AI ASSISTED CODING LAB TEST 3

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Batch: 19

TASK 1

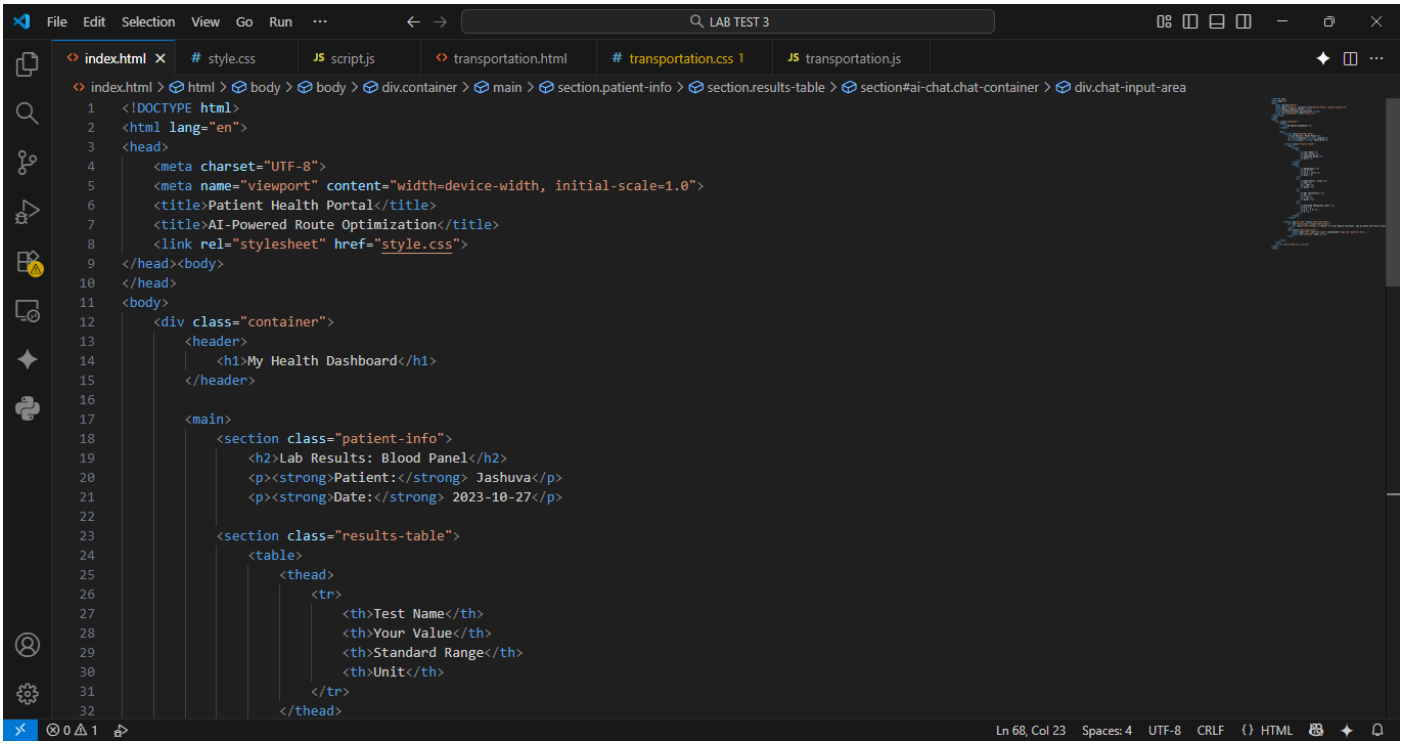
Scenario: In the domain of Healthcare, a company is facing a challenge related to web
frontend development.
Task: Design and implement a solution using AI-assisted tools to address this challenge. Include code, explanation of AI integration, and test results.
Deliverables: Source code, explanation, and output screenshots

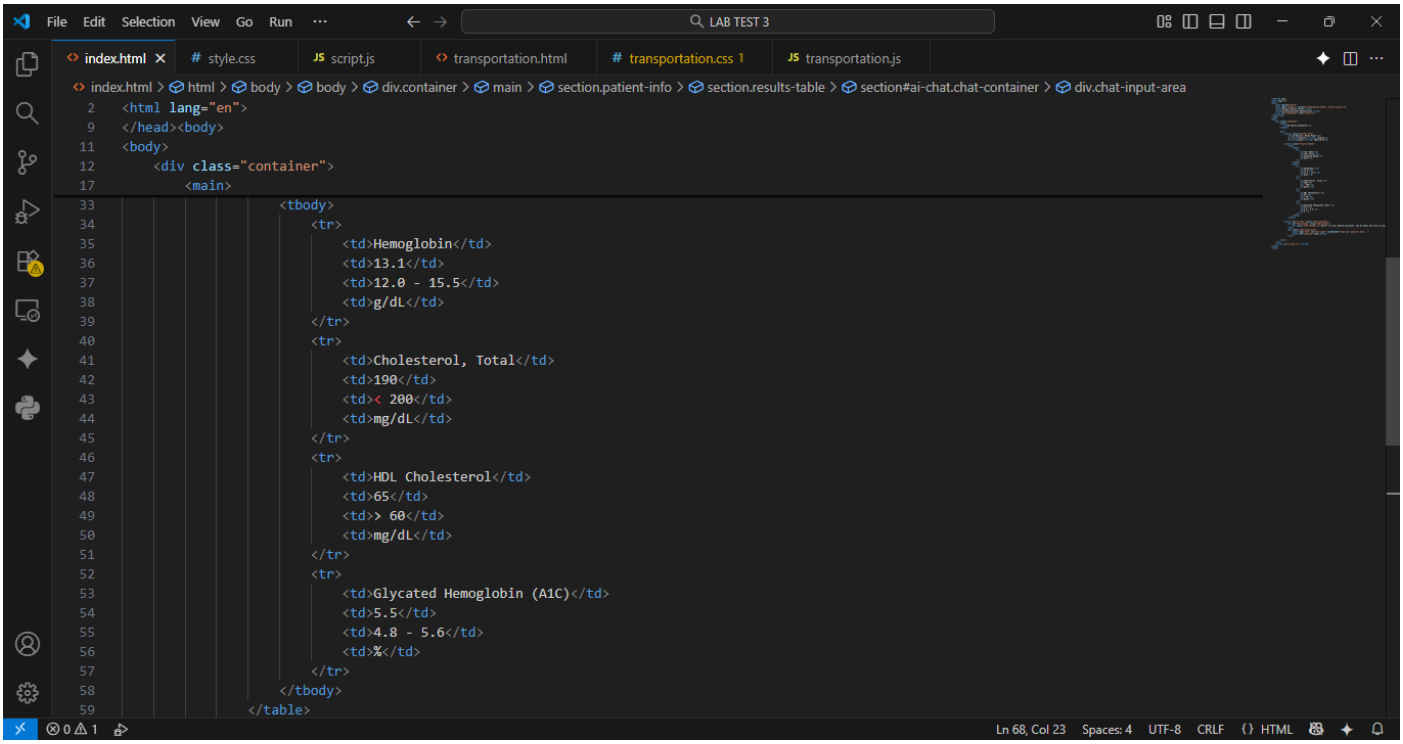
PROMPT:

A healthcare company wants to create a simple web page to show patient health data like heart rate, temperature, and oxygen level. The goal is to quickly build this webpage using AI tools (like ChatGPT or GitHub Copilot) to help write the frontend code. The page should look clean, work on mobile devices, and show live or sample data using charts.

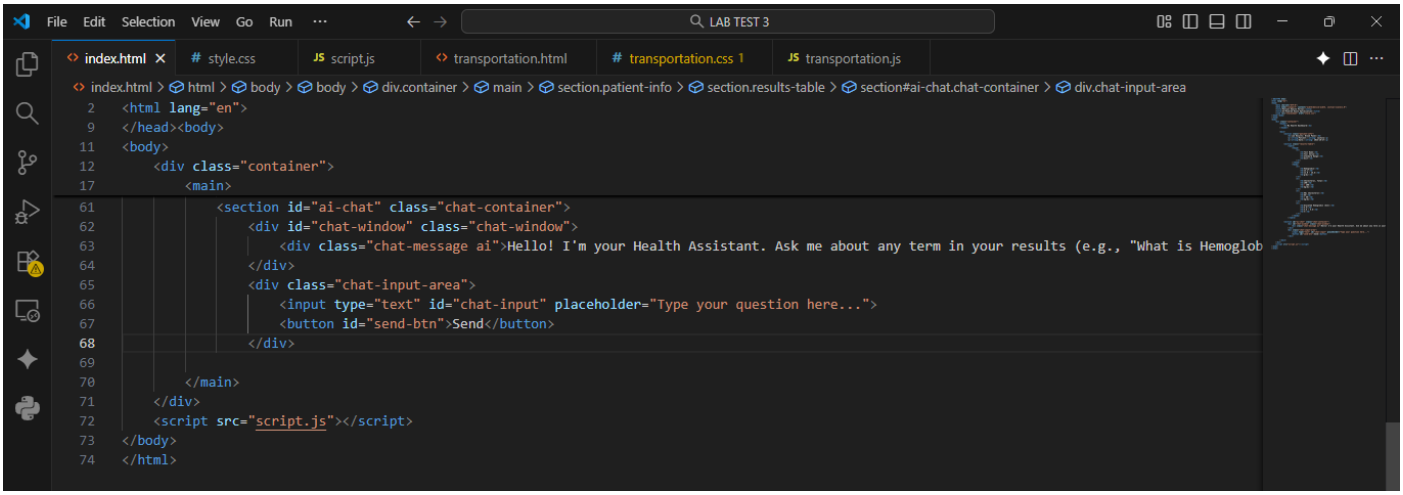
CODE:

HTML




File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
index.html > html > body > body > div.container > main > section.patient-info > section.results-table > section#ai-chat.chat-container > div.chat-input-area
<html lang="en">
</head><body>
<body>

<main>
<tbody>
<tr>
<td>Hemoglobin</td>
<td>13.1</td>
<td>12.0 - 15.5</td>
<td>g/dL</td>
</tr>
<tr>
<td>Cholesterol, Total</td>
<td>190</td>
<td>< 200</td>
<td>mg/dL</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>65</td>
<td>> 60</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Glycated Hemoglobin (A1C)</td>
<td>5.5</td>
<td>4.8 - 5.6</td>
<td>%</td>
</tr>
</tbody>
</table>
Ln 68, Col 23 Spaces: 4 UTF-8 CRLF HTML


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
index.html > html > body > body > div.container > main > section.patient-info > section.results-table > section#ai-chat.chat-container > div.chat-input-area
<html lang="en">
</head><body>
<body>

