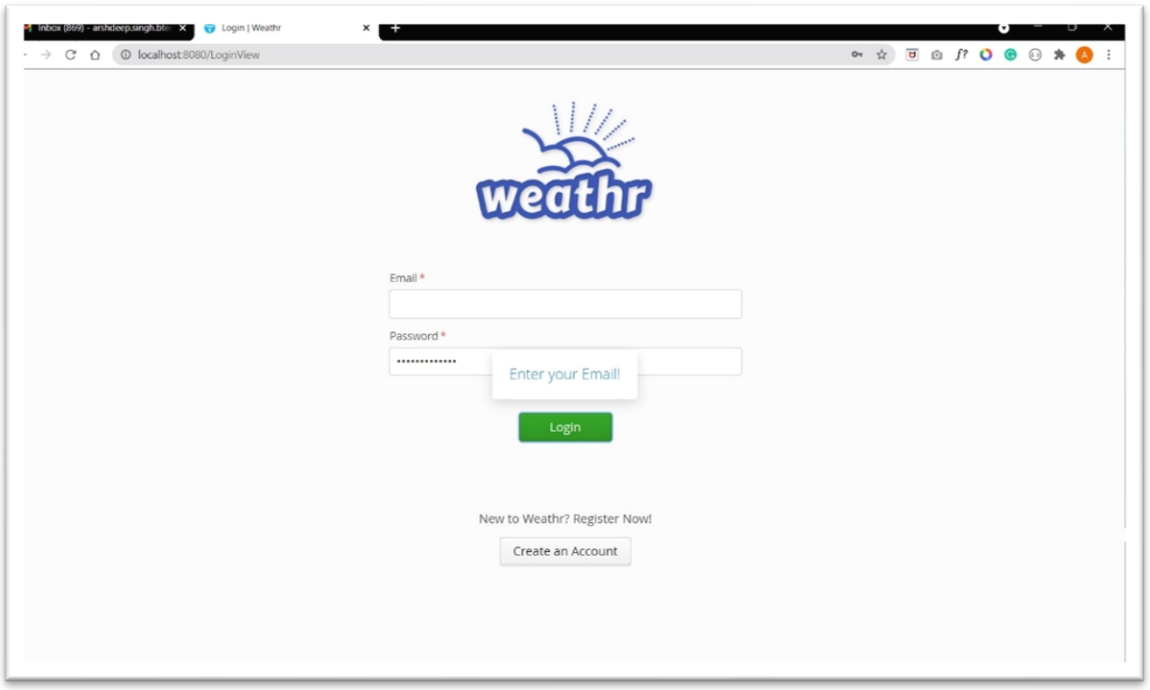
```
mysql> create database weathr;
Query OK, 1 row affected (0.22 sec)

mysql> use weathr;
Database changed
mysql> create table user(
    -> name varchar(50) NOT NULL,
    -> email varchar(100) NOT NULL,
    -> password varchar(100) NOT NULL,
    -> PRIMARY KEY(email)
    -> );
Query OK, 0 rows affected (0.27 sec)

mysql> show tables;
+------------------+
| Tables_in_weathr |
+------------------+
| user             |
+------------------+
1 row in set (0.10 sec)

mysql> describe user;
+----------+--------------+------+-----+---------+-------+
| Field    | Type         | Null | Key | Default | Extra |
+----------+--------------+------+-----+---------+-------+
| name     | varchar(50)  | NO   |     | NULL    |       |
| email    | varchar(100) | NO   | PRI | NULL    |       |
| password | varchar(100) | NO   |     | NULL    |       |
+----------+--------------+------+-----+---------+-------+
3 rows in set (0.01 sec)
```

