IOT PHASE 4

AIR QUALITY MONITORING

PROJECT DEVELOPMENT PART 2

Building a project by developing Air Quality Monitoring platforms and mobile app using Html java script etc…

AIM:

The aim of creating an app for air quality monitoring using HTML, CSS, and JavaScript is to provide users with a convenient way to access and monitor real-time air quality information. This app will enable users to stay informed about their surrounding air quality and take necessary precautions if required.

ALGORITHM:

Here's a high-level algorithm for developing the app:

1. User Interface:

- Design and create the user interface using HTML and CSS.

- Include elements like maps, charts, and data visualizations to display air quality information effectively.

2. Data Integration:

- Research and choose reliable air quality data sources, such as APIs provided by government agencies or environmental organizations.

- Implement JavaScript code to fetch air quality data from the chosen API(s).

- Process and sanitize the data to extract relevant information like pollutant levels, air quality index, location, and timestamp.

3. Data Presentation and Visualization:

- Utilize JavaScript libraries or frameworks like Chart.js or D3.js to create visual representations of air quality data in the form of charts, graphs, or maps.

- Display the real-time or historical air quality information to the user in a visually appealing and easy-to-understand manner.

4. Location Services:

- Use JavaScript's Geolocation API or relevant plugins to retrieve the user's current location.

- Integrate the obtained location coordinates with air quality data requests to provide customized information based on the user's location.

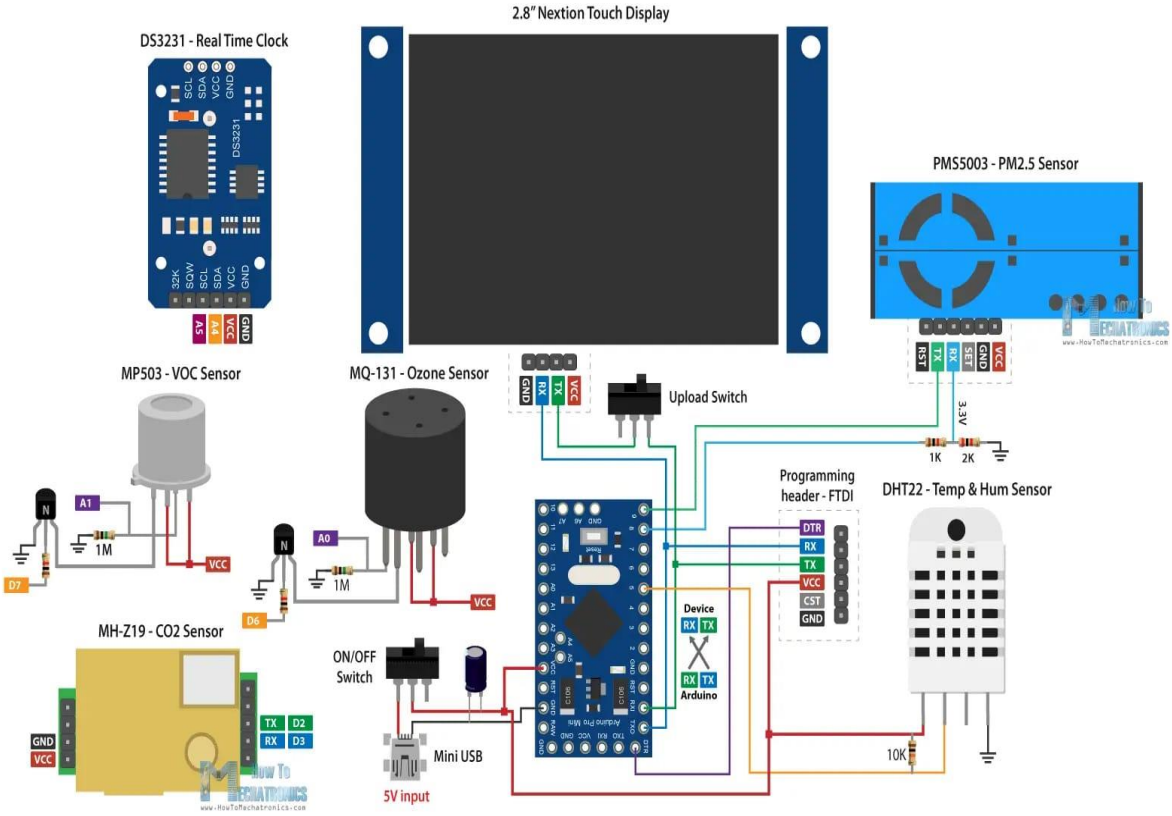
5. Notifications and Alerts:

- Implement push notifications or in-app alerts to inform users about significant changes in air quality, such as high pollution levels or health warnings.