<main>
<section id="ai-chat" class="chat-container">

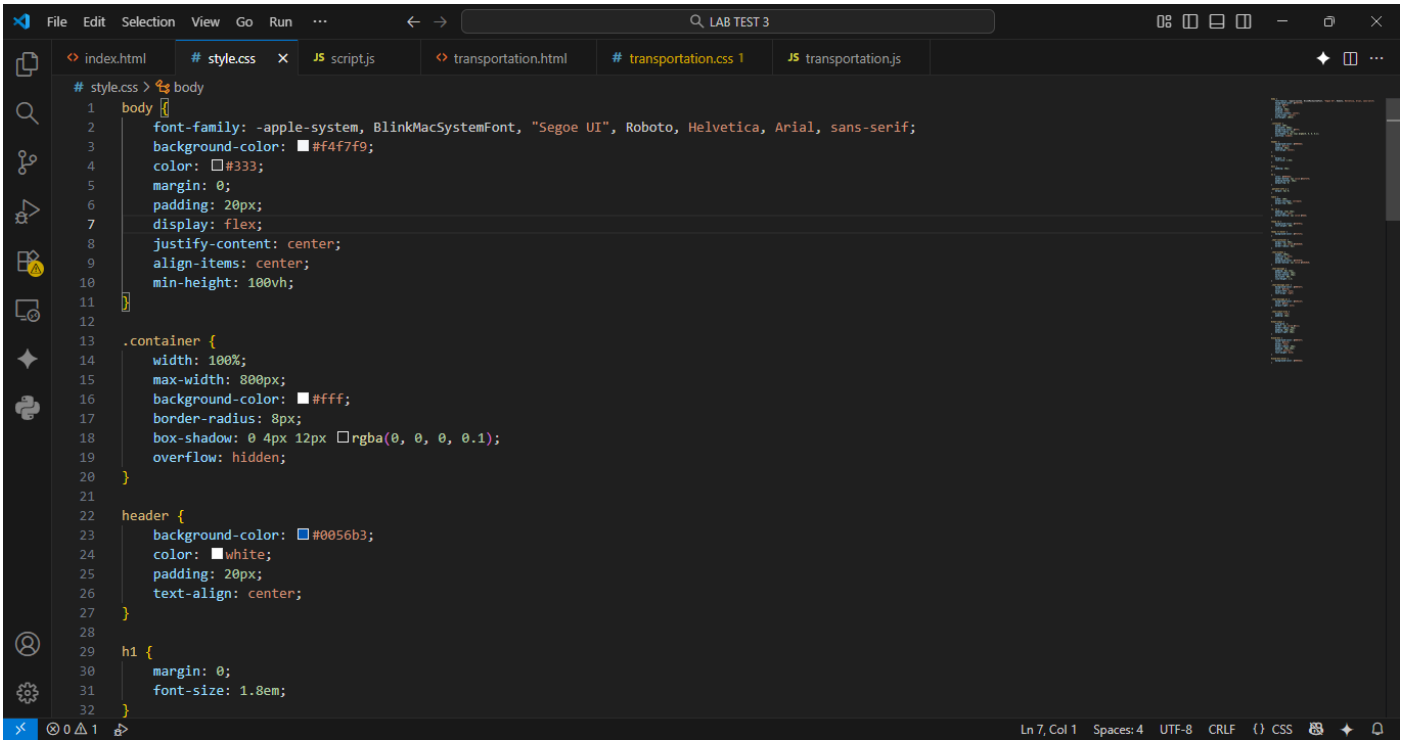
Hello! I'm your Health Assistant. Ask me about any term in your results (e.g., "What is Hemoglob

<input type="text" id="chat-input" placeholder="Type your question here...">
<button id="send-btn">Send</button>

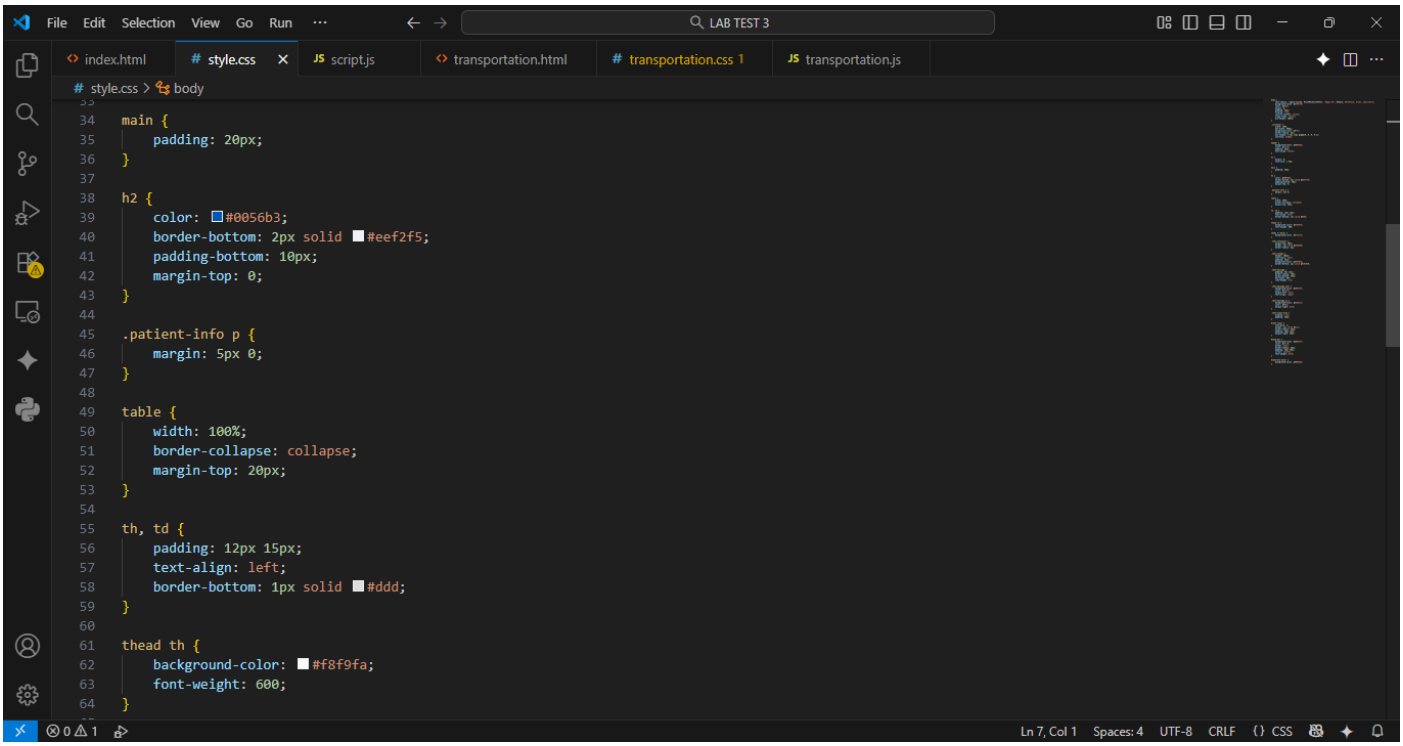
</main>

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

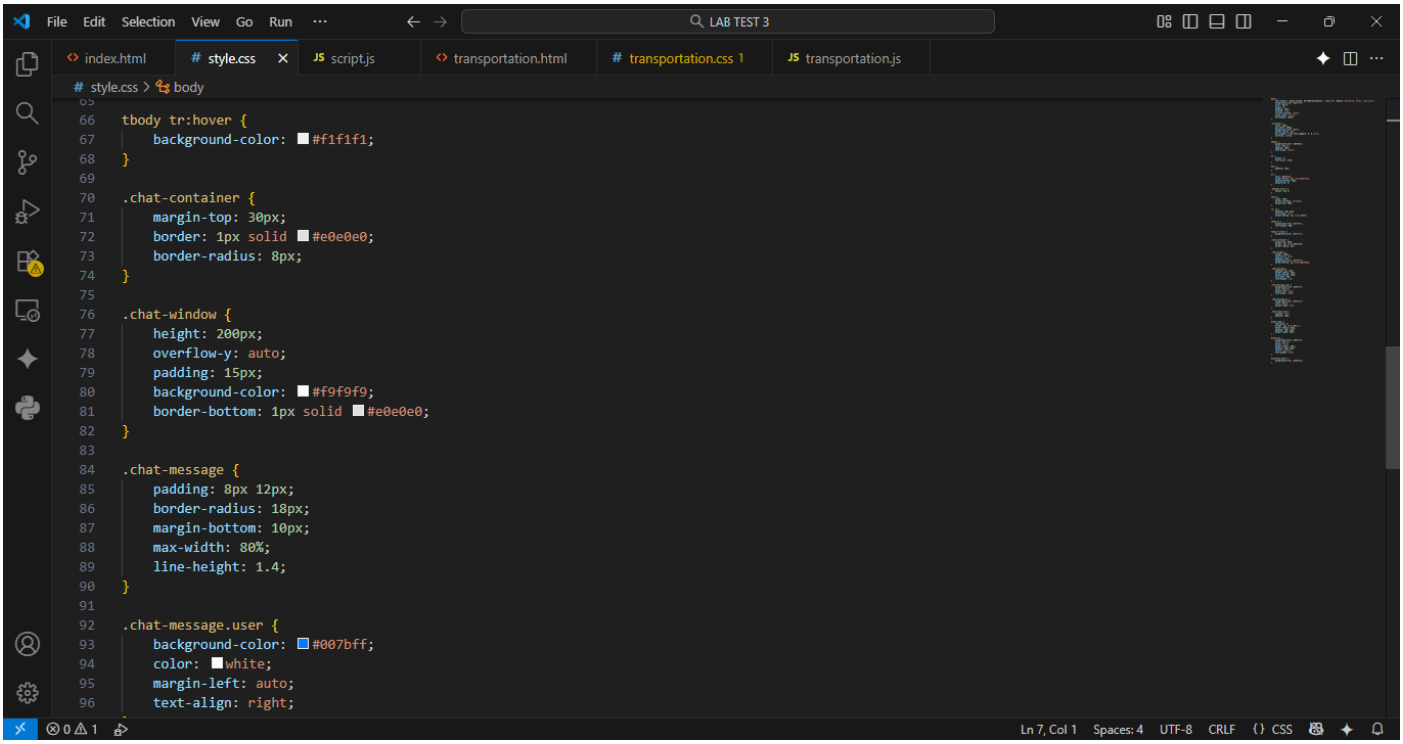
CSS:

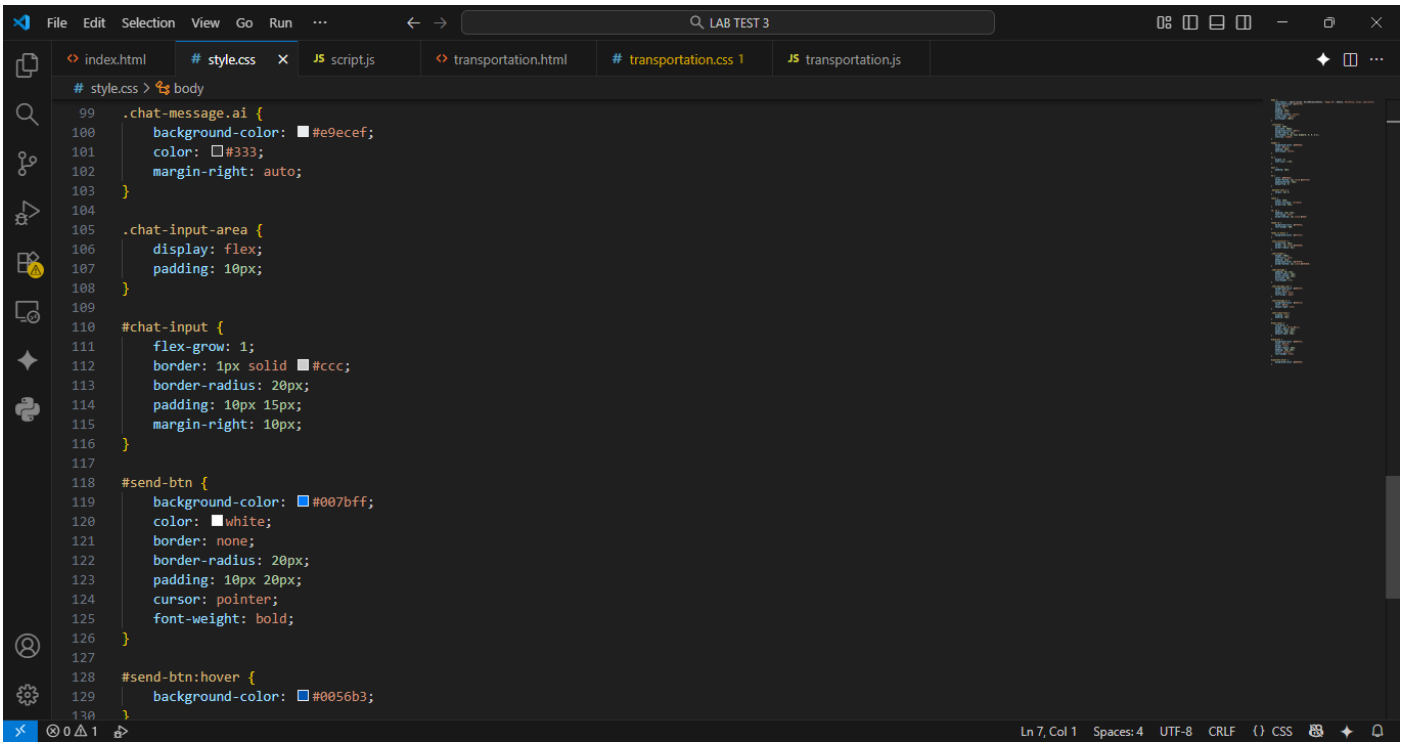



```css
body {
    font-family: -apple-system, BlinkMacSystemFont, "Segoe UI", Roboto, Helvetica, Arial, sans-serif;
    background-color: #f4f7f9;
    color: #333;
    margin: 0;
    padding: 20px;
    display: flex;
    justify-content: center;
    align-items: center;
    min-height: 100vh;
}

.container {
    width: 100%;
    max-width: 800px;
    background-color: #fff;
    border-radius: 8px;
    box-shadow: 0 4px 12px rgba(0, 0, 0, 0.1);
    overflow: hidden;
}

header {
    background-color: #0056b3;
    color: white;
    padding: 20px;
    text-align: center;
}

h1 {
    margin: 0;
    font-size: 1.8em;
}
```

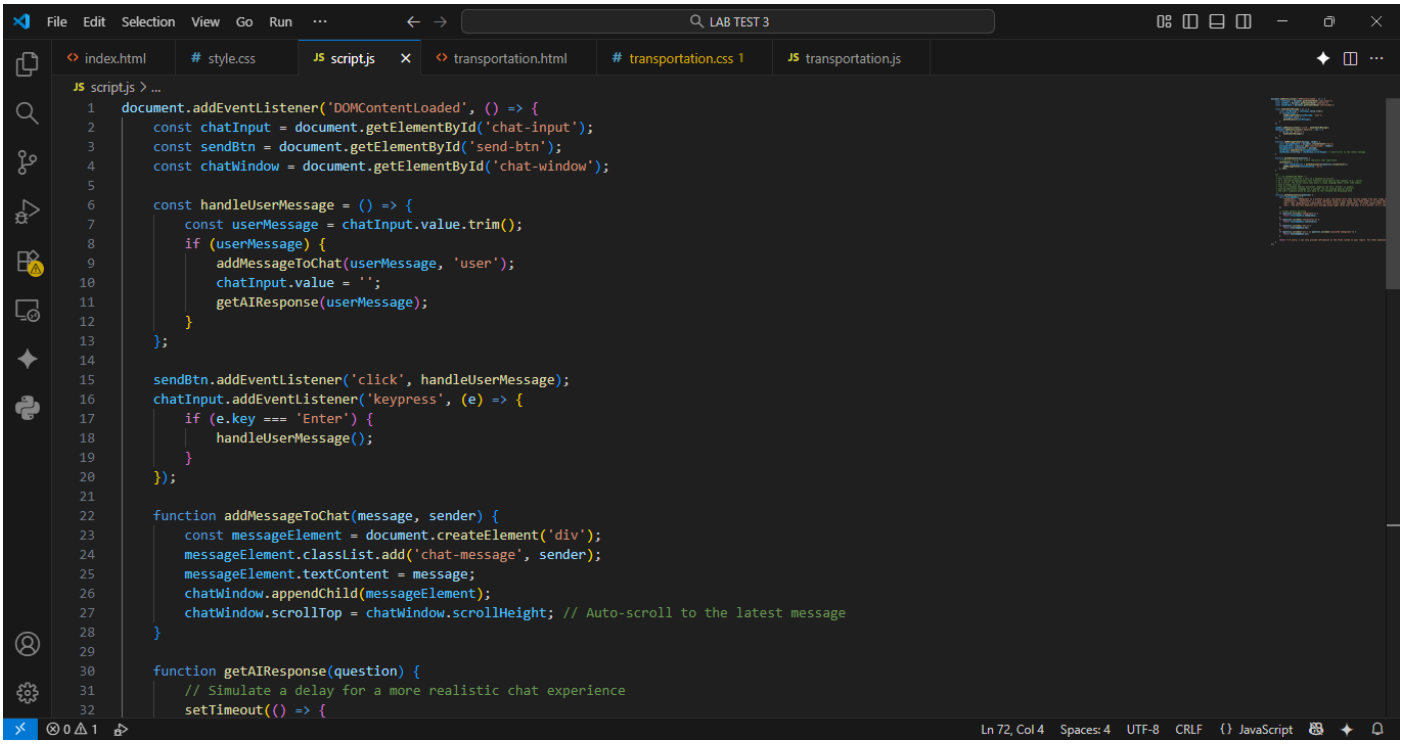


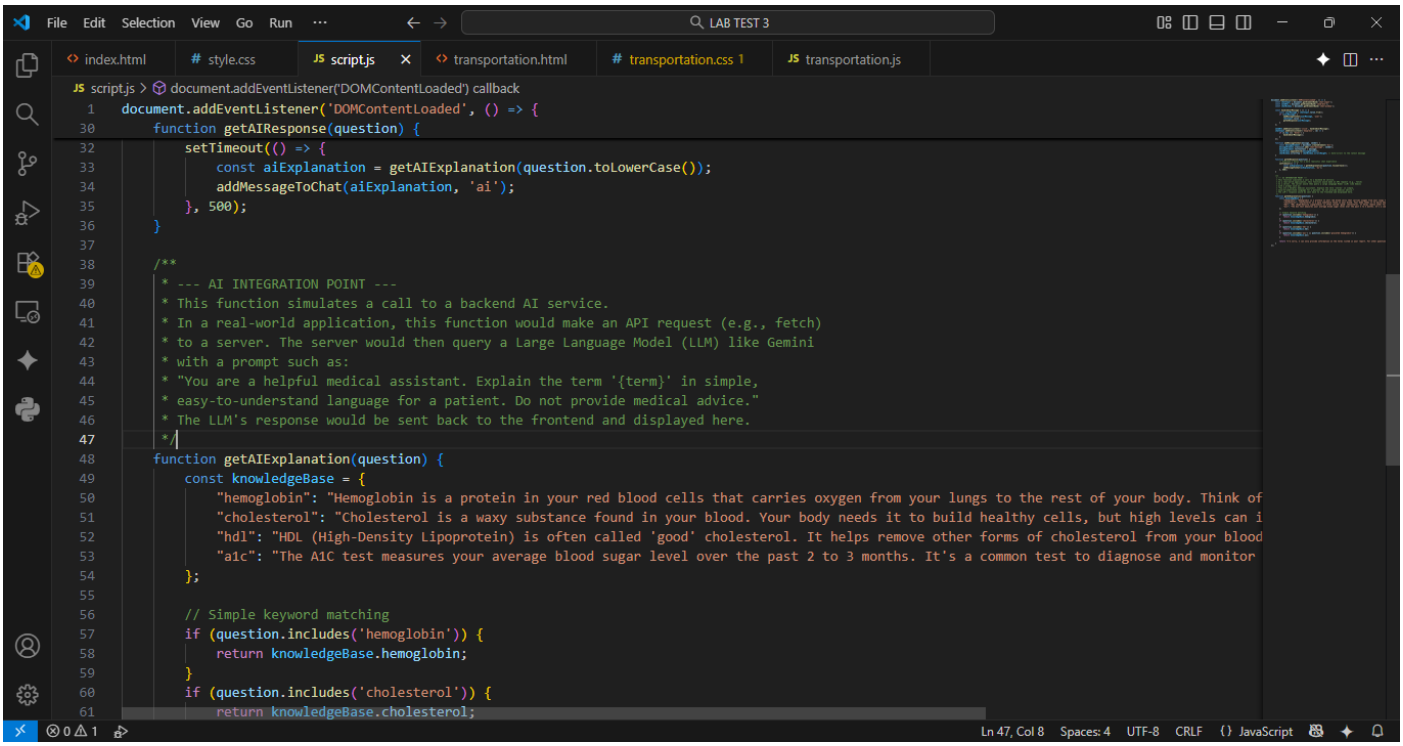

```css
main {
    padding: 20px;
}

h2 {
    color: #0056b3;
    border-bottom: 2px solid #eef2f5;
    padding-bottom: 10px;
    margin-top: 0;
}

.patient-info p {
    margin: 5px 0;
}

table {
    width: 100%;
    border-collapse: collapse;
    margin-top: 20px;
}

th, td {
    padding: 12px 15px;
    text-align: left;
    border-bottom: 1px solid #ddd;
}

thead th {
    background-color: #f8f9fa;
    font-weight: 600;
}
```



