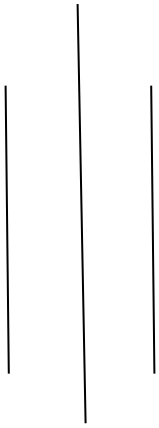
# 4CS017: Internet Software Architecture

## Weather App



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Date of Submission: 5/21/2023

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## Acknowledgement

My sincere appreciation goes out to Mr. , the module leader, for allowing me the chance to learn more about the module by working on this project called the 8x8x8 Led Cube. I would especially want to thank Mr. Raj Pradhan and our mentor Mr. Pradeep Mani Dixit for their time and effort throughout the year. I found their recommendations and assistance to be helpful for completing the project.

# Contents

# 1. Prototype One:

The Weather App is a user-friendly online application that pulls weather data from the OpenWeatherMap API in real-time. Its major goal is to provide consumers looking for weather information for numerous cities with a smooth and aesthetically pleasing experience.

To provide a more seamless starting experience, the app opens with the most recent weather data for a particular city. To guarantee simplicity of use and clear navigation, the app's UI has been thoroughly thought out.

Users may quickly examine weather information for any city of their choosing thanks to the search tool, which is one of its distinguishing features. The app contacts the OpenWeatherMap API to get the most recent weather information for a particular place once the user types a city name in the search field and submits the request. Users are then given a thorough rundown of the current weather conditions on the webpage using the information that was just collected. Crucial factors including temperature, rainfall, wind speed, humidity, and others are included in the meteorological information provided.

Many difficulties that arose during the development phase were successfully overcome. The management of API rate limits, which prevented usage limits from being exceeded during testing and development, the parsing and organization of the data obtained from the API's JSON response, and the implementation of robust error handling, which provided clear error messages for issues such as invalid city names or API request issues, were some of these.

To sum up, the Weather App effectively makes use of the OpenWeatherMap API to supply real-time weather data in a user-friendly manner. Users may easily get up-to-date weather information for any city of interest with the help of its initial city display and robust search feature. The app makes sure that the experience is dependable and pleasurable by overcoming issues with API usage, data management, and error handling. The Weather App is a useful tool for quickly checking weather conditions, whether for daily planning or staying updated about the weather.

## 2. Prototype Two:

This report describes the second iteration of the Weather App prototype, which adds server-side caching using PHP and MySQL as well as the ability to show weather data from the previous week.

Server-side caching is now used by the Weather App to enhance speed and reduce API requests. The app may easily access and retrieve cached data without making repeated API connections by saving weather information got from the OpenWeatherMap API in a local database. The presented weather information is always current thanks to an expiry mechanism.

Additionally, users of the upgraded software may get weather information from the previous week. The program gets and displays historical weather data from the database for each day for the chosen time. With the help of this function, users may examine weather trends and learn more about earlier weather conditions.

The inclusion of the prior week's weather data display and the deployment of server-side caching with PHP and MySQL improved the Weather App's overall functionality and user experience. Users may receive reliable and pertinent data to make decisions based on their weather-related needs with increased performance and the availability of historical weather information.

## 3. Prototype Three:

The implementation of the Weather App's definitive version is shown in this report. It features clientside caching for offline access, hosting on a free web hosting platform, and browser caching using the localStorage JavaScript API.

The Weather App makes use of localStorage API browser caching to enhance efficiency and reduce network calls. As a result, fewer network connections are necessary, and the app may store and get weather data locally in the user's browser. The program checks the localStorage upon launch to see whether cached weather data is present and current. If it does not, the app retrieves the information from the OpenWeatherMap API and saves it to the localStorage for later use. The weather data is always up to date thanks to a cache end mechanism.

