COLLEGE NAME: PRIYADARSHINI ENGINEERING COLLEGE

COLLEGE CODE : 5119

COURSE NAME: Internet Of Things (IOT)

GROUP NUMBER: 2

PROJECT TITLE: PUBLIC TRANSPORTATION OPTIMIZATION.

PROJECT SUBMITTED TO: SKILL UP ONLINE

YEAR: 3rd

DEPARTMENT: ELECTRONICS AND COMMUNICATION ENGINEERING.

SEMESTER: 5th

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Design :

Web-based Dashboard for Administrators:

A web-based dashboard for administrators is a user-friendly online tool that shows important data and metrics in an easy-to-read format. It helps administrators make quick decisions by providing real-time updates, customizable displays, and alerts for key information.

Data Collection and Transmission:

IoT sensors continuously collect data.

Data is transmitted to a central server or cloud platform in real-time.

Web Development:

Create a web-based platform for students, mimicking the real-world application.

Use a combination of HTML, CSS, and JavaScript to build the web user interface.

User Interfaces:

Develop simple web pages with intuitive interfaces that students can interact with.

Use HTML forms and JavaScript for data input and display.

Data Visualization:

Implement basic data visualization using JavaScript libraries like Chart.js to show simulated data trends.

Alerts and Notifications:

Simulate alerting and notification mechanisms within the web application.

User Authentication and Security:

For a basic student project, you can skip user authentication, but implement basic security practices for data handling.

Database Management:

Use a simplified database or data storage system (e.g., local storage) to mimic data storage.

Testing and Quality Assurance:

Ensure that the web application is bug-free and functions as expected for the student project.

Data Visualization and Reporting:

Create a dashboard that displays real-time data, route maps, and vehicle conditions for transportation authorities.

Generate reports for operational decision-making.

Connecting Mobile app with Public Transport Optimization:

- Connecting a mobile app to a Public Transport Optimization IoT project involves setting up a communication pathway between the mobile app and the IoT devices or backend server. Here's a high-level overview of the steps to achieve this connection:

1.Define App Requirements:

Determine the specific functionalities and features you want to offer in the mobile app. These could include real-time tracking, route information, alerts, and notifications.

2.Choose Development Platforms:

Decide whether you want to develop native apps for specific platforms (e.g., iOS and Android) or use cross-platform frameworks like React Native, Flutter, or Xamarin to build the app for multiple platforms simultaneously.

3.Select Development Tools:

Choose the development tools and integrated development environments (IDEs) suitable for the selected platform and framework.

4.Develop Mobile App:

Create the mobile app using the chosen platform and development tools. Integrate user interfaces, real-time tracking, and any other relevant features.

5.Implement Communication:

To connect the app with IoT devices or the backend server:

1.APIs: Develop RESTful or WebSocket APIs on the backend server to expose data and functionality to the app.

2.Mobile App Client: Implement communication within the app using libraries like fetch (for HTTP requests), WebSockets, or specialized IoT communication protocols (e.g., MQTT).

6.Authentication and Security:

Implement user authentication mechanisms to ensure secure access to the app.

Ensure data security by using encryption and authentication methods, especially when dealing with sensitive data.

7.Real-Time Data Retrieval:

Enable the app to request and display real-time data from the IoT devices, such as vehicle location, passenger count, and alerts.

8.User-Friendly Interfaces:

Create user-friendly interfaces within the app to display real-time information and allow users to interact with the Public Transport Optimization system.

9.Push Notifications:

Implement push notification services to send real-time alerts and updates to the mobile app users. This could be for service delays, route changes, or other relevant information.

10.Testing:

Thoroughly test the app's functionality, performance, and user experience to ensure it works seamlessly with the IoT system.

11.Deployment:

Deploy the mobile app to app stores (e.g., Apple App Store, Google Play Store) for public or limited access.

12.Maintenance and Updates:

Continuously monitor the app's performance and user feedback. Address issues, release updates, and add new features as needed.