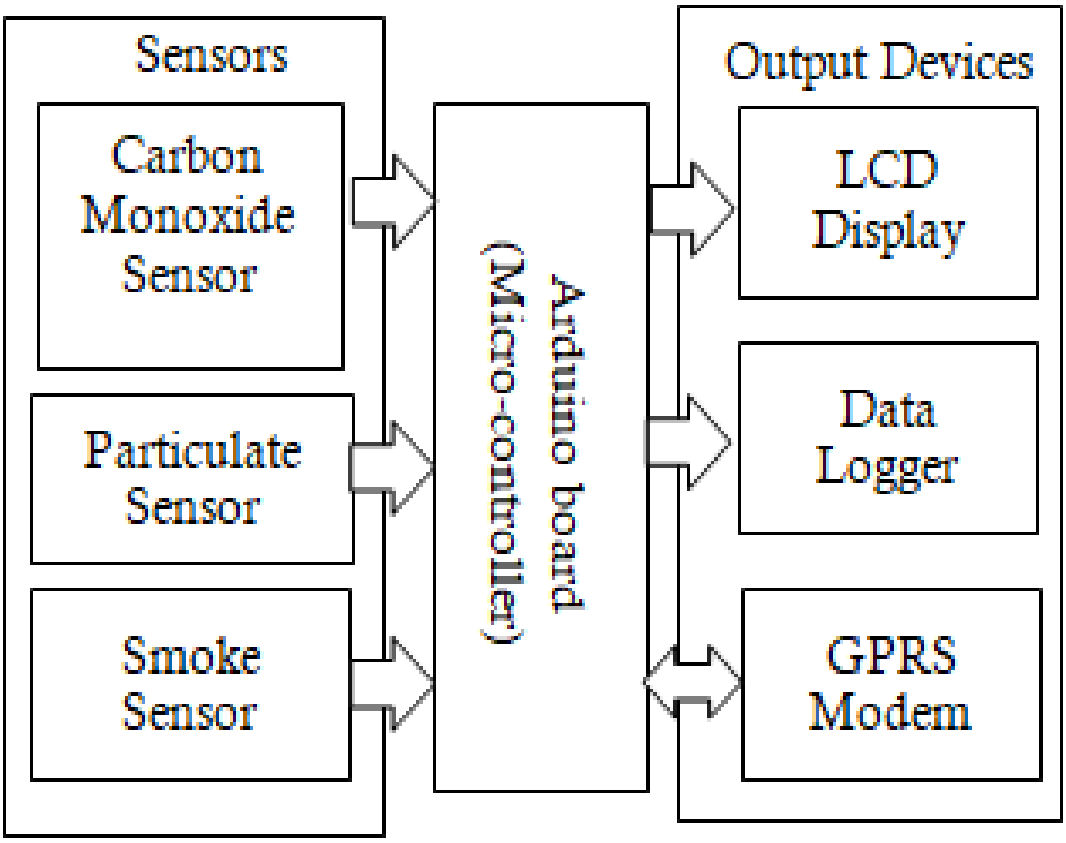
AIR QUALITY MONITORING NEEDS:

- Accurate sensors
- Real-time data processing
- Data logging
- Alerting system
- Remote access
- Calibration
- Data visualization
- Geospatial info

- Weather integration
- Networked sensors
- Power options
- Portability
- Data sharing
- AQI integration



BLOCK DIAGRAM:



DEVELOPMENT OF AN APP:

To create an Android platform that provides users with access to air quality monitoring, you can develop a mobile application using JavaScript, HTML, and CSS with a hybrid framework like Ionic or React Native. Here's a general outline of the development process:

1. Project Setup:

- Install the necessary software development kits (SDKs) and tools for Android app development.

- Set up a project in your preferred integrated development environment (IDE).

