1.Introduction

The **Route Optimization System** is a web-based project designed to determine the shortest and most efficient route between two locations. It integrates the **Google Maps API** with **HTML, CSS, and JavaScript** to provide users with a dynamic and interactive interface for route calculation and visualization. By allowing users to input their starting point and destination, the system automatically calculates the optimized path, total distance, and estimated travel time. This helps in minimizing fuel consumption, saving travel time, and improving navigation accuracy. Additionally, the system features a **secure login page** to ensure authorized access. The main objective of this project is to enhance user experience in navigation and transportation by providing real-time route optimization. It serves as a useful tool for students, developers, and transport managers to understand how technology and algorithms work together in solving real-world routing problems effectively.

2. Background

In today's fast-paced world, efficient route planning plays a crucial role in transportation, logistics, and daily commuting. Traditional methods of determining routes often rely on manual estimation or static maps, which may not always provide the best results in terms of distance or time. To overcome these limitations, the **Route Optimization System** utilizes modern web technologies and the **Google Maps API** to calculate and visualize the most efficient route between two points. With the rise of digital mapping services, such systems have become essential

for delivery services, cab management, and personal travel planning. This project integrates a user-friendly web interface that enables users to input locations and instantly view optimized routes. Additionally, incorporating a secure login mechanism ensures controlled access to the system. By combining **JavaScript-based interactivity** and **real-time mapping**, the project demonstrates how technology simplifies complex navigation tasks in an engaging and educational way.

3.Objectives