Registered Users

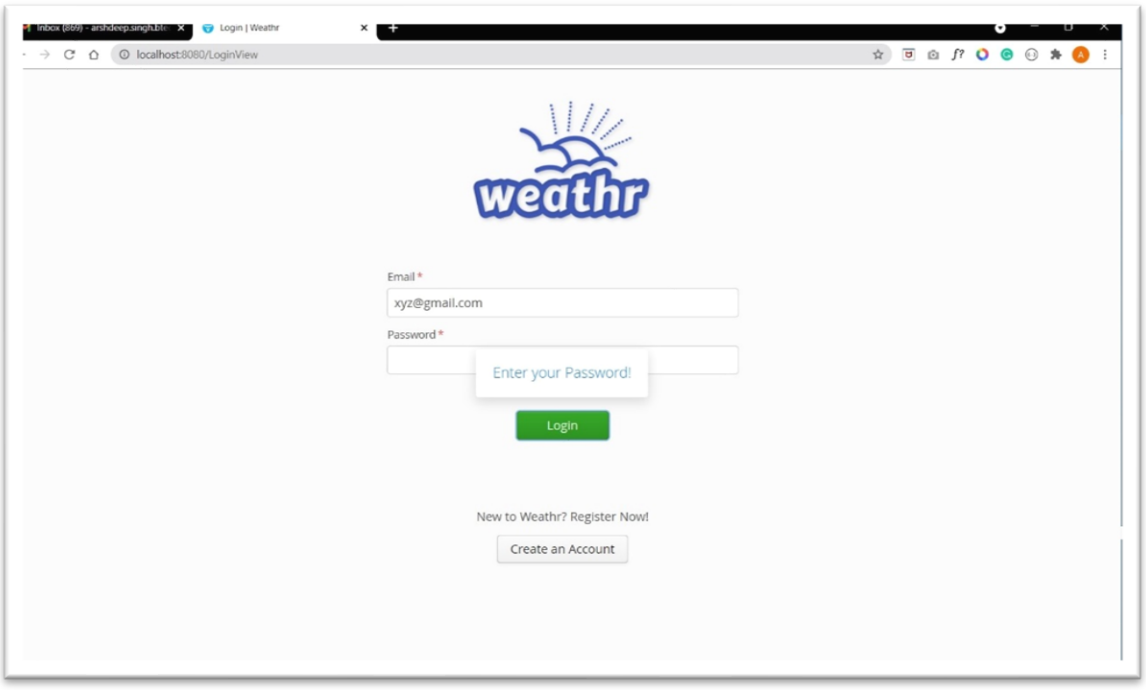
```
mysql> select * from user;
+----------+---------------------+-------------+
| name     | email               | password    |
+----------+---------------------+-------------+
| Arshdeep | arshdeep@gmail.com  | arshdeep123 |
| Dhruval  | dhruval@yahoo.co.in | dhruval123  |
+----------+---------------------+-------------+
2 rows in set (0.00 sec)

mysql>
```