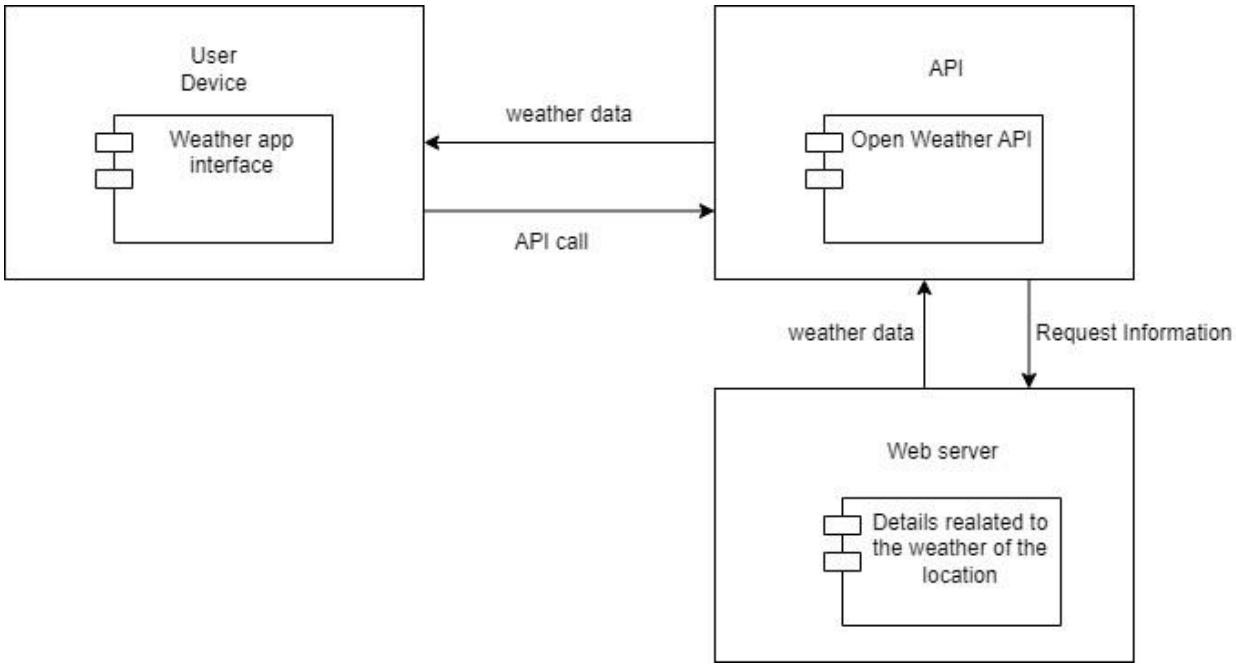
Additionally, the Weather App is housed on a free website hosting service, guaranteeing its accessibility without any added fees or technical difficulties.

Through client-side caching, offline access is made possible, and the app saves the obtained weather information in the browser's localStorage. Because of this, users may access the cached data even if their device is disconnected or having connectivity troubles.

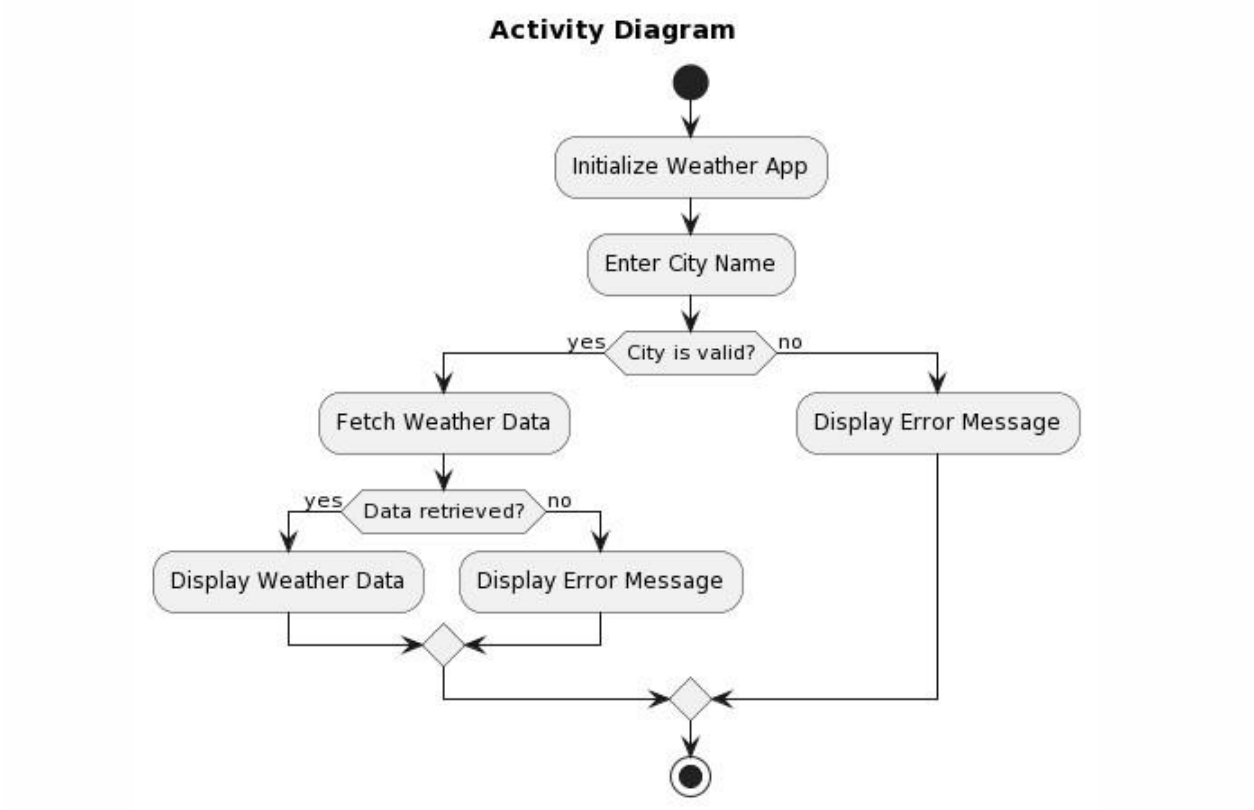
In conclusion, the final Weather App version successfully integrates browser caching using the localStorage JavaScript API. Client-side caching enables offline access for the software, which has the advantage of being hosted on a free platform. With these improvements, performance and accessibility have been greatly improved, providing users with a dependable and smooth experience while getting and viewing meteorological data in a variety of contexts.