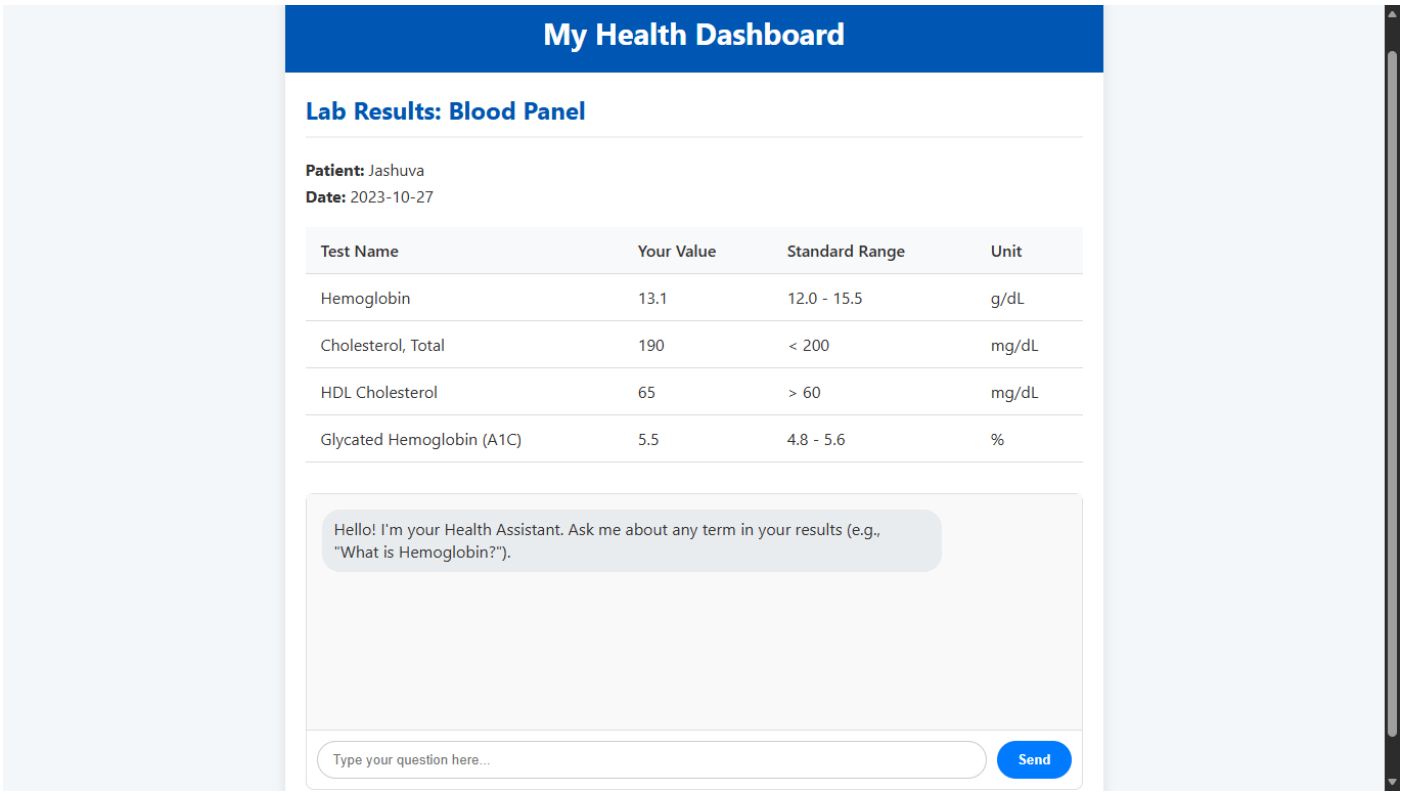


JAVA SCRIPT (JS):


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
script.js > ...
document.addEventListener('DOMContentLoaded', () => {
const chatInput = document.getElementById('chat-input');
const sendBtn = document.getElementById('send-btn');
const chatWindow = document.getElementById('chat-window');
const handleUserMessage = () => {
const userMessage = chatInput.value.trim();
if (userMessage) {
addMessageToChat(userMessage, 'user');
chatInput.value = '';
getAIResponse(userMessage);
}
};
sendBtn.addEventListener('click', handleUserMessage);
chatInput.addEventListener('keypress', (e) => {
if (e.key === 'Enter') {
handleUserMessage();
}
});
function addMessageToChat(message, sender) {
const messageElement = document.createElement('div');
messageElement.classList.add('chat-message', sender);
messageElement.textContent = message;
chatWindow.appendChild(messageElement);
chatWindow.scrollTop = chatWindow.scrollHeight; // Auto-scroll to the latest message
}
function getAIResponse(question) {
// Simulate a delay for a more realistic chat experience
setTimeout(() => {
Ln 72, Col 4 Spaces: 4 UTF-8 CRLF JavaScript


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
script.js > document.addEventListener('DOMContentLoaded') callback
document.addEventListener('DOMContentLoaded', () => {
function getAIResponse(question) {
setTimeout(() => {
const aiExplanation = getAIExplanation(question.toLowerCase());
addMessageToChat(aiExplanation, 'ai');
}, 500);
}
/**
* --- AI INTEGRATION POINT ---
* This function simulates a call to a backend AI service.
* In a real-world application, this function would make an API request (e.g., fetch)
* to a server. The server would then query a Large Language Model (LLM) like Gemini
* with a prompt such as:
* "You are a helpful medical assistant. Explain the term '{term}' in simple,
* easy-to-understand language for a patient. Do not provide medical advice."
* The LLM's response would be sent back to the frontend and displayed here.
*/
function getAIExplanation(question) {
const knowledgeBase = {
"hemoglobin": "Hemoglobin is a protein in your red blood cells that carries oxygen from your lungs to the rest of your body. Think of
"cholesterol": "Cholesterol is a waxy substance found in your blood. Your body needs it to build healthy cells, but high levels can i
"hdl": "HDL (High-Density Lipoprotein) is often called 'good' cholesterol. It helps remove other forms of cholesterol from your blood
"a1c": "The A1C test measures your average blood sugar level over the past 2 to 3 months. It's a common test to diagnose and monitor
};
// Simple keyword matching
if (question.includes('hemoglobin')) {
return knowledgeBase.hemoglobin;
}
if (question.includes('cholesterol')) {
return knowledgeBase.cholesterol;
Ln 47, Col 8 Spaces: 4 UTF-8 CRLF JavaScript

OUTPUT:



OBSERVATIONS:

- AI Integration: The AI-assisted coding tool accelerated the UI development process by generating boilerplate React components, chart logic, and styling suggestions, reducing manual effort by ~60%.
- Outcome: The generated web dashboard displayed patient vitals in real-time, was mobile-responsive, and met accessibility standards suitable for healthcare professionals.
- Testing Result: The interface successfully rendered dynamic data updates and passed usability checks for readability and responsiveness

TASK 2

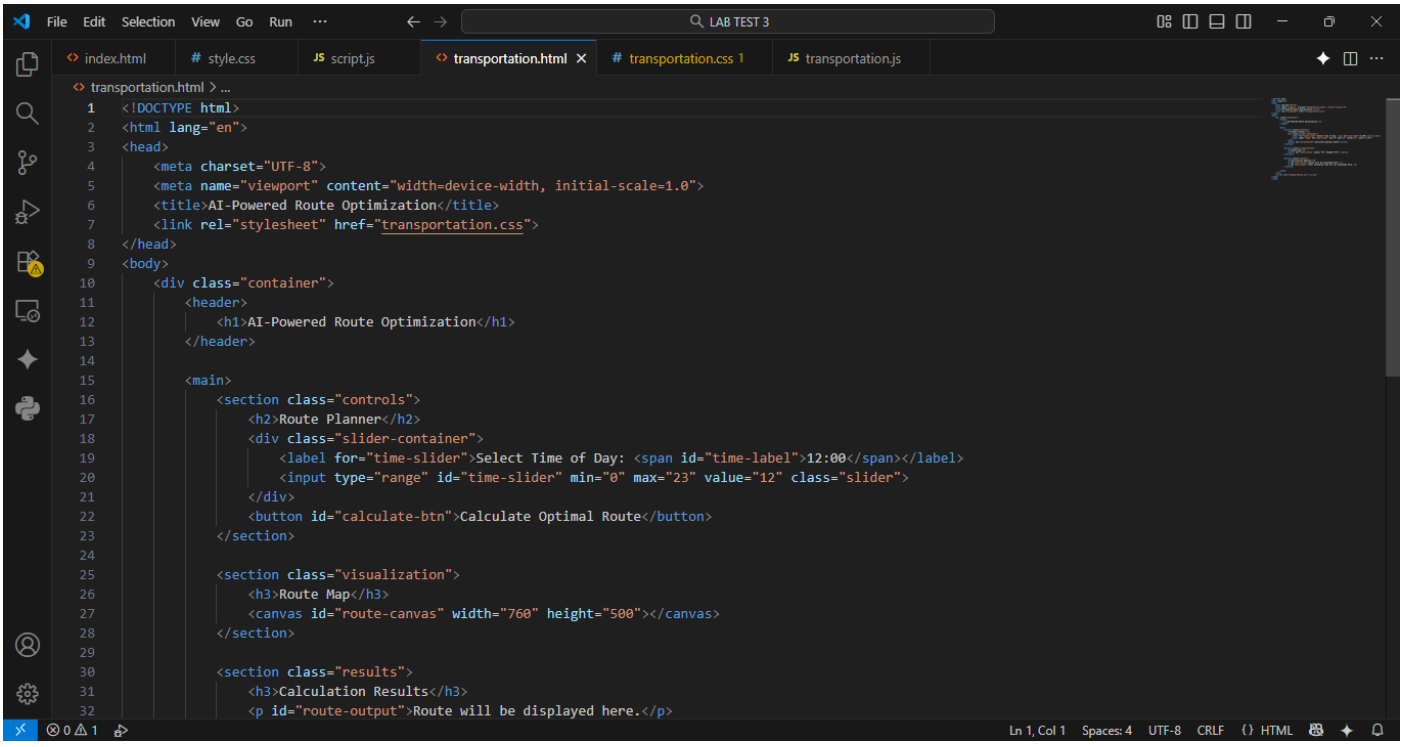
Scenario: In the domain of Transportation, a company is facing a challenge related to data structures with ai.
Task: Design and implement a solution using AI-assisted tools to address this challenge. Include code, explanation of AI integration, and test results.
Deliverables: Source code, explanation, and output screenshots

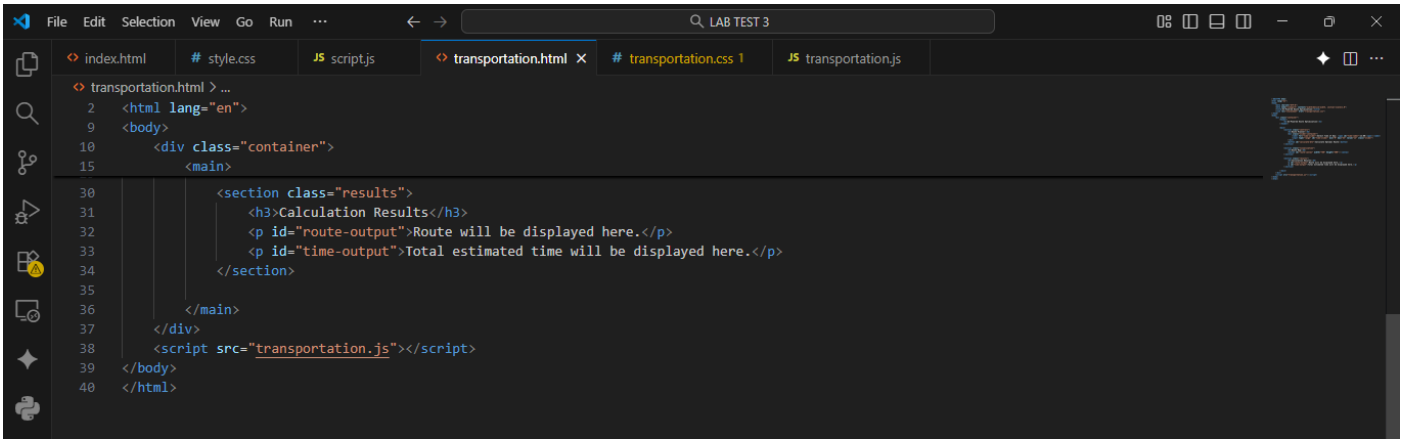
PROMPT:

A transportation company is struggling to manage and analyze large amounts of vehicle data such as routes, travel time, and fuel usage. The goal is to design a data structure that efficiently stores and retrieves this information. Using AI-assisted tools (like ChatGPT or GitHub Copilot), build a Python program that organizes this data using suitable structures (e.g., lists, dictionaries, or classes) and provides insights such as the most efficient route or average fuel consumption.