TEST CASES

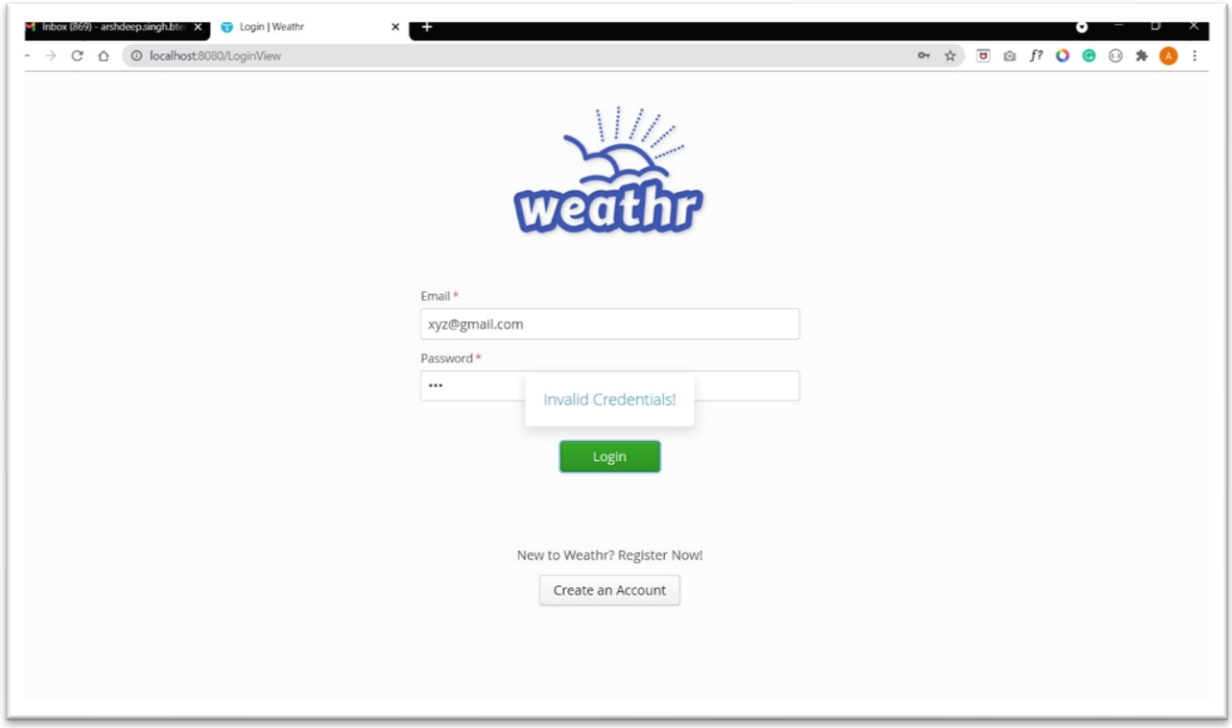
- If Email Field is Empty



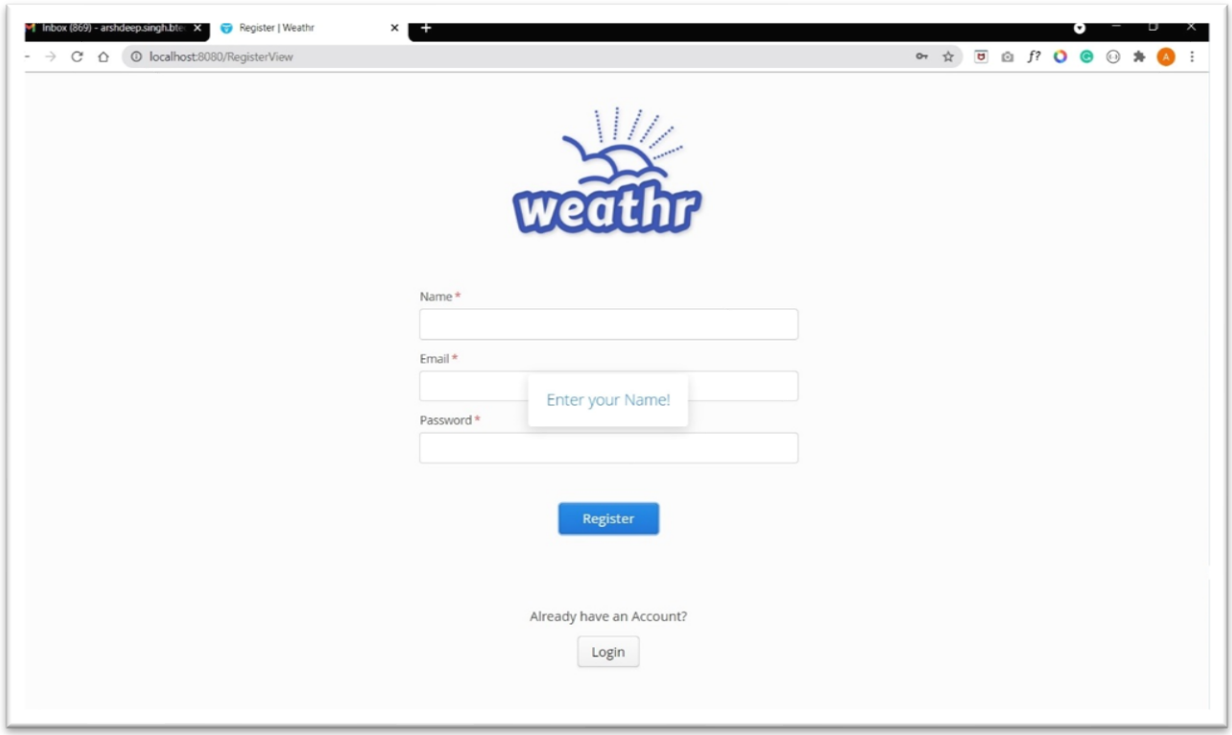
