Week 4: Frontend Integration & Final Project

Weather Application

Description

A fully responsive weather application that retrieves real-time weather data using the OpenWeatherMap API. Users can search any city and view current weather conditions such as temperature, humidity, wind speed, and weather description. The project demonstrates **frontend–backend integration**, asynchronous JavaScript using fetch()/async-await, API consumption, UI rendering, and GitHub Pages deployment.

Features

- Current weather information
- Temperature, humidity, wind speed, and weather condition display
- Search by city name
- Loading state with spinner
- Error handling (404 city not found, network errors)
- Responsive layout (mobile-first)
- Weather icons support
- localStorage to store last searched city

OpenWeatherMap API Use

- Current Weather Data
- Supports JSON responses
- Free tier suitable for learning & projects

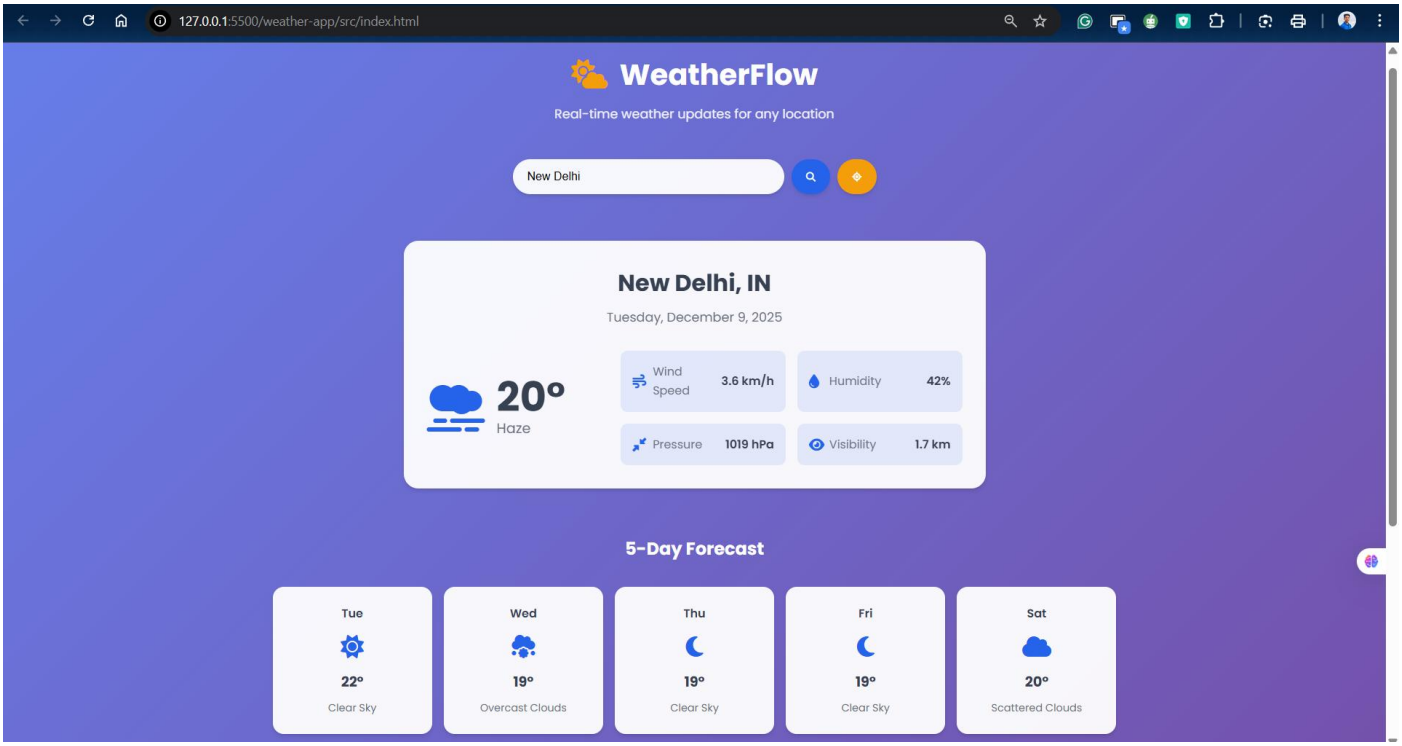
API Reference:
https://openweathermap.org/current

✓ Visual Documentation

Include screenshots of:

- Home screen

- Search results



✓ Technical Details

- **Async Workflow**
  - fetch() to call API
  - async/await for cleaner asynchronous logic
- **Data Structures**
  - Weather data objects from API
  - localStorage for last searched city
- **Algorithms**
  - Input validation
  - Error state detection (404, empty input)
  - DOM update logic in UI component

✓ Testing Evidence

- Tested valid/invalid city names
- Checked network error handling
- Verified spinner visibility during loading
- Tested UI responsiveness on different devices

Component Architecture

index.html → Main UI structure (search bar, result container)
style.css → Styling, layout, responsive design
config.js → Stores API base URL + API key variable
api.js → Handles API calls using fetch()
ui.js → Updates the DOM (show data, errors, loading)
app.js → Main controller (connects UI + API + events)

Data Flow Diagram