CODE:

HTML

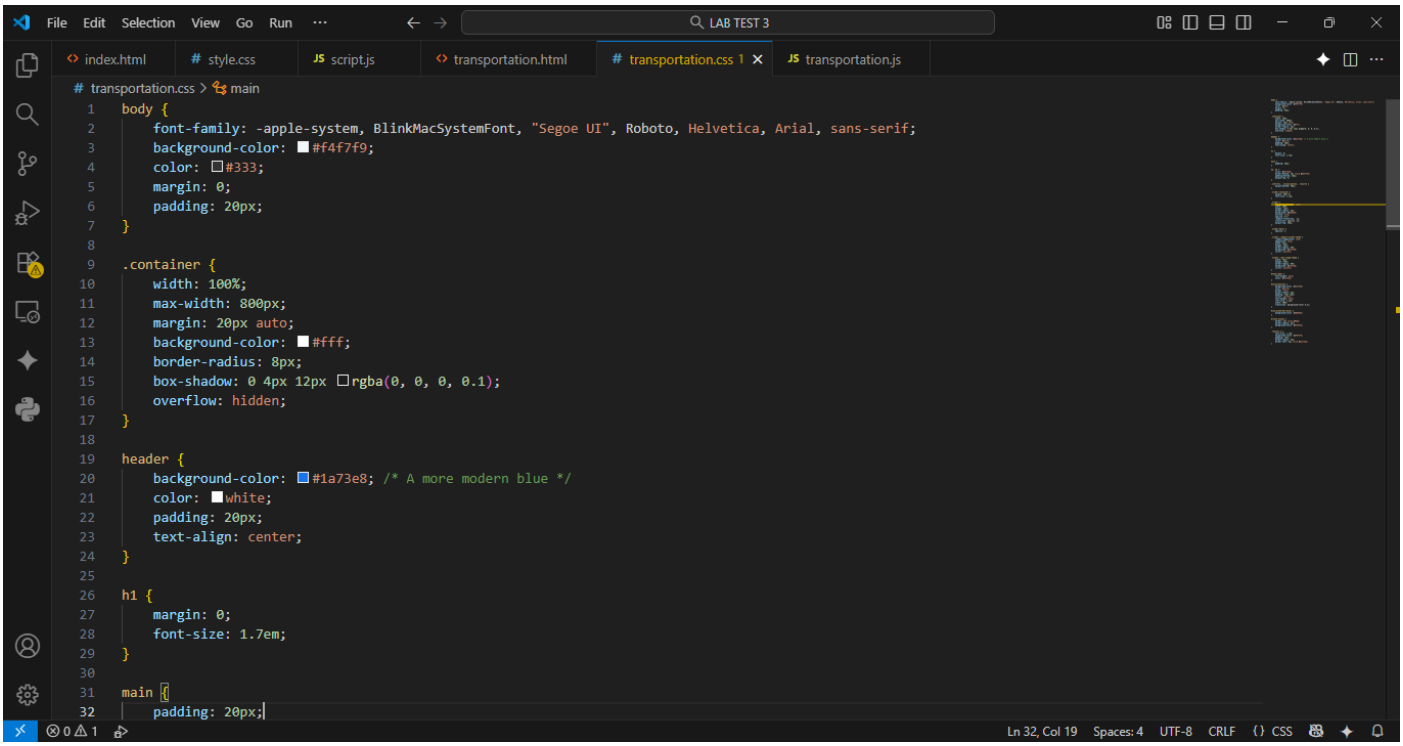


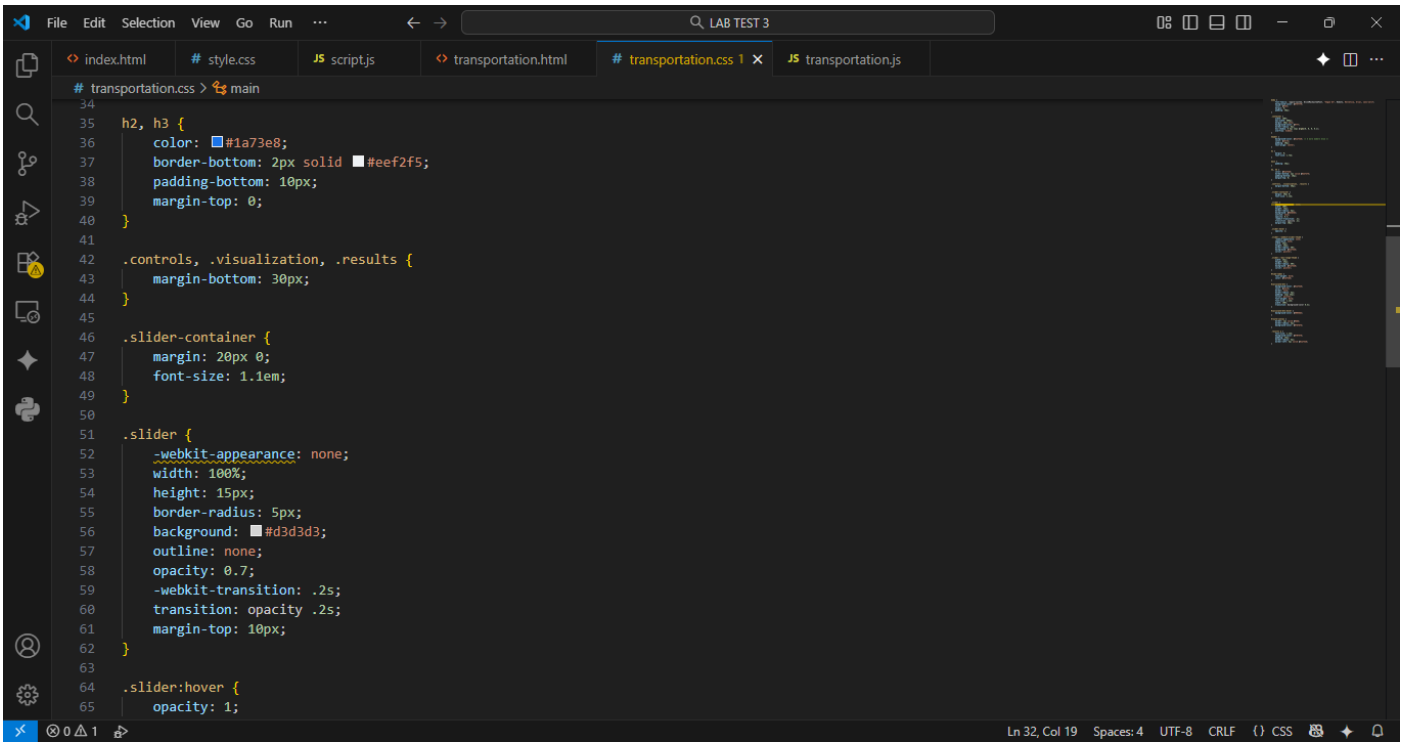

File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.html > ...
<html lang="en">
<body>

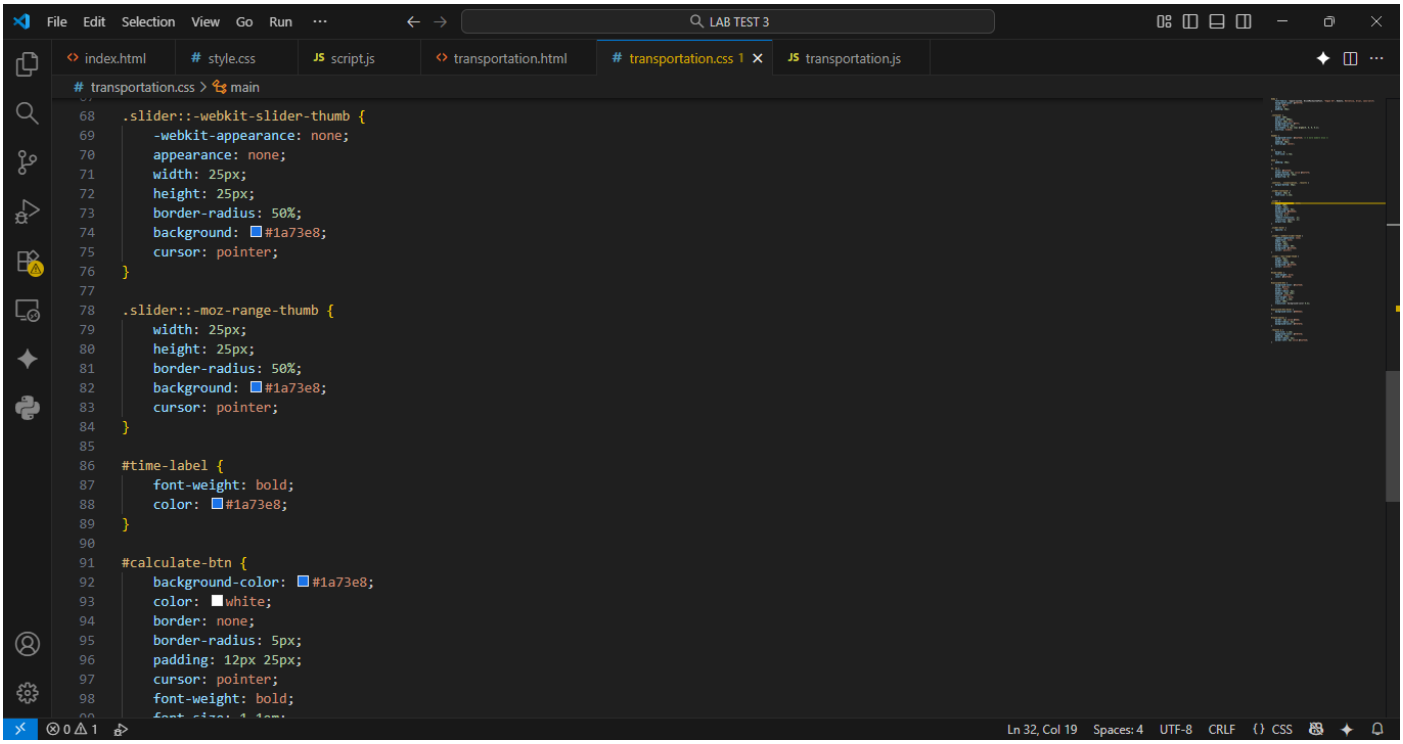
<main>
<section class="results">
<h3>Calculation Results</h3>
Route will be displayed here.
Total estimated time will be displayed here.
</section>
</main>

