

You are tasked with optimizing the route selection in a cab booking app. The app operates in a city with 50 key locations, and you need to determine the shortest path between any two locations in the city. The city is represented as a graph where nodes correspond to locations (e.g., landmarks, neighborhoods) and edges represent the roads connecting them, with weights corresponding to the distance between locations.

Problem Description:

Given a graph representing the city with 50 nodes (locations) and weighted edges (distances between locations), your task is to implement the All Pair Shortest Path (APSP) algorithm. The goal is to calculate the shortest paths between all pairs of locations in the city.

Each location in the city has a unique name (e.g., "Airport", "Central Station", "City Hall", etc.). You will be provided with a distance matrix that represents the distances between each pair of locations.

Input:

A symmetric 50x50 distance matrix where:

distance[i][j] represents the distance (in kilometers) between location i and location j.

The matrix is symmetric, meaning distance[i][j] == distance[j][i].

The diagonal elements (distance[i][i]) are 0, as the distance from any location to itself is zero.

A list of 50 location names corresponding to the rows and columns of the distance matrix.

Here is a list of 50 named locations to use in the city graph. These represent a mix of common urban areas, landmarks, and points of interest (POI) typically found in a city:

Named Locations:

Airport
Central Station
City Hall
University
Downtown Mall
Business Park
