PUBLIC TRANSPORT OPTIMIZATION

PROJECT OBJECTIVE:

The project aims to create a real-time transit information system that provides up-to-date information about a specific transit station, such as location, current ridership, and estimated arrival times. The primary objectives of this project are to enhance the passenger experience and improve public transportation services by offering accurate, real-time data to travelers.

IOT SENSOR DEPLOYMENT:

IoT (Internet of Things) sensors can be strategically deployed at the transit station to collect data.

THESE SENSORS COULD INCLUDE:

1. PASSENGER COUNTING SENSORS:

These sensors can use methods like infrared sensors, cameras, or weight sensors to count the number of passengers entering and exiting the station.

2. ARRIVAL TIME PREDICTION SENSORS:

These sensors can monitor the transit vehicles' locations and use GPS data to predict arrival times more accurately.

3. ENVIRONMENTAL SENSORS:

To monitor factors like temperature, humidity, and air quality, which can impact the passenger experience.

PLATFORM DEVELOPMENT:

The platform development involves creating a back-end system and database to receive, process, and store data from the IoT sensors. This platform is build with HTML,CSS,JAVASCRIPT to store the collected data. The platform should also have APIs for data retrieval and front-end integration.

CODE IMPLEMENTATION:

1. HTML STRUCTURE (INDEX.HTML):

The index.html file serves as the entry point for the application.

Code explanation:

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

```
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Real-Time Transit Information</title>
    <link rel="stylesheet" href="styles.css">
</head>
<body>
    <header>
        <h1>Real-Time Transit Information</h1>
    </header>
    <section id="data-display">
        <p>Loading real-time data...</p>
    </section>
    <script src="script.js"></script>
</body>
</html>
```

JAVASCRIPT LOGIC (SCRIPT.JS):

The script.js file contains JavaScript code that simulates real-time data updates.

Code explanation:

```
const dataDisplay = document.getElementById('data-display');
function updateData() {
    const location = 'Station A';
    const ridership = Math.floor(Math.random() * 100);
    const arrivalTime = (Math.random() * 30).toFixed(1);
    const data = `
        <p>Location: ${location}</p>
        <p>Ridership: ${ridership} passengers</p>
        <p>Estimated Arrival Time: ${arrivalTime} minutes</p>
    `;
    dataDisplay.innerHTML = data;
}

// Update data every 10 seconds (simulating real-time updates)updateData();
setInterval(updateData, 10000);
```