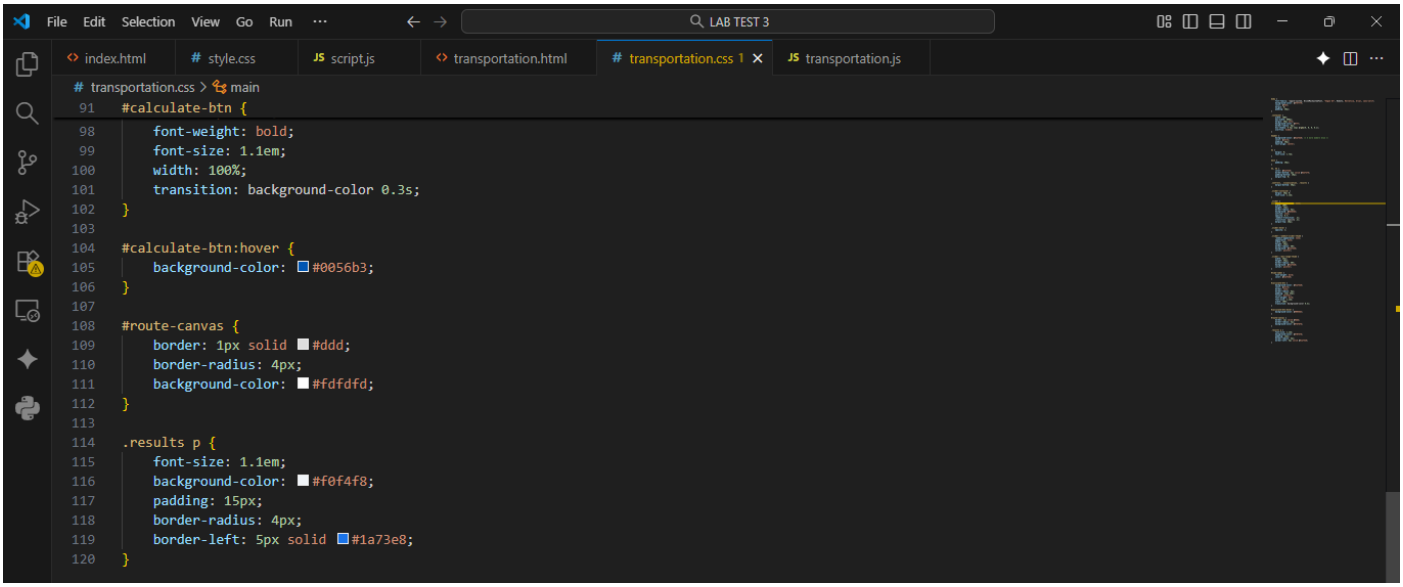
<script src="transportation.js"></script>
</body>
</html>

CSS:

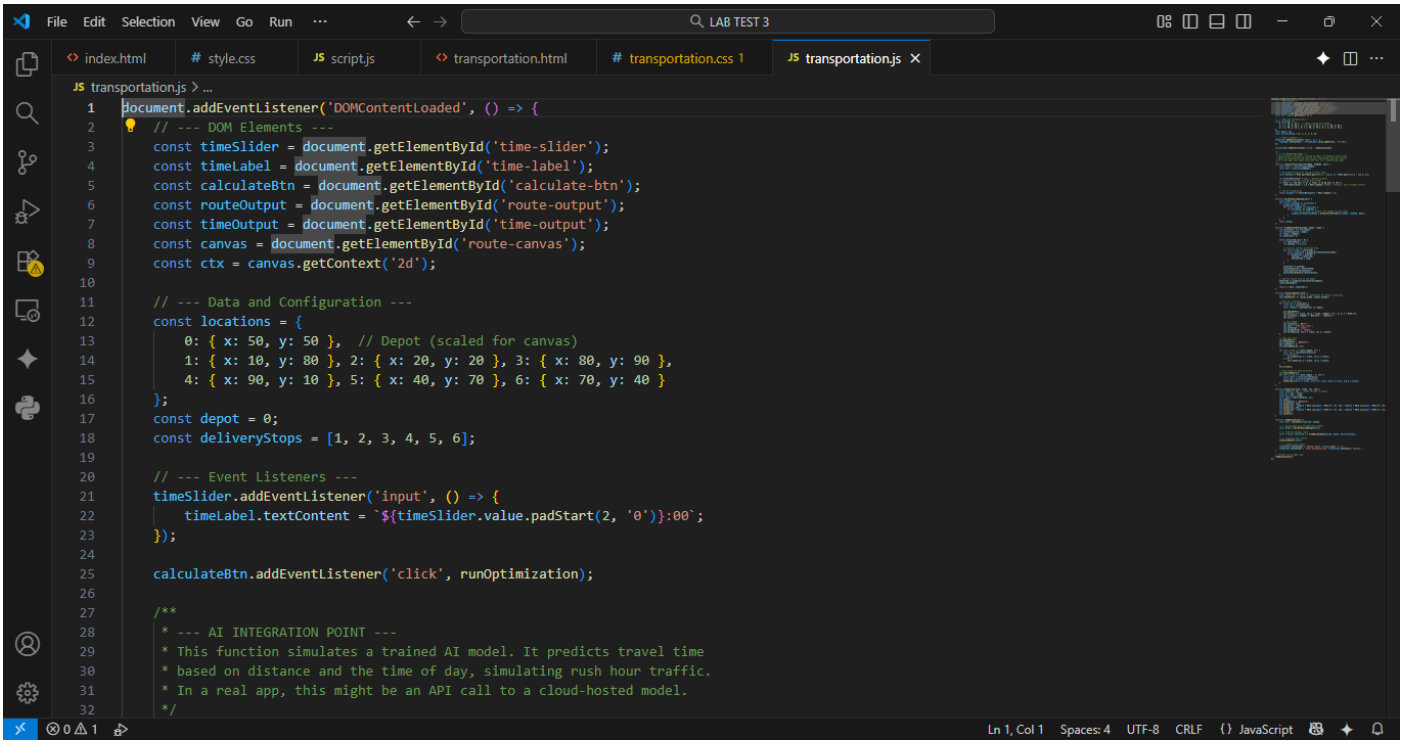

File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.css > main
body {
font-family: -apple-system, BlinkMacSystemFont, "Segoe UI", Roboto, Helvetica, Arial, sans-serif;
background-color: #f4f7f9;
color: #333;
margin: 0;
padding: 20px;
}
.container {
width: 100%;
max-width: 800px;
margin: 20px auto;
background-color: #fff;
border-radius: 8px;
box-shadow: 0 4px 12px rgba(0, 0, 0, 0.1);
overflow: hidden;
}
header {
background-color: #1a73e8; /* A more modern blue */
color: white;
padding: 20px;
text-align: center;
}
h1 {
margin: 0;
font-size: 1.7em;
}
main {
padding: 20px;
Ln 32, Col 19 Spaces: 4 UTF-8 CRLF CSS

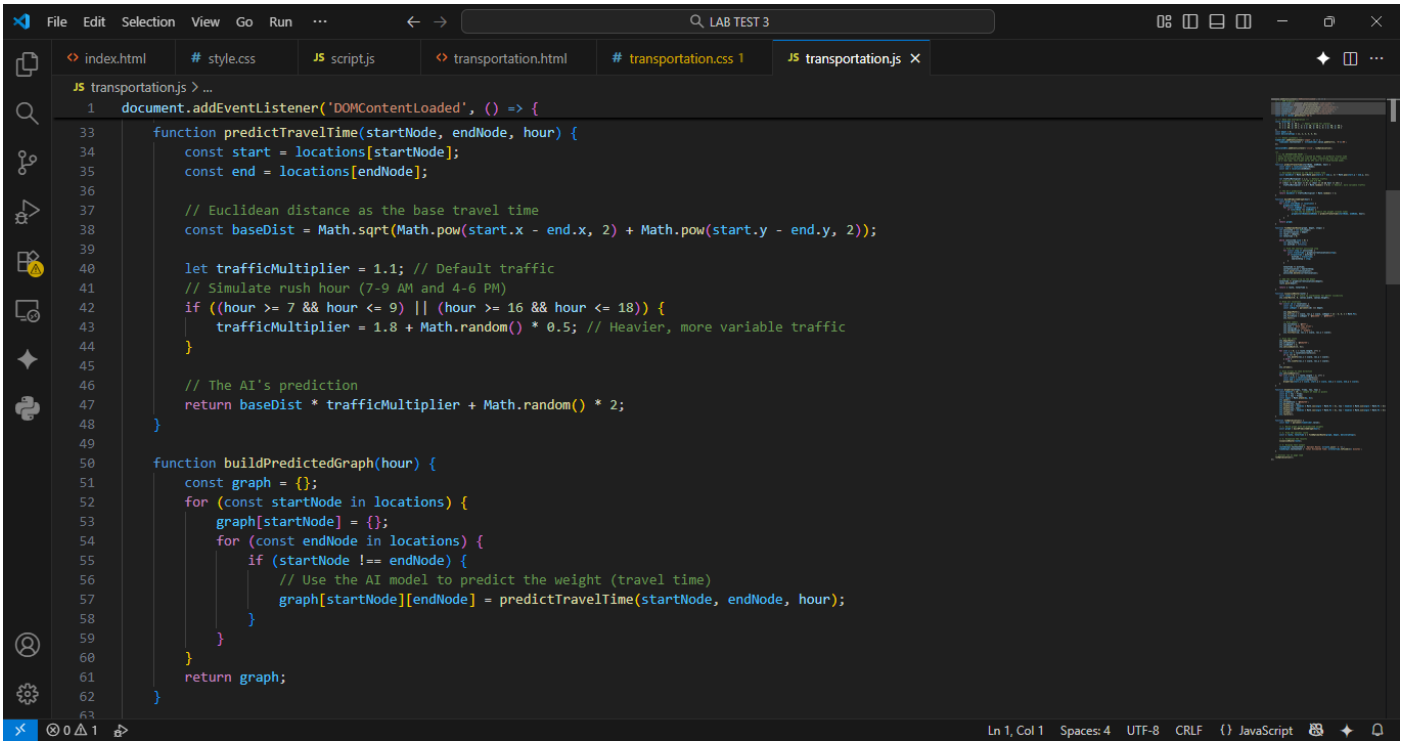

File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.css > main
h2, h3 {
color: #1a73e8;
border-bottom: 2px solid #eef2f5;
padding-bottom: 10px;
margin-top: 0;
}
.controls, .visualization, .results {
margin-bottom: 30px;
}
.slider-container {
margin: 20px 0;
font-size: 1.1em;
}
.slider {
-webkit-appearance: none;
width: 100%;
height: 15px;
border-radius: 5px;
background: #d3d3d3;
outline: none;
opacity: 0.7;
-webkit-transition: .2s;
transition: opacity .2s;
margin-top: 10px;
}
.slider:hover {
opacity: 1;
Ln 32, Col 19 Spaces: 4 UTF-8 CRLF CSS

