**Weather Dashboard with Chatbot Integration using OpenWeather API**

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**Objective:**

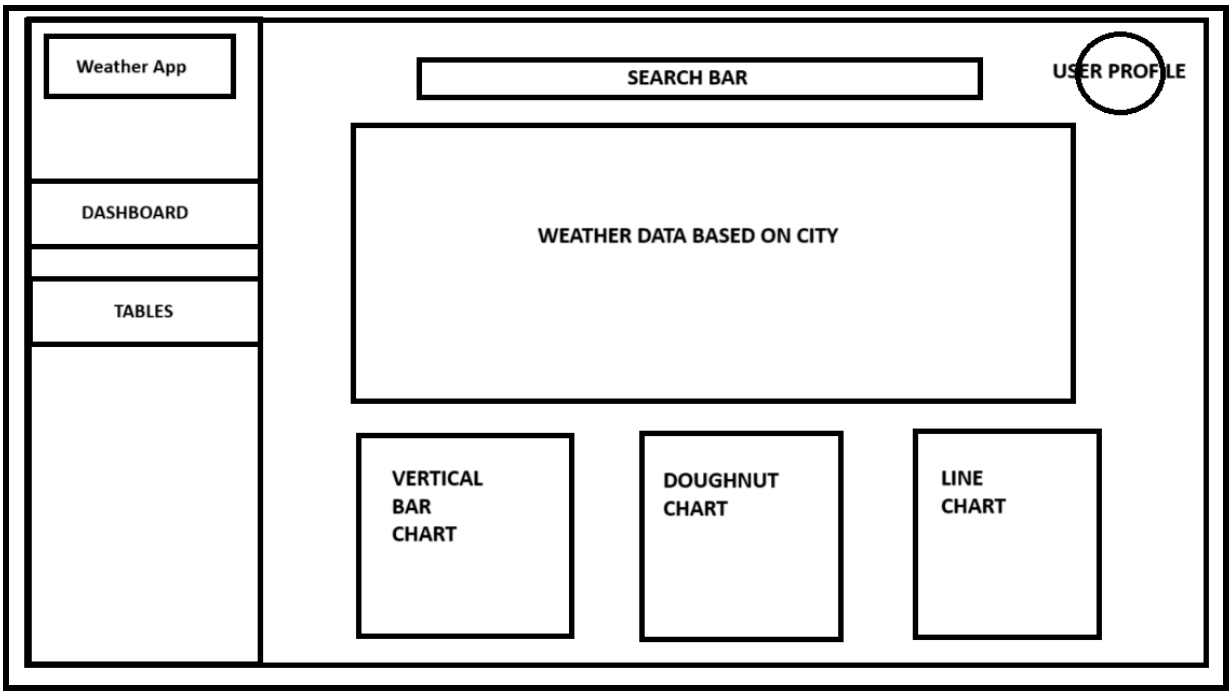
Create a fully responsive weather dashboard using **HTML**, **CSS,** and **Javascript**.

1. For weather information, you will use the **OpenWeather API** (free tier)
2. For the chatbot API, you will use the **Dialogflow API**
3. For data visualization you will use **Chart.js**