# 4. UML Diagrams:

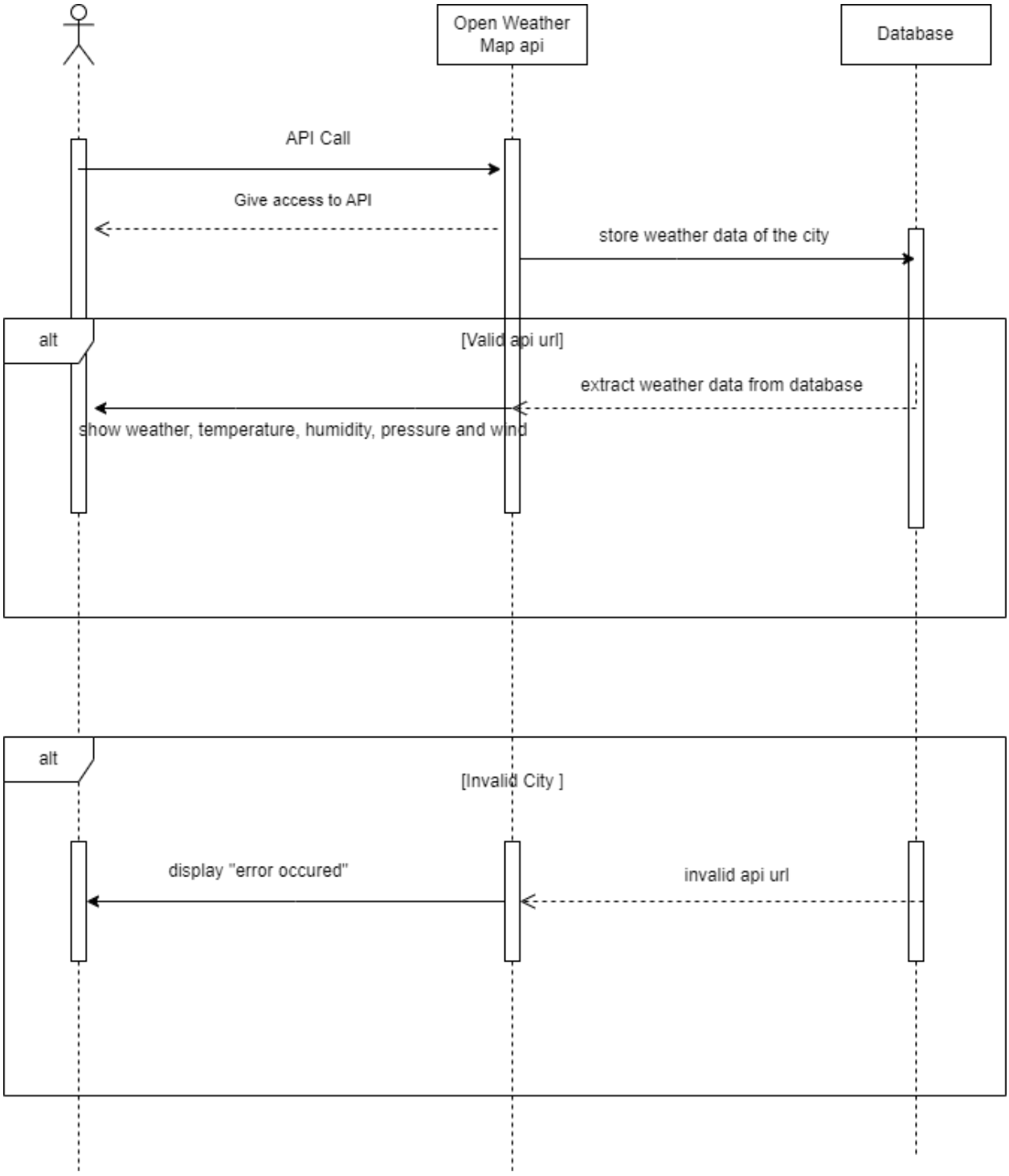
## I. Deployment Diagram:



## II. Activity Diagram:



## III. Sequence Diagram:



## 5. Weather APP Link:

alanweather.infinityfreeapp.com