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St. MOTHER THERESA ENGINEERING COLLEGE

COMPUTER SCIENCE ENGINEERING

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Phase 1

FRONT END TECHNOLOGY

LIVE WEATHER DASHBOARD

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Phase 1 – Problem Understanding & Requirements

Problem Statement

People need accurate, real-time weather information to plan daily activities and stay safe (e.g. travel plans, outdoor work). A unified live weather dashboard can solve this by aggregating data (temperature, precipitation, forecasts) for user-selected locations. Modern APIs make it possible to “access current weather data for any location on Earth” in JSON form. By leveraging such APIs (e.g. OpenWeatherMap’s Current Weather and Forecast endpoints), the dashboard will fetch and display essential weather data in a clear interface, addressing the problem of fragmented weather info sources

Users & Stakeholders

- **End Users:** General public (commuters, travelers, outdoor workers, hobbyists) who want up-to-date weather info to make decisions. For example, a traveler might use the dashboard “to see the weather outlook for multiple cities so that I can plan a trip”.
- **Stakeholders:** Meteorological agencies or organizations that may want to publish weather data; app maintainers who ensure data accuracy; and educators or researchers interested in weather patterns.
- **Clients/Professors:** The supervising instructor (as client), and our development team (us) responsible for delivering a functional dashboard. (All features and design choices will prioritize user needs and stakeholder requirements.)

User Stories

- *As a user*, I can **search for a city** so that I can retrieve its current weather and forecast.
- *As a user*, I want the dashboard to **display key weather details** (city name, date, icon for conditions, temperature, humidity, wind speed, UV index) for any searched location.
- *As a traveler*, I want to see forecasts for multiple cities so I can plan trips accordingly.
- *As a user*, I can **click on a past search (history)** to quickly re-display that city's weather (the app should save search history locally).
- *As a user*, I can **switch temperature units** between Celsius and Fahrenheit (optional for later phases).

MVP Features

- **Location Search:** Input field where user enters city name (and optionally current location lookup). On search, fetch weather data.
- **Current Weather Display:** Show current conditions for the city – including icon (sun/cloud/rain), temperature, humidity, wind speed, UV index.
- **Multi-day Forecast:** Show a 5-day forecast (with date, weather icon, high/low temperature, humidity) for the city.
- **Persistent Search History:** Save searched cities in local storage so users can click them to reload that city's weather.

- **Responsive UI:** Clean, mobile-friendly layout (cards or charts) that clearly labels data. (E.g. as shown below, typical weather icons and values.)

To conceptualize the UI, the dashboard will display weather icons (sun, cloud, rain, etc.) alongside numeric values (temperature, humidity, etc.). A sample weather icon set is shown above. The app will call weather APIs for data – for example, OpenWeatherMap’s **Current Weather** API (returns JSON with temperature, conditions, etc.) and **5-day Forecast** API (returns future data). These endpoints provide all needed fields (e.g. temp, humidity, weather.description) that our front end will render.

Wireframes / API Endpoint List

- **Wireframe Sketch:** The home page UI (wireframe) will include a top **Search Bar** and two main panels: a **Current Weather** card and a **Forecast** section (e.g., row of day cards or a chart). For instance, after entering a city, the current conditions (with icon) appear prominently, and below is a scrollable 5-day forecast.
- **API Endpoints:** We will use public REST endpoints such as:
 - GET /weather?q={city name}&appid={API_KEY} (OpenWeatherMap current weather)
 - GET /forecast?q={city name}&appid={API_KEY} (OpenWeatherMap 5-day forecast)
 - *(Optionally)* OpenWeatherMap One Call API for combined data (current/hourly/daily). These endpoints return JSON payloads. For example, /weather returns fields like "temp": ..., "wind": {...}, etc. The frontend wireframe lists these data fields near the icons in the UI.

Acceptance Criteria

- **Search Functionality:** GIVEN the dashboard, WHEN I search for a valid city, THEN it displays that city's current weather and 5-day forecast (with name, date, icon, temperature, humidity, wind, UV index), and adds the city to search history.
- **Data Display:** WHEN viewing a city's weather, THEN I see: city name, current date, weather condition icon, temperature, humidity, wind speed, and UV index color-coded.
- **Forecast Display:** WHEN viewing the forecast, THEN I see 5 days of data (each with date, icon, temperature, humidity).
- **Search History:** WHEN I click a city in the saved search list, THEN the dashboard updates to show that city's weather again.
- **User-friendly UI:** The interface must be clear and responsive on mobile devices. (E.g. legible icons/ text and color-coded UV index.)