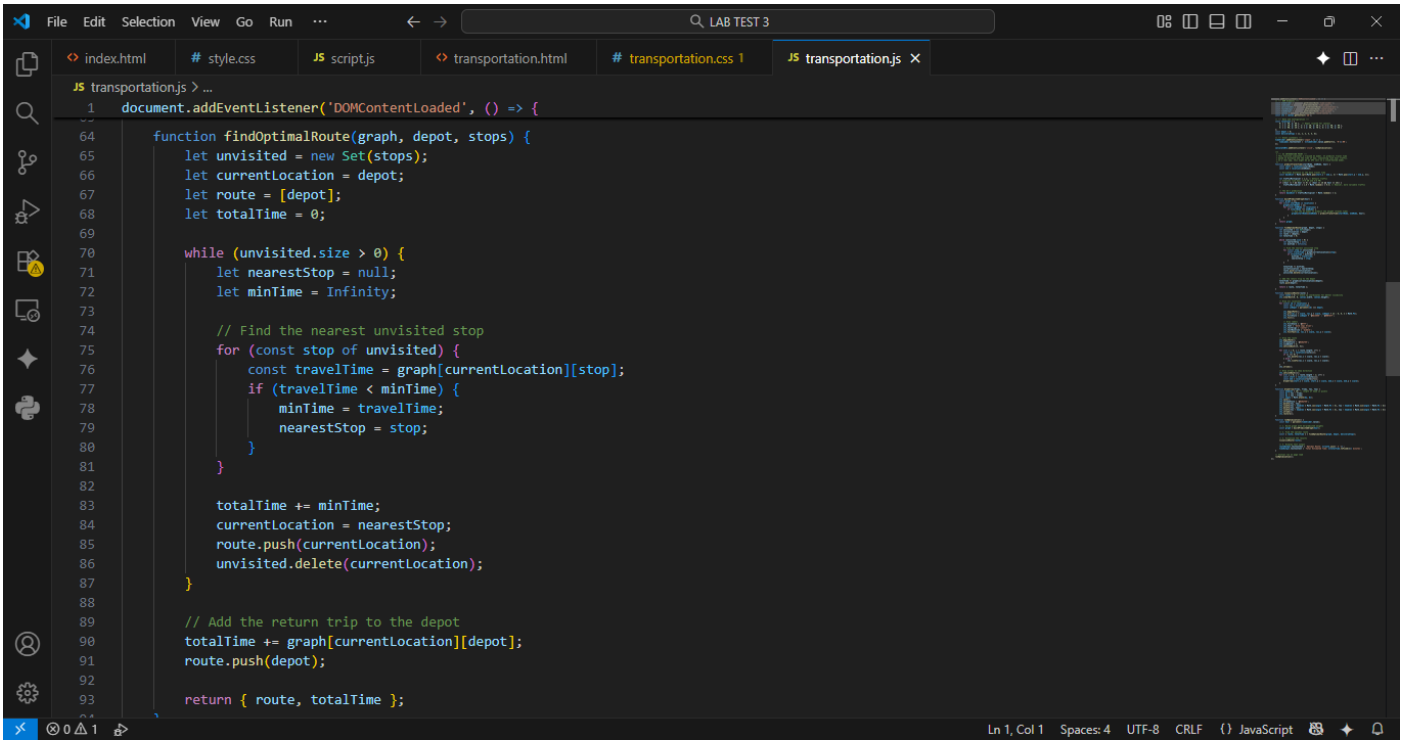


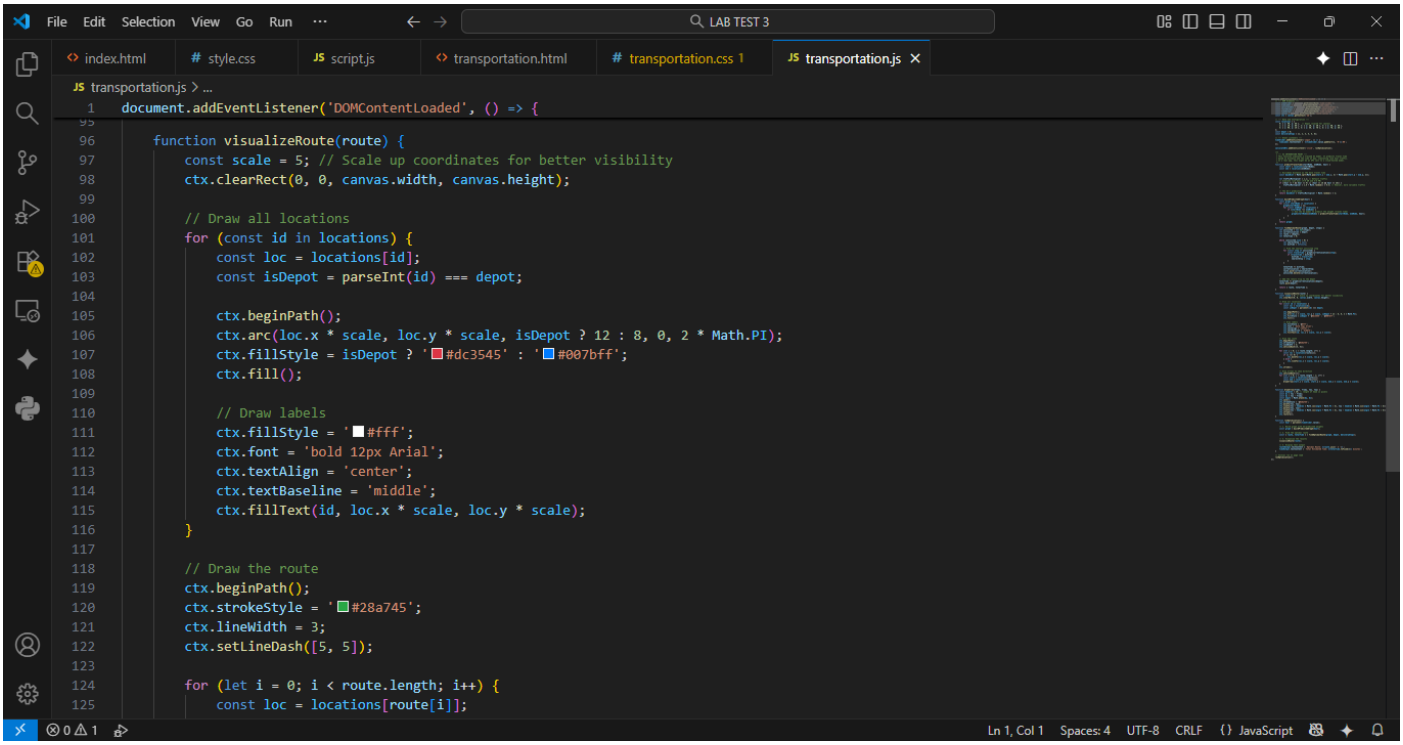


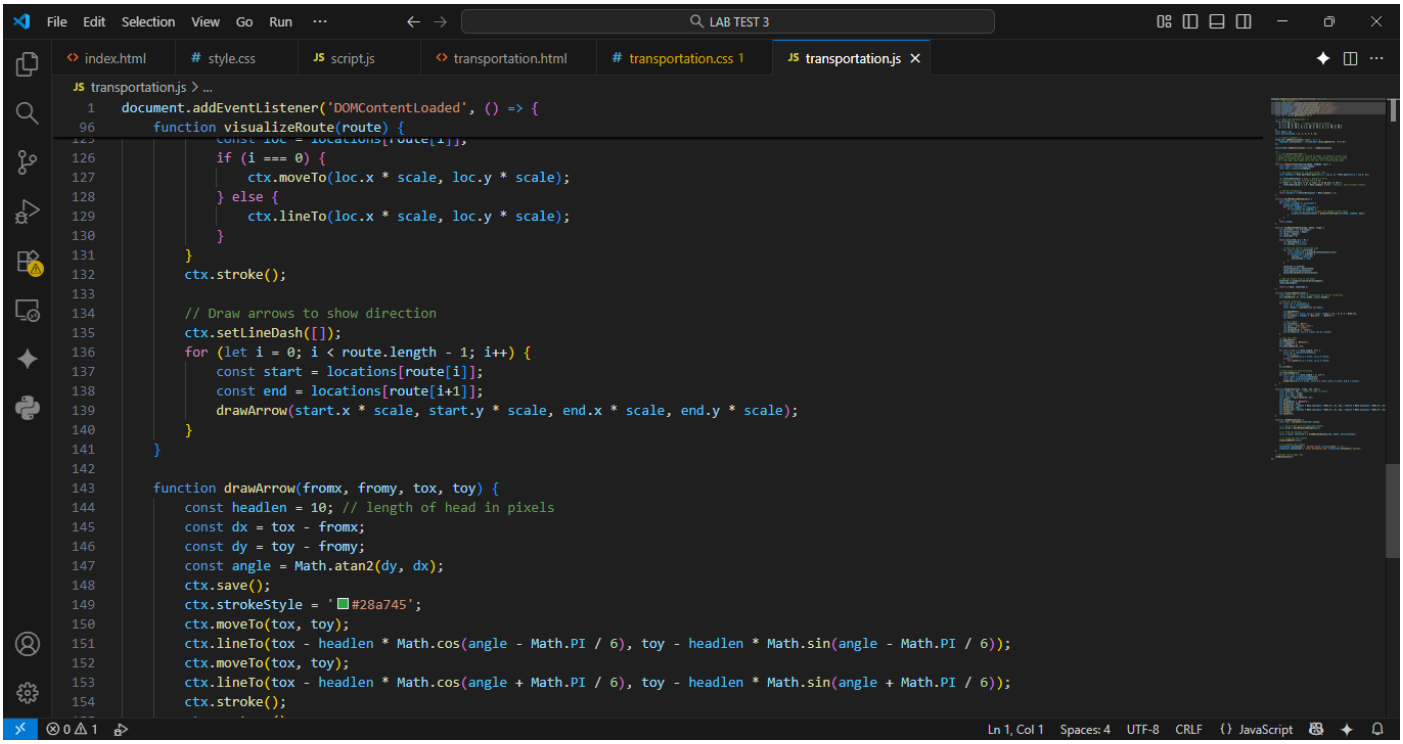
JAVA SCRIPT (JS):