2. UI Design:

- Use HTML and CSS to design the user interface (UI) of the application.

- Consider incorporating elements like maps, charts, and data visualization to display air quality information effectively.

- Ensure the UI is intuitive, user-friendly, and responsive across different screen sizes.

3. Air Quality Data Integration:

- Research reliable air quality data sources, such as APIs provided by government agencies or environmental organizations.

- Implement JavaScript code to fetch air quality data from the chosen API(s).

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7. Testing and Deployment:

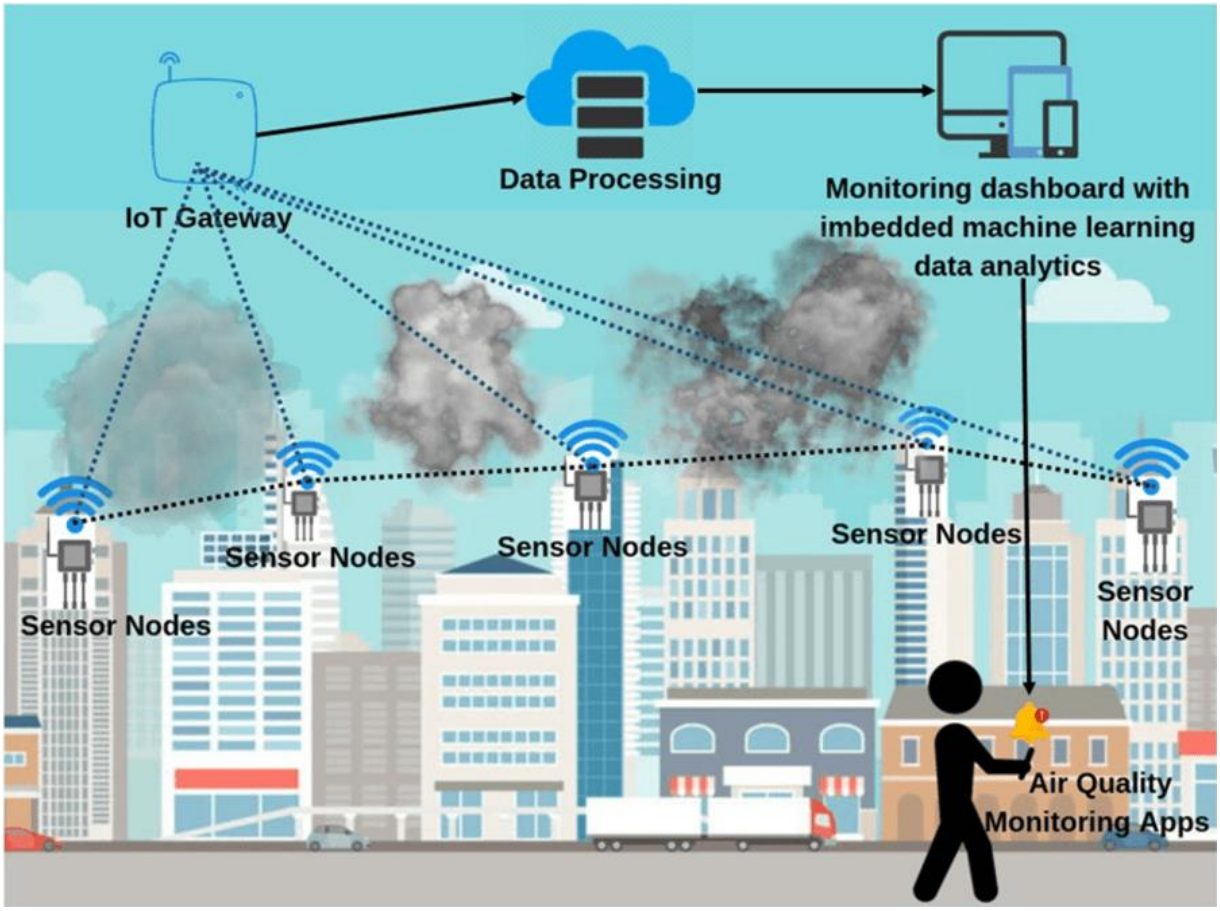
- Thoroughly test the application on various Android devices and emulator configurations to ensure functionality and compatibility.