Python Code for Connecting Mobile app with Above Project:

```
import 'package:flutter/material.dart';

import 'package:http/http.dart' as http;

import 'dart:convert';

void main() => runApp(MyApp());
```

```dart
class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: VehicleLocations(),
    );
  }
}

class VehicleLocations extends StatefulWidget {
  @override
  _VehicleLocationsState createState() =>
_VehicleLocationsState();
}

class _VehicleLocationsState extends State<VehicleLocations> {
  String locationData = "";

  Future<void> fetchVehicleLocations() async {
    final response = await http.get('http://your-python-server-
url/get_vehicle_location?vehicle_id=bus1');

    if (response.statusCode == 200) {
      setState(() {
```

```dart
      locationData = json.decode(response.body).toString();
    });
  }
}
@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
      title: Text('Public Transport Optimization App'),
    ),
    body: Center(
      child: Column(
        children: <Widget>[
          ElevatedButton(
            onPressed: fetchVehicleLocations,
            child: Text('Get Vehicle Location'),
          ),
          Text(locationData),
        ],
      ),
```

```
      ),
    );
  }
}
```

CIRCUIT DIAGRAM FOR PUBLIC TRANSPORTATION OPTIMIZATION :
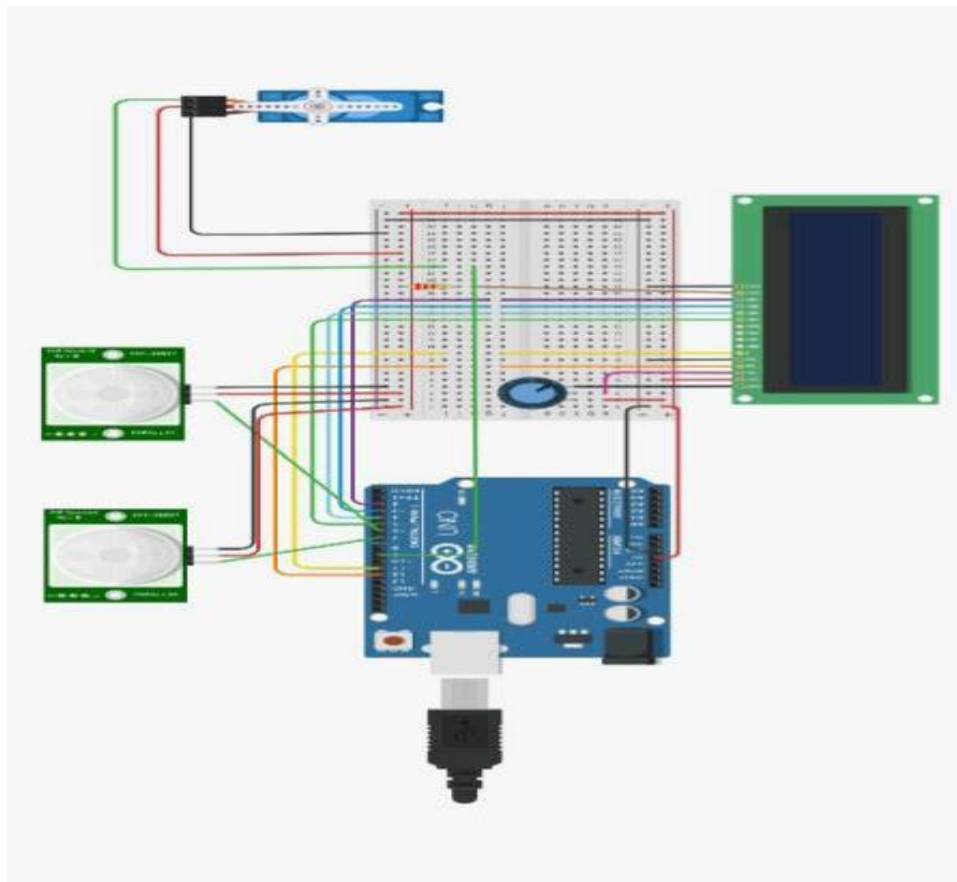
3D REPRESENTATION FOR PUBLIC TRANSPORTATION OPTIMIZATION :