- If Password Field is Empty



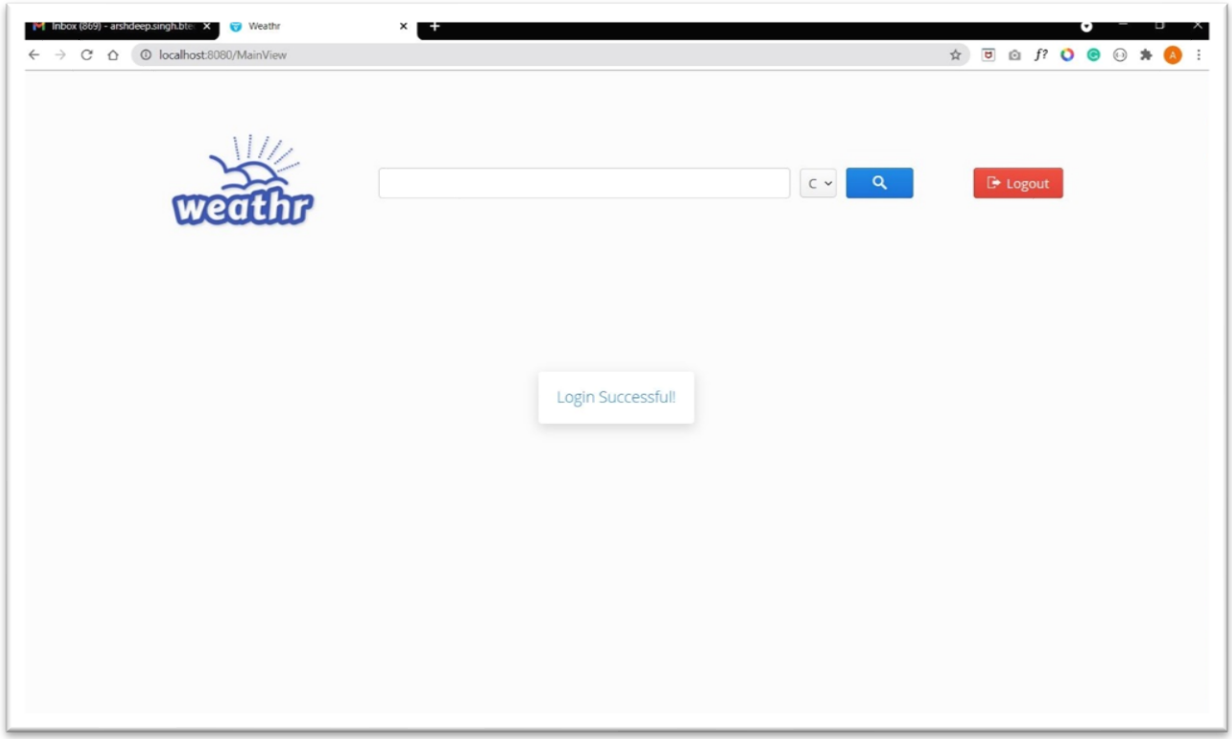
- If User is not registered or Credentials are Invalid



