Web Design Assignment: Air Quality Monitoring Dashboard

Objective: Create a responsive web application to monitor and display real-time air quality data, including temperature, humidity, PM2.5, PM10, NOx, NH3, CO2, SO2, and VOC levels. The application will utilize HTML, CSS, and JavaScript.

Project Requirements

1. **User Interface Design**:
    - Develop a clean, intuitive layout for the dashboard.
    - Ensure responsiveness for both desktop and mobile devices.
    - Include the following sections:
        - **Header**: Title of the application and a brief description.
        - **Navigation Bar**: Links to sections like Home, Data, and About.
        - **Main Dashboard**: Central area displaying real-time data and visualizations.
        - **Footer**: Include copyright information and external resource links.
2. **Data Display**:
    - Use appropriate HTML elements to display the following data:
        - **Temperature** (°C)
        - **Humidity** (%)
        - **PM2.5** (µg/m³)
        - **PM10** (µg/m³)
        - **NOx** (ppb)
        - **NH3** (ppb)
        - **CO2** (ppm)
        - **SO2** (ppb)
        - **VOC** (ppb)
    - Organize these values in a user-friendly manner, using cards or tables.
3. **Visual Representation**:
    - Use JavaScript libraries like Chart.js or D3.js to create dynamic charts:
        - **Line Chart**: Visualize trends for temperature and humidity over time.
        - **Bar Charts**: Show levels of PM2.5, PM10, NOx, NH3, CO2, SO2, and VOC.
        - **Doughnut Chart**: Represent the distribution of various pollutants.
4. **Real-time Data Updates**:
    - Simulate with stored data in CSV format using different plots.
    - Simulate with real time JSON data using different plots
5. **Styling**:
    - Use CSS for styling and layout, possibly utilizing a CSS framework like Bootstrap for responsiveness.
    - Implement color coding to indicate air quality levels (e.g., green for good, yellow for moderate, red for unhealthy).
6. **Accessibility**:
    - Ensure adherence to web accessibility guidelines (e.g., semantic HTML, alt text for images).

    - Use clear fonts and sufficient color contrast for readability.

Deliverables

- **HTML Files**: Structure the web application using appropriate HTML5 elements.
- **CSS Files**: Style the application to enhance visual appeal and usability.
- **JavaScript Files**: Implement functionality for data fetching, chart rendering, and dynamic updates.
- **Documentation**: Provide a README file explaining how to run the application, the simulation process, and any libraries used.

Evaluation Criteria

- **Functionality**: The dashboard should update in real-time and function as intended.
- **Design**: The application should be visually appealing and easy to navigate.
- **Code Quality**: Code should be organized, well-commented, and follow best practices.
- **Responsiveness**: The application should adapt seamlessly to various devices and screen sizes.

Submission Instructions

- Submit a zip file containing all project files (HTML, CSS, JavaScript, images).
- Include a live demo link if possible (e.g., GitHub Pages, CodePen).

Feel free to use free APIs for this exercise.