- Sign the APK file and prepare it for deployment on the Google Play Store or other distribution platforms.

8. Continuous Maintenance:

- Regularly update the application to keep up with changes in air quality data sources, API updates, or user feedback.

- Address bug fixes, implement new features, and enhance the overall performance and user experience.



PROGRAM:(Using HTML, CSS, and JavaScript):

Here's a program using HTML, CSS, and JavaScript to create a simple app for checking the quality of air and keeping our environment dust -free so that every habitat can breathe free and can be aware of the quality of the air now a days.

HTML CODE:

Certainly! Here's an example of html code for creating an app for air quality monitoring:

```
<!DOCTYPE html>
<html lang="en">
<head>
```

```
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width,
initial-scale=1.0">
  <title>Air Quality Monitoring App</title>
  <link rel="stylesheet" href="styles.css">
</head>
<body>
  <header>
    <h1>Air Quality Monitoring App</h1>
  </header>

  <section id="mapSection">
    <div id="map"></div>
  </section>

  <section id="dataSection">
    <h2>Air Quality Information</h2>
    <ul id="dataList"></ul>
  </section>

  <script src="script.js"></script>
</body>
</html>
```

CSS (styles.css):

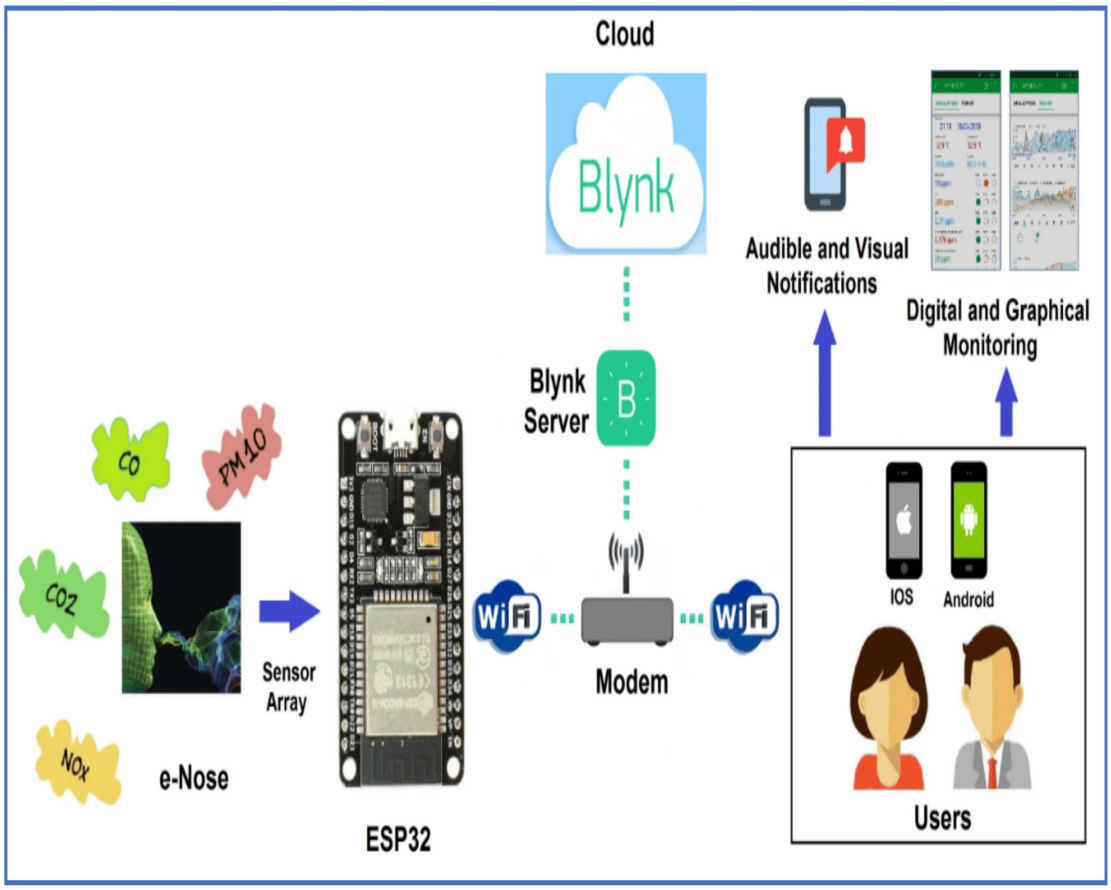
```
css
/* Add your styles here */
body {
  font-family: Arial, sans-serif;
}

header {
  background-color: #333;
  color: #fff;
  padding: 20px;
}

#map {
  width: 100%;
  height: 400px;
}

#dataList {
  list-style-type: none;
  padding: 0;
  margin: 0;
}
#dataList li {
  padding: 10px;
```

```
  border-bottom: 1px solid #ccc;
}
#dataList li:last-child {
  border-bottom: none;}
```



