**Smart Route Navigator: Shortest Path Finder using Dijkstra’s Algorithm on Leaflet Map**

**1. Project Description**

Smart Route Navigator is a web application that allows users to select two predefined points on a map and calculates the shortest route between them. The site uses Dijkstra’s Algorithm to find the shortest path and visually displays it as a red line between the two selected points.

**2. Tools & Libraries**

* Frontend: HTML, CSS, JavaScript
* Map Visualization: Leaflet.js
* Algorithm: Dijkstra’s Algorithm
* Data Format: JSON

**3. Project Structure & Files**

The project has the following file structure:

smart-route-finder/

├── index.html

├── style.css

├── script.js

├── graph-data.json

├── dijkstra.js

├── README.md

**4. Algorithm Explanation**

Dijkstra’s Algorithm finds the shortest path between two nodes in a graph. In this application, the algorithm works as follows:

1. Calculates the distance from the starting point to all other nodes.
2. Visits the neighboring node with the smallest distance and updates distances.
3. Repeats this process until all relevant nodes are visited.
4. Returns the shortest path and total distance.

**5. Project Features**

* **Map Visualization:** The map displays points and paths using Leaflet.js.
* **Dynamic Route Calculation:** After selecting two points, the application runs the Dijkstra algorithm to compute the shortest route and displays it on the map.
* **Data Loading:** Road network data is loaded from the graph-data.json file, enabling dynamic interaction on the map.
* **Path Visualization:** The shortest path is highlighted with a red line on the map.

**6. GitHub Project Link**

You can access the full source code of the project at the following GitHub repository:  
<https://github.com/CHE5T3R/Smart-Route-Navigator>