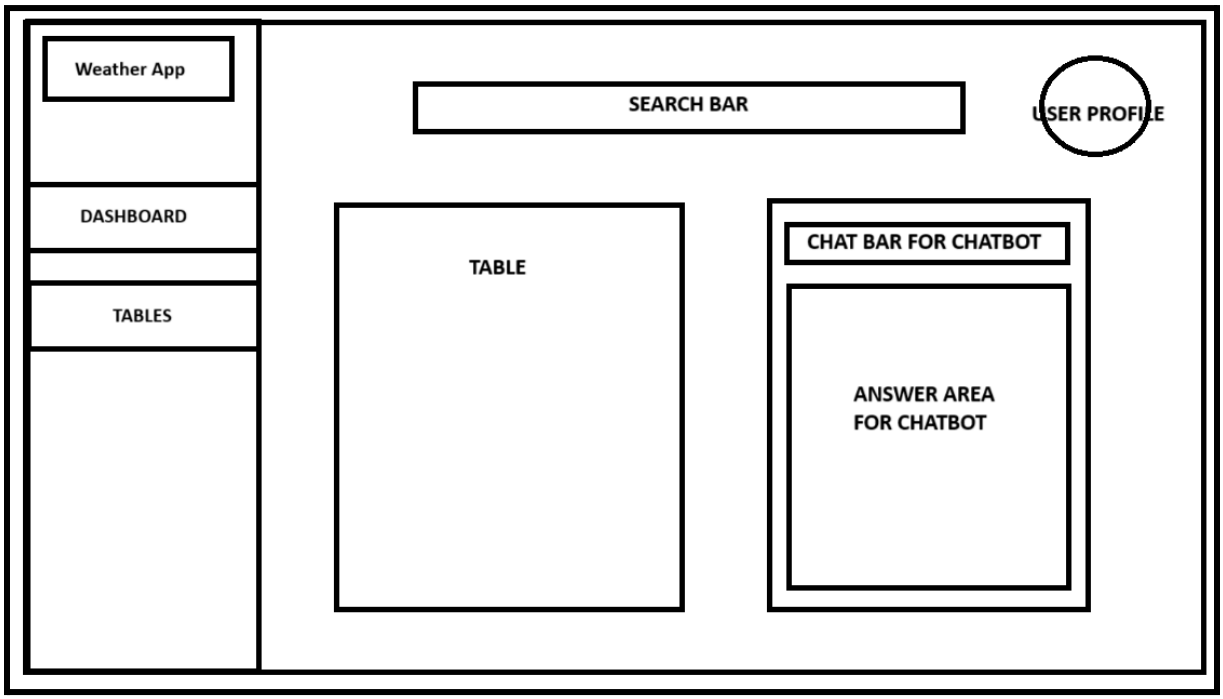
Your dashboard will consist of:

- A side menu (which has the logo of the weather app at the top, an option to go to the dashboard page and an option to go to the tables page)
- A widget for weather details based on the city selected by the user.
    - The background of the widget should change based on the weather conditions of the city chosen (e.g; if the user searched for “London” and the weather is “overcast clouds” then the background of the widget should be cloudy.) You can consult this link for weather conditions shown by the OpenWeather API.
    - There should be **three** types of charts shown under the weather widget using Chart.js:
        - 1. **Vertical Bar Chart** showing temperatures for the next 5 days in the city.
        - 2. **Doughnut Chart** showing the percentage of different weather conditions over the 5 day period (e.g; if there are 4 sunny days and 1 cloudy day, then the doughnut chart will depict almost the whole pie as sunny and a small slice as cloudy).
        - 3. **Line Chart** showing temperature changes for the next 5 days.
- To your charts you must add the following **animations (using Chart.js)**:
    - **Delay** (for vertical bar chart and doughnut chart)
    - **Drop** (for line chart)
- A **table** with temperature forecast for the next 5 days.
    - The first **10 entries** should be shown, after that you should implement **pagination**.
- A widget that has a **chatbot** that answers questions from the user **related to the information displayed in your table** (for example, if your table displays the temperatures across five days and the user asks “What was the highest, lowest and average temperature this week?” the chatbot should reply with the highest, lowest and average temperatures).

A sample layout for the dashboard page has been shown below:




A sample tables page has been shown below:

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**Tools Required:**

- HTML, CSS

- JavaScript (vanilla or jQuery)
- OpenWeather API (Free plan)
- Chart.js

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**Key Learning Outcomes:**

1. Practice making API requests using JQuery/Ajax/Fetch API.
2. Learn to manipulate API responses and display data dynamically on a webpage.
3. Enhance user experience through responsive design and user-friendly interfaces.
4. Handle errors such as invalid city input, API errors or where required.

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**Assignment Instructions:**

**Step 1: Setting Up OpenWeather API**

1. **Create an API Key:**
    - Sign up to OpenWeather API by going to this link.
    - Confirm your email address.
    - Go to your dashboard, under API Keys you will find your "Default" API key. You can use this or generate a new one by giving the key a name and clicking on "Generate".
    - **Note**: The free plan has certain restrictions, amongst this is the fact that you can only do **60 calls/minute**. Please keep this in mind when working with this API.
2. **API Documentation Overview:**
    - The API calls you will need for this assignment are:
        - Current weather
            1. The format for this API call is: https://api.openweathermap.org/data/2.5/**weather**?lat={lat}&lon={lon}&appid={API key}
            2. You can also use this to specify the city name: https://api.openweathermap.org/data/2.5/weather?q={**city name**}&appid={API key}
        - 5-day weather forecast
            1. The format for this API call is api.openweathermap.org/data/2.5/**forecast**?lat={lat}&lon={lon}&appid={API key}
        - In the APIs you must replace {API key} with your own API that you generated in step 1 (or use the default one).
        - Some parameters you will need are:
            1. lat - which is for latitude of the city you want to get information from

