Documentation for Weather Forecast Application

Student Name:

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Project Title:

Weather Forecast Application Development

Project Overview

This project is a weather forecast web application developed using **HTML**, **JavaScript**, and **Tailwind CSS**, integrating the **OpenWeatherMap API** to display real-time weather information.

Technologies Used

- HTML5
- JavaScript (Vanilla)
- Tailwind CSS (via CDN)
- OpenWeatherMap API
- Geolocation API
- localStorage (for recent search history)

Project Structure

bash
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```
weather-forecast-app/
index.html          # Main UI structure
script.js           # JavaScript logic for fetching & rendering weather
README.md           # Project documentation and setup guide
(optional) screenshot.png
```

Code Documentation Highlights

1. DOM Access & Event Binding
Variables like `searchButton`, `locationButton`, and `cityInput` are initialized and linked to respective UI elements using `document.querySelector`.
Example:

javascript
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```
const cityInput = document.querySelector(".city-input");
```

2. API Integration
The app fetches forecast data using OpenWeatherMap's RESTful endpoints with `fetch()`, and processes JSON responses to update the DOM.

3. Event Listeners

- Clicking **Search** or pressing **Enter** calls `getCityCoordinates()`.
- Clicking **Use Current Location** calls `getUserCoordinates()`.
- Changing the recent **city dropdown** updates the forecast.

4. Input Validation
If the user enters an empty string or an invalid city name, appropriate alerts are shown using conditional checks.

5. Weather Rendering
Forecast cards are dynamically created using template literals and appended using `insertAdjacentHTML()`.

6. Recent Cities Feature
Utilizes `localStorage` to store and render recent searches in a dropdown.

7. Error Handling
All fetch and geolocation errors are wrapped in `.catch()` with user-friendly alert messages.

README.md Summary

The README includes:

- Project features
- Technologies used

- Setup instructions (API key usage, running index.html)
- Screenshot placeholder
- Author credit
- License (for academic learning)

Deliverables

- Fully working weather forecast application (HTML + JS + Tailwind)
- All features implemented as per assignment
- `README.md` included for documentation
- All code thoroughly commented
- Git version-controlled project (suggested platform: GitHub)