JavaScript (script.js):

```
// Sample data for demonstration purposes
const airQualityData = [
  { city: 'New York', aqi: 52 },
  { city: 'London', aqi: 40 },
  { city: 'Beijing', aqi: 168 },
  { city: 'Tokyo', aqi: 32 }
```

```
];

// Function to render the air quality data
function renderAirQualityData() {
  const dataList = document.getElementById('dataList');

  airQualityData.forEach(data => {
    const listItem = document.createElement('li');
    listItem.innerHTML = `${data.city}: ${data.aqi}`;
    dataList.appendChild(listItem);
  });
}

// Initialize the map and render air quality data on page load
window.addEventListener('load', () => {
  // Code to initialize and display the map goes here
  // ...

  renderAirQualityData();
});
```

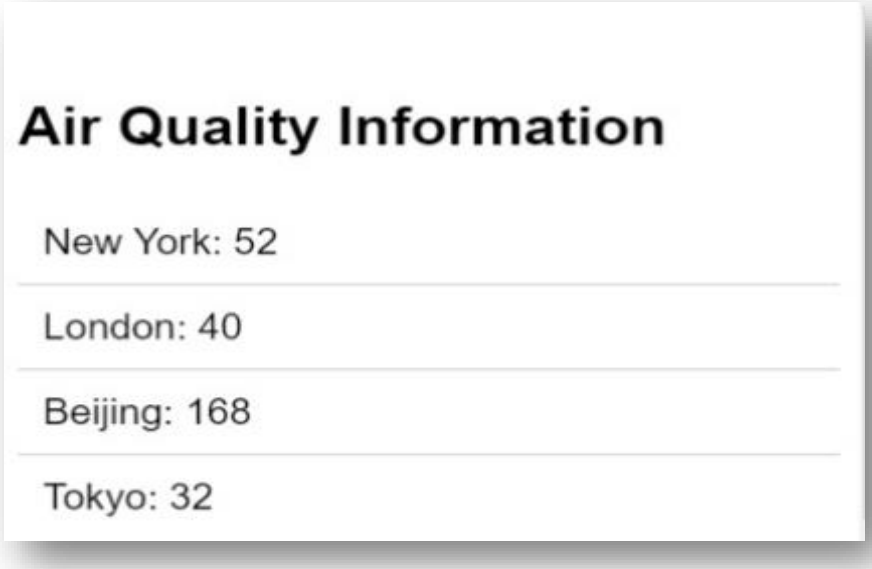
EXPLANATION OF CODE:

In the above code, we have the HTML structure for the app as explained before. We also have some basic CSS styles to make it visually appealing.