2. lon - which is for the longitude of the city you want to get information from
3. units - which are in the formats standard, metric and imperial

- By default the API returns data in JSON format. It returns several fields that you can use. For example, when searching for London's current weather, the API returns this:

```
https://api.openweathermap.org/data/2.5/weather?
q=London&appid={API key}
```


```
{
"coord": {
  "lon": -0.13,
  "lat": 51.51
},
"weather": [
  {
    "id": 300,
    "main": "Drizzle",
    "description": "light intensity drizzle",
    "icon": "09d"
  }
],
"base": "stations",
"main": {
  "temp": 280.32,
  "pressure": 1012,
  "humidity": 81,
  "temp_min": 279.15,
  "temp_max": 281.15
},
"visibility": 10000,
"wind": {
  "speed": 4.1,
  "deg": 80
},
"clouds": {
  "all": 90
},
"dt": 1485789600,
"sys": {
  "type": 1,
  "id": 5091,
  "message": 0.0103,
  "country": "GB",
  "sunrise": 1485762037,
  "sunset": 1485794875
},
"id": 2643743,
"name": "London",
"cod": 200
}
```

**Step 2: Frontend Layout (HTML & CSS)**

1. **Create the HTML Structure:**
    - Design a basic HTML structure with the following elements:
        - An input box for users to enter a city name.
        - A button labeled “Get Weather” to fetch the data.
        - Sections to display:
            - Current weather information (city name, temperature, humidity, wind speed, weather description, and icon).
            - 5-day weather forecast (date, temperature, and weather conditions).
2. **Apply CSS Styling:**
    - Use CSS to style the layout, ensuring the design is responsive (e.g., using flexbox or grid).
    - Add a background image or gradient related to the weather theme for a more polished look.

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**Step 3: Integrating the API**

1. **Fetch Current Weather Data (Main Task):**
    - Use any method (Ajax/JQuery/Fetch) to request the OpenWeather API when the user submits a city name.
    - Extract data from the API response such as
        - City name
        - Temperature (allow the user to choose between Celsius and Fahrenheit)
        - Humidity
        - Wind speed
        - Weather description
        - Weather icon
    - Display the weather data dynamically on the webpage.
2. **5-Day Weather Forecast (Secondary Task):**
    - Make an additional API request to the /forecast endpoint to retrieve a 5-day forecast for the city.
    - Display the forecast data (e.g., daily temperature, weather condition) for each day in a grid format.
3. **Error Handling:**
    - Implement error handling for invalid city names or API request failures. Display user-friendly error messages like “City not found” or “API limit reached”. Use error handling where necessary.
4. **Optimize API Calls:**
    - Ensure that API calls are not repeated unnecessarily (e.g., avoid making multiple requests when input is unchanged).

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**Step 4: Filters:**

1. **Show temperatures in ascending order:** Use the sort() method to arrange the temperatures from lowest to highest.
2. **Filter out days without rain:** Use the filter() method to show only the entries where the weather condition includes rain.
3. **Show the day with the highest temperature:** Use the reduce() method to find the entry with the highest temperature.
4. **Show temperatures in descending order:** Use the sort() method to arrange the temperatures from highest to lowest.
5. **Show temperatures in ascending order:** Use the sort() method to arrange the temperatures from lowest to highest.

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**Step 5: Additional Features (Optional)**

- **Unit Conversion Toggle:**
  - Allow users to toggle between Celsius and Fahrenheit for temperature display.
- **Geolocation Support:**
  - Use the browser's geolocation API to detect the user's location and show weather information for that location by default.
- **Loading Spinner:**
  - Implement a loading spinner or progress bar while waiting for the API response.
- **CSS Animations:**
  - Add simple animations to make the interface more interactive (e.g., weather icons fading in).

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**Submission Requirements:**

1. A fully functioning weather dashboard with:
   - Current weather information
   - 5-day forecast
   - Proper error handling for invalid city names and API issues
2. A zip file containing:
   - HTML, CSS, and JavaScript files
   - A README file explaining the project and instructions to run it locally
3. Deploy the project using GitHub Pages (or any other preferred platform) and provide the live URL.

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**Evaluation Criteria:**

1. **API Integration (40%):**
    - Successful API requests and correct display of weather data.
2. **Frontend Development (30%):**
    - Layout design, responsiveness, and usability.
3. **JavaScript/jQuery Implementation (20%):**
    - Efficient use of AJAX, error handling, and dynamic DOM manipulation.
4. **Code Quality & Documentation (10%):**
    - Clean, well-documented code with a clear README file.