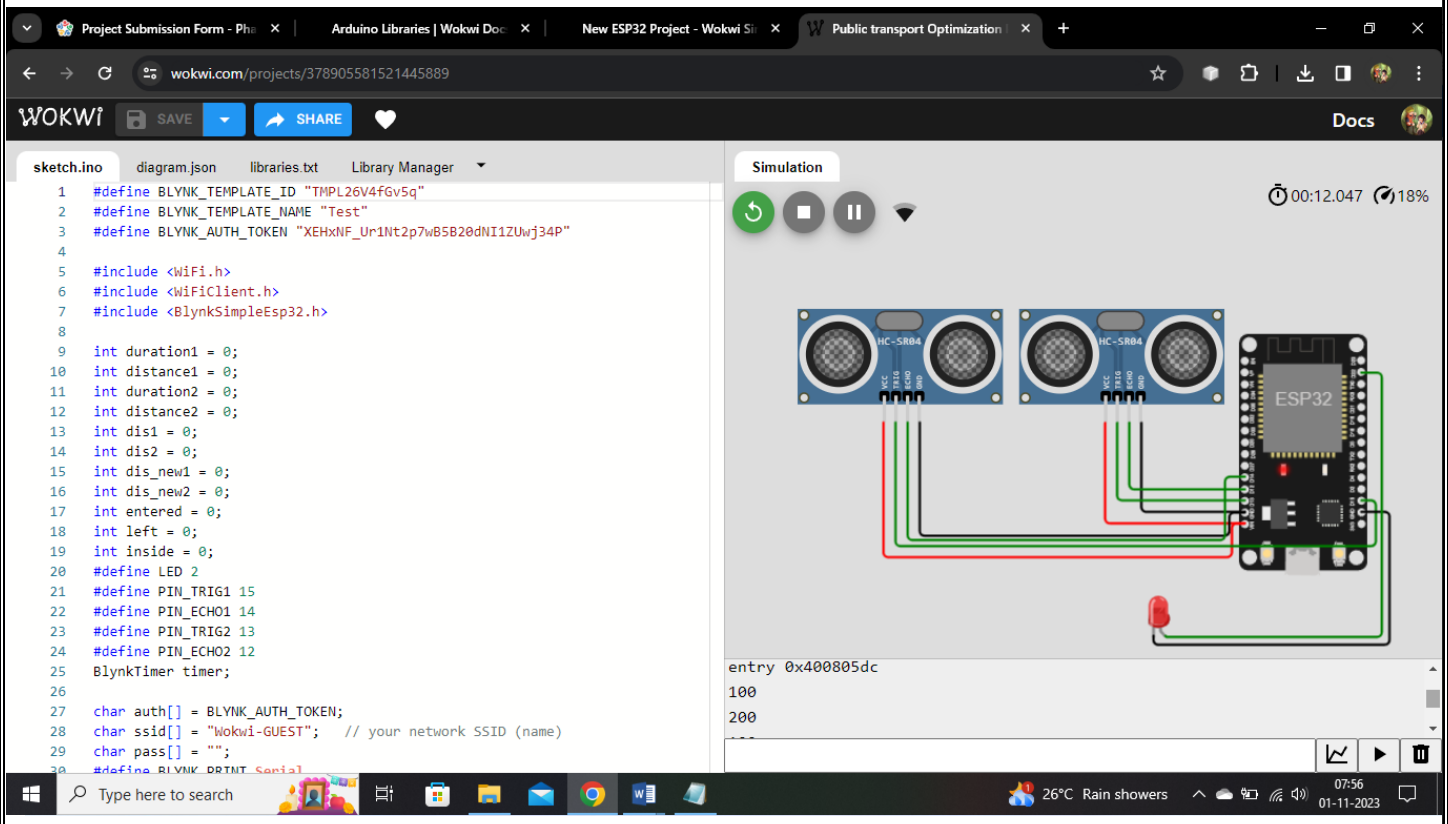
CSS STYLING (STYLES.CSS):

The styles.css file provides styling for the webpage.

Code explanation:

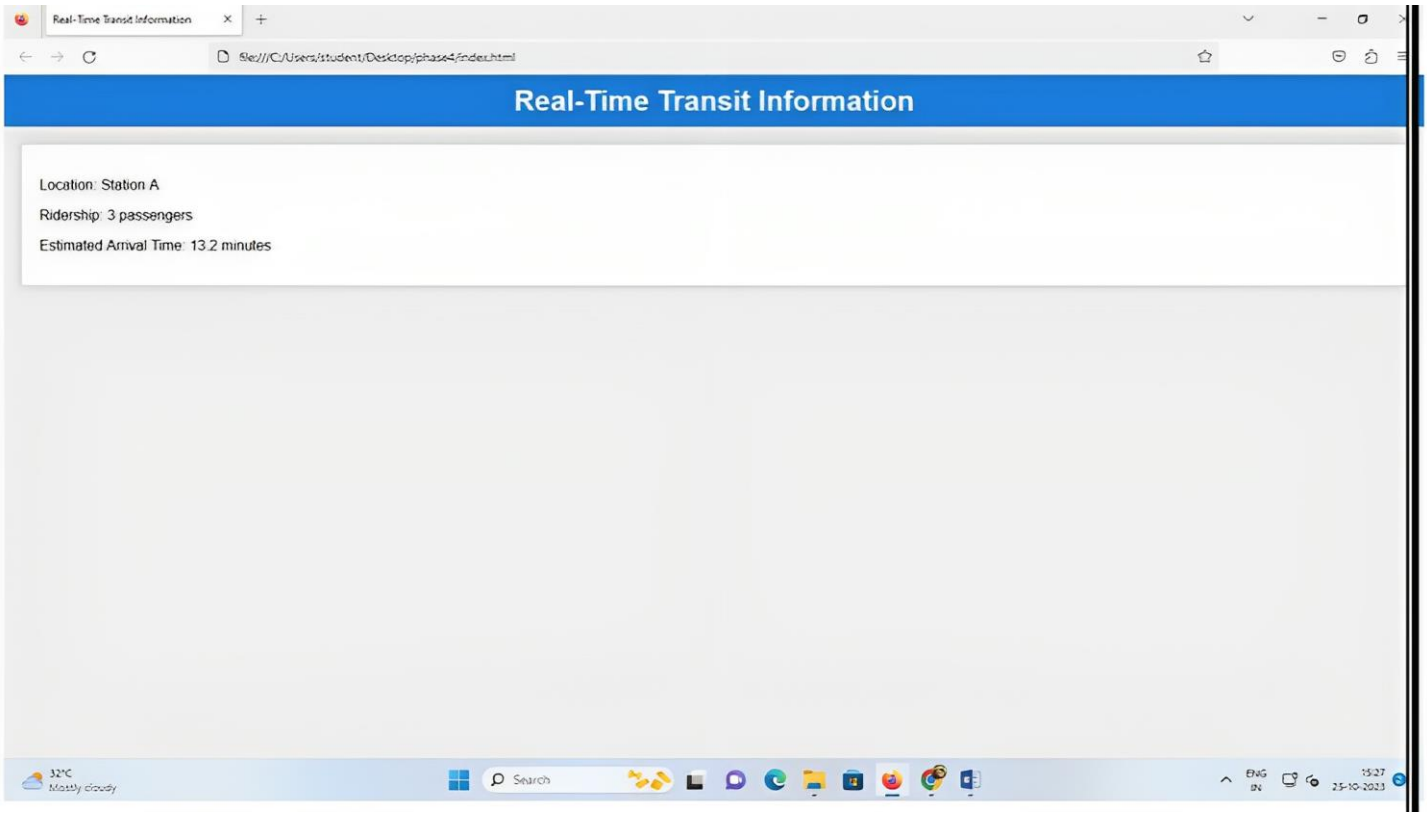
```
body {
    font-family: Arial, sans-serif;
    background-color: #f0f0f0;
    margin: 0;
    padding: 0;
}
header {
    background-color: #0074D9;
    color: #fff;
    text-align: center;
    padding: 10px;
}
h1 {
    margin: 0;
}
#data-display {
    background-color: #fff;
    padding: 20px;
    margin: 20px;
    border-radius: 5px;
    box-shadow: 0 0 10px rgba(0, 0, 0, 0.2)
```

HERE IS A DIAGRAM OF THE SYSTEM:



OUTPUT:

This is the final output of the system(REAL TIME DATA DISPLAY).



BENEFITS OF REAL-TIME TRANSIT INFORMATION:

1.Improved Passenger Experience:

Passengers can access accurate real-time information about the transit station, making it easier for them to plan their trips and reduce waiting times.

2. Increased Ridership:

A user-friendly real-time information system can attract more passengers to use public transportation, contributing to reduced traffic congestion and environmental benefits.

3. Enhanced Safety:

Environmental sensors can provide data on air quality and other factors, helping passengers make informed decisions about their well-being.

4.Operational Efficiency:

Transit operators can use real-time data to optimize schedules, allocate resources more efficiently, and respond to incidents promptly.

5.Data-Driven Decision Making:

The collected data can be analyzed to identify trends, bottlenecks, and areas for improvement, leading to better long-term planning and investment decisions.

6.Sustainability:

By encouraging the use of public transit and reducing congestion, the system can contribute to sustainability and reduced carbon emissions.

CONCLUSION:

Incorporating IoT sensors and a more advanced back-end platform can further enhance the capabilities of the system and provide more comprehensive data to improve public transportation services and the passenger experience.