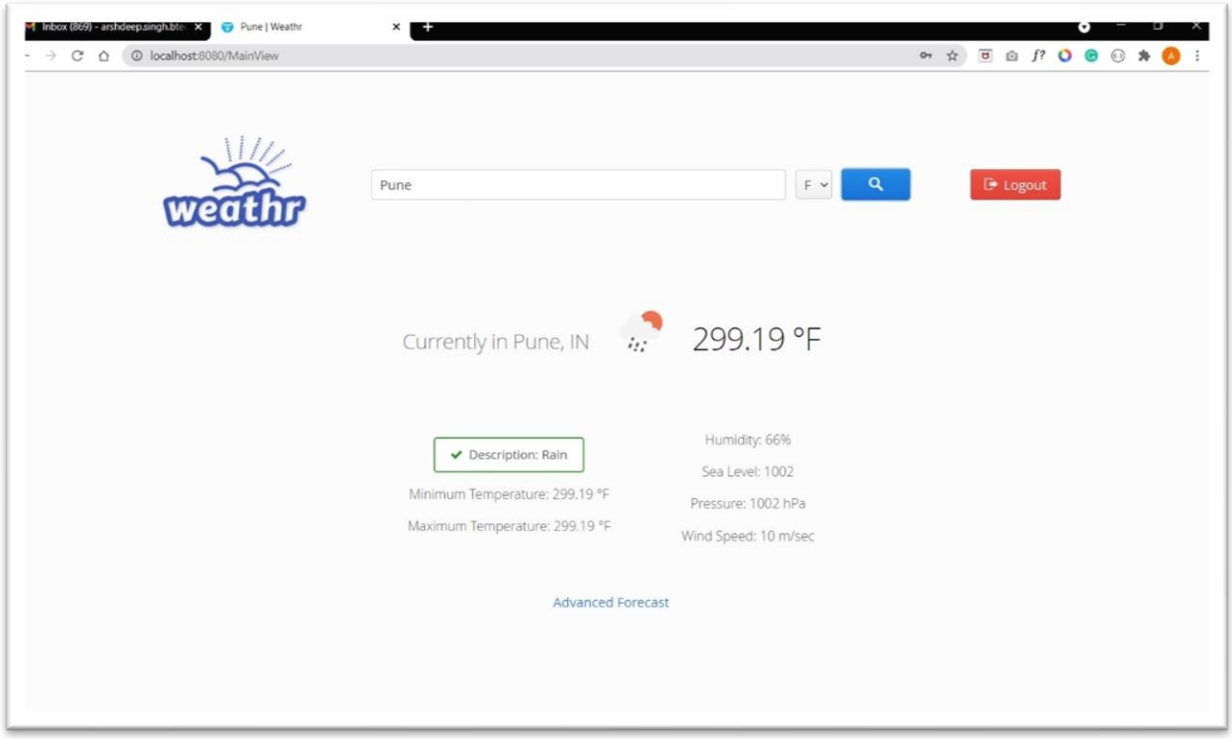
- If Name Field is Empty while Registering



- On Successful Registration or Login



- Searching Weather Details for Pune City



CONCLUSION

Rapid and abrupt climate changes have remarkably increased the importance of a weather app. Today, Weathr can provide accurate forecasts to enable users to make informed decisions.

With Weathr, it is possible to check the weather of any country and any place using our fingertips. A simple online search can give a plethora of information about the weather conditions of a particular place. The travel and tourism industry can leverage this benefit to plan tours across different parts of the world. Weathr can be useful for various other industry sectors and individuals alike.

FUTURE SCOPE

Weathr can be integrated with advanced features and technological progress such as Artificial Intelligence Models along with real-time alerts thereby serving multiple roles.

GLOSSARY

This part involves acronyms and abbreviations used in the SRS

- OS: Operating System
- JDBC: Java Database Connectivity
- API: Application Programming Interface
- BF: Brute Force