Weather App – Project Report

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1. Project Title

Weather App – A web-based application to fetch and display current weather information using city names or ZIP codes.

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2. Objective

The main objective of this project is to create a simple and responsive web application that allows users to check the current weather of any city or ZIP code worldwide using real-time data from the OpenWeatherMap API.

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3. Technologies Used

- **HTML** – For structuring the web pages.
- **CSS** – For styling the app and making it responsive.
- **JavaScript** – For interactivity and fetching API data asynchronously.
- **OpenWeatherMap API** – To retrieve real-time weather data including temperature, description, and icons.

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4. Features

- Input field for **city name** or **ZIP code** with country code.
- Submit button to fetch current weather data.
- Display of:
    - Temperature (°C)
    - Weather description
    - Weather icon
- Responsive layout compatible with mobile, tablet, and desktop.
- Error handling for invalid locations or API issues.

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5. System Overview

The Weather App works by taking user input (city name or ZIP code) and sending a request to the OpenWeatherMap API. The API returns JSON data containing weather information, which is then displayed dynamically on the web page, including:

1. Temperature in Celsius.
2. Weather description (e.g., “Clear Sky”, “Partly Cloudy”).
3. A corresponding weather icon.

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6. Implementation

6.1 HTML

- Provides the input field for city/ZIP code.
- Includes a button to fetch weather and a container to display results.
- Structured for accessibility and responsive layout.

6.2 CSS

- Styles the input, button, and result container.
- Implements responsive design to support different screen sizes.
- Adds visual cues like weather icons and background colors.

6.3 JavaScript

- Uses fetch() and async/await to call the OpenWeatherMap API.
- Processes the API response to extract temperature, description, and icon.
- Updates the HTML dynamically with retrieved weather data.
- Handles errors and invalid input gracefully.

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7. How to Run

1. Clone or download the repository.
2. Navigate to the project directory.
3. Replace the apiKey in script.js with your OpenWeatherMap API key.
4. Open index.html in a web browser, or use a local server (e.g., Live Server in VS Code) for live reload.

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8. Testing

- Tested with city names like "Bengaluru,IN", "Paris,FR", "London,UK".
- Tested with ZIP codes like "560001,IN" and "10001,US".
- Verified that invalid locations (e.g., "Latveria") display appropriate error messages.
- Tested on multiple devices for responsive design (desktop, tablet, mobile).

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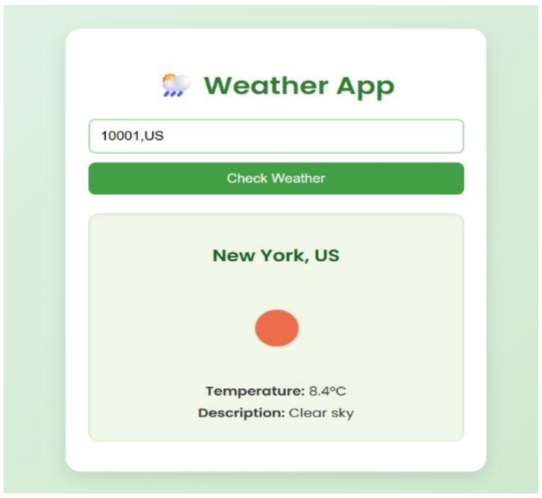
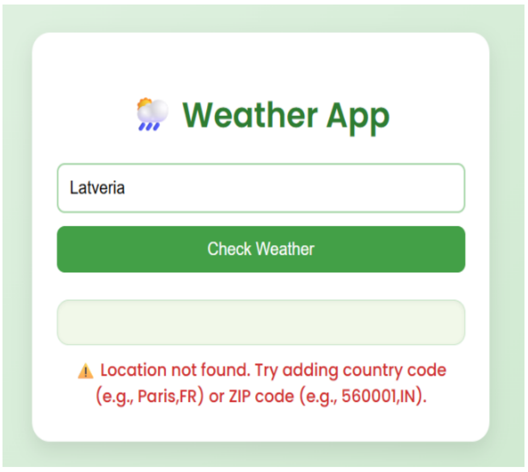
9. Screenshots



10001,US

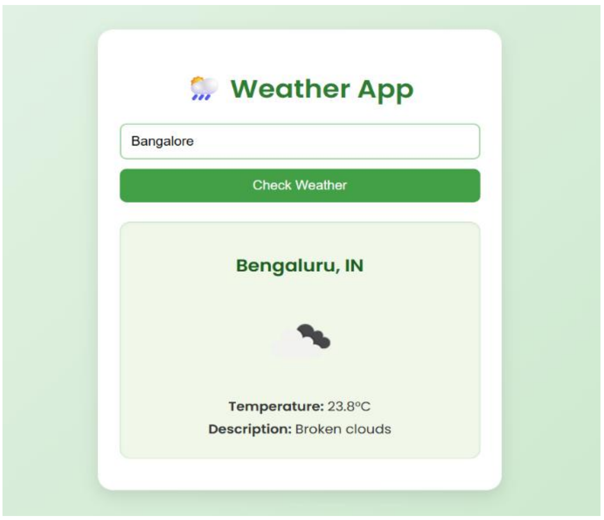
New York, US

Temperature: 8.4°C
Description: Clear sky



Latveria

⚠ Location not found. Try adding country code (e.g., Paris,FR) or ZIP code (e.g., 560001,IN).



Bangalore

Bengaluru, IN

Temperature: 23.8°C
Description: Broken clouds

10. Challenges

- Ensuring ZIP code coverage for all regions; some API responses may vary.
- Handling asynchronous API calls and updating the DOM dynamically.
- Making the design responsive across all screen sizes.

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11. Conclusion

The Weather App successfully demonstrates how to fetch and display live weather data using an API. It provides a clean, responsive interface for users to check weather information for cities or ZIP codes. Error handling ensures a smooth user experience even with invalid input.

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12. References

- OpenWeatherMap API