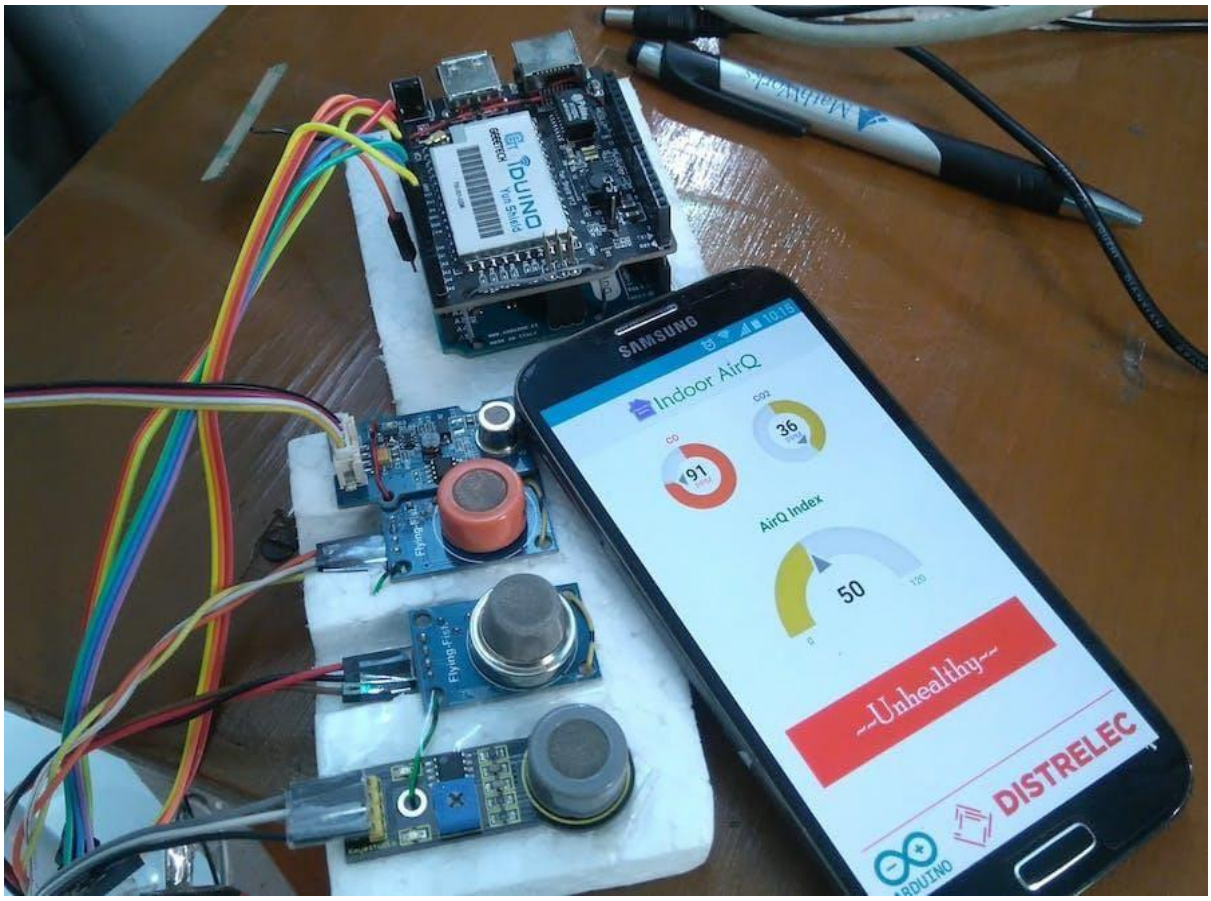
The JavaScript code includes a sample data array (`airQualityData`) for demonstration purposes. You can replace it with actual data from an API or any other source. The `renderAirQualityData()` function dynamically generates a list of air quality data based on the provided array.

Please make sure to include appropriate links to the CSS and JavaScript files in your HTML file

OUTPUT:



SAMPLE OUTPUT:



AIR QUALITY MONITOR NEEDS:

1. Environmental protection
2. Public health
3. Industrial compliance
4. Traffic management
5. Agriculture
6. Indoor air quality
7. Research
8. Emergency response

9. Smart cities
10. Weather forecasting
11. Emission reduction
12. Real estate choices
13. Asthma and allergy management
14. Energy efficiency

FEATURES:

- Real-time air quality information
- Customized data based on user location
- Data visualization with charts, graphs, or maps
- Push notifications or in-app alerts for important air quality updates

ADVANTAGES:

- Provides users with easy access to real-time air quality information
- Helps users make informed decisions about outdoor activities and health precautions
- Raises awareness about air pollution and its impact on health
- Encourages individuals to take steps towards reducing pollution and improving air quality

DISADVANTAGES:

- Reliance on third-party air quality data sources, which may not always be completely accurate or up-to-date

- May require a stable internet connection to fetch and update air quality data
- Limited functionality compared to specialized air quality monitoring devices or official monitoring systems

CONCLUSION:

It's important to note that the actual program implementation might involve more detailed coding examples and specific libraries, APIs, or frameworks depending on your requirements and chosen development approach.