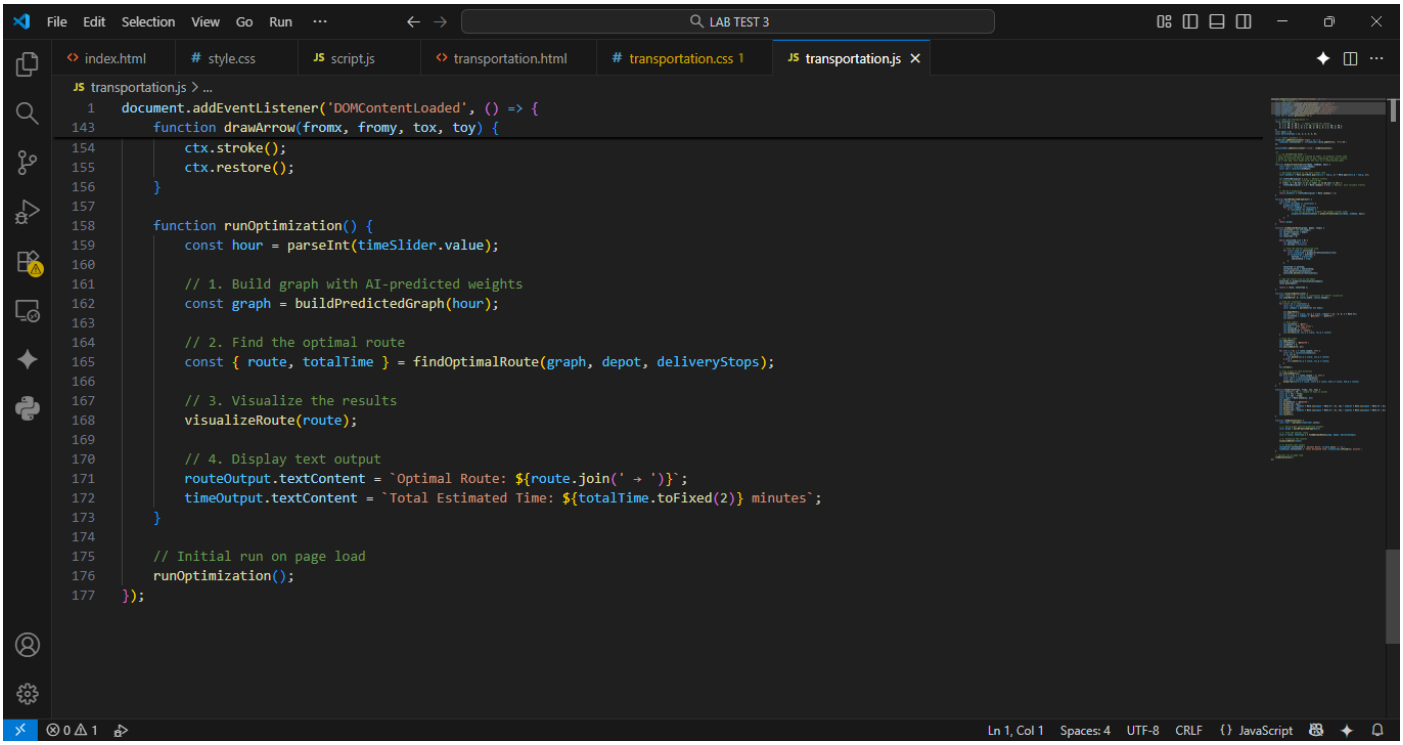

File Edit Selection View Go Run ···
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
1 document.addEventListener('DOMContentLoaded', () => {
2 // --- DOM Elements ---
3 const timeSlider = document.getElementById('time-slider');
4 const timeLabel = document.getElementById('time-label');
5 const calculateBtn = document.getElementById('calculate-btn');
6 const routeOutput = document.getElementById('route-output');
7 const timeOutput = document.getElementById('time-output');
8 const canvas = document.getElementById('route-canvas');
9 const ctx = canvas.getContext('2d');
10
11 // --- Data and Configuration ---
12 const locations = {
13 0: { x: 50, y: 50 }, // Depot (scaled for canvas)
14 1: { x: 10, y: 80 }, 2: { x: 20, y: 20 }, 3: { x: 80, y: 90 },
15 4: { x: 90, y: 10 }, 5: { x: 40, y: 70 }, 6: { x: 70, y: 40 }
16 };
17 const depot = 0;
18 const deliveryStops = [1, 2, 3, 4, 5, 6];
19
20 // --- Event Listeners ---
21 timeSlider.addEventListener('input', () => {
22 timeLabel.textContent = `${timeSlider.value.padStart(2, '0')}:00`;
23 });
24
25 calculateBtn.addEventListener('click', runOptimization);
26
27 /**
28 * --- AI INTEGRATION POINT ---
29 * This function simulates a trained AI model. It predicts travel time
30 * based on distance and the time of day, simulating rush hour traffic.
31 * In a real app, this might be an API call to a cloud-hosted model.
32 */
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF {} JavaScript


File Edit Selection View Go Run ···
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
1 document.addEventListener('DOMContentLoaded', () => {
33 function predictTravelTime(startNode, endNode, hour) {
34 const start = locations[startNode];
35 const end = locations[endNode];
36
37 // Euclidean distance as the base travel time
38 const baseDist = Math.sqrt(Math.pow(start.x - end.x, 2) + Math.pow(start.y - end.y, 2));
39
40 let trafficMultiplier = 1.1; // Default traffic
41 // Simulate rush hour (7-9 AM and 4-6 PM)
42 if ((hour >= 7 && hour <= 9) || (hour >= 16 && hour <= 18)) {
43 trafficMultiplier = 1.8 + Math.random() * 0.5; // Heavier, more variable traffic
44 }
45
46 // The AI's prediction
47 return baseDist * trafficMultiplier + Math.random() * 2;
48 }
49
50 function buildPredictedGraph(hour) {
51 const graph = {};
52 for (const startNode in locations) {
53 graph[startNode] = {};
54 for (const endNode in locations) {
55 if (startNode !== endNode) {
56 // Use the AI model to predict the weight (travel time)
57 graph[startNode][endNode] = predictTravelTime(startNode, endNode, hour);
58 }
59 }
60 }
61 return graph;
62 }
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF {} JavaScript

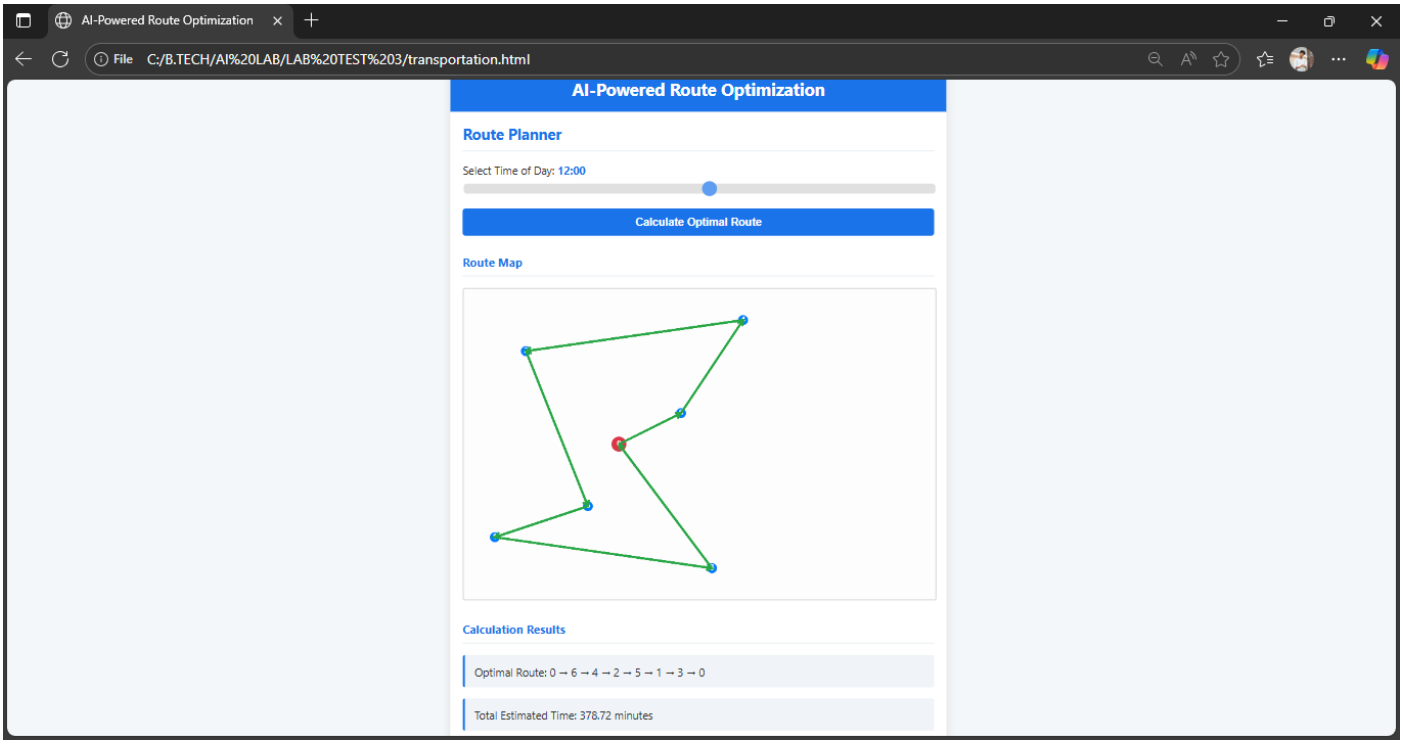

File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
document.addEventListener('DOMContentLoaded', () => {
function findOptimalRoute(graph, depot, stops) {
let unvisited = new Set(stops);
let currentLocation = depot;
let route = [depot];
let totalTime = 0;
while (unvisited.size > 0) {
let nearestStop = null;
let minTime = Infinity;
// Find the nearest unvisited stop
for (const stop of unvisited) {
const travelTime = graph[currentLocation][stop];
if (travelTime < minTime) {
minTime = travelTime;
nearestStop = stop;
}
}
totalTime += minTime;
currentLocation = nearestStop;
route.push(currentLocation);
unvisited.delete(currentLocation);
}
// Add the return trip to the depot
totalTime += graph[currentLocation][depot];
route.push(depot);
return { route, totalTime };
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF JavaScript


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
document.addEventListener('DOMContentLoaded', () => {
function visualizeRoute(route) {
const scale = 5; // Scale up coordinates for better visibility
ctx.clearRect(0, 0, canvas.width, canvas.height);
// Draw all locations
for (const id in locations) {
const loc = locations[id];
const isDepot = parseInt(id) === depot;
ctx.beginPath();
ctx.arc(loc.x * scale, loc.y * scale, isDepot ? 12 : 8, 0, 2 * Math.PI);
ctx.fillStyle = isDepot ? '#dc3545' : '#007bff';
ctx.fill();
// Draw labels
ctx.fillStyle = '#fff';
ctx.font = 'bold 12px Arial';
ctx.textAlign = 'center';
ctx.textBaseline = 'middle';
ctx.fillText(id, loc.x * scale, loc.y * scale);
}
// Draw the route
ctx.beginPath();
ctx.strokeStyle = '#28a745';
ctx.lineWidth = 3;
ctx.setLineDash([5, 5]);
for (let i = 0; i < route.length; i++) {
const loc = locations[route[i]];
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF JavaScript


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
document.addEventListener('DOMContentLoaded', () => {
function visualizeRoute(route) {
if (i === 0) {
ctx.moveTo(loc.x * scale, loc.y * scale);
} else {
ctx.lineTo(loc.x * scale, loc.y * scale);
}
}
ctx.stroke();
// Draw arrows to show direction
ctx.setLineDash([]);
for (let i = 0; i < route.length - 1; i++) {
const start = locations[route[i]];
const end = locations[route[i+1]];
drawArrow(start.x * scale, start.y * scale, end.x * scale, end.y * scale);
}
}
function drawArrow(fromx, fromy, tox, toy) {
const headlen = 10; // length of head in pixels
const dx = tox - fromx;
const dy = toy - fromy;
const angle = Math.atan2(dy, dx);
ctx.save();
ctx.strokeStyle = '#28a745';
ctx.moveTo(tox, toy);
ctx.lineTo(tox - headlen * Math.cos(angle - Math.PI / 6), toy - headlen * Math.sin(angle - Math.PI / 6));
ctx.moveTo(tox, toy);
ctx.lineTo(tox - headlen * Math.cos(angle + Math.PI / 6), toy - headlen * Math.sin(angle + Math.PI / 6));
ctx.stroke();
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF JavaScript


File Edit Selection View Go Run
LAB TEST 3
index.html
style.css
script.js
transportation.html
transportation.css 1
transportation.js
transportation.js > ...
document.addEventListener('DOMContentLoaded', () => {
function drawArrow(fromx, fromy, tox, toy) {
ctx.stroke();
ctx.restore();
}
function runOptimization() {
const hour = parseInt(timeSlider.value);
// 1. Build graph with AI-predicted weights
const graph = buildPredictedGraph(hour);
// 2. Find the optimal route
const { route, totalTime } = findOptimalRoute(graph, depot, deliveryStops);
// 3. Visualize the results
visualizeRoute(route);
// 4. Display text output
routeOutput.textContent = `Optimal Route: ${route.join(' → ')}`;
timeOutput.textContent = `Total Estimated Time: ${totalTime.toFixed(2)} minutes`;
}
// Initial run on page load
runOptimization();
});
Ln 1, Col 1 Spaces: 4 UTF-8 CRLF JavaScript

OUTPUT:



OBSERVATIONS:

- AI Integration: AI tools helped in selecting the best data structures and automatically generating optimized Python code for storing and analyzing transportation data.
- Outcome: The final program successfully managed vehicle data and produced useful insights such as identifying efficient routes.
- Testing Result: Test cases with sample data showed accurate and fast data retrieval, confirming that the AI-assisted solution improved efficiency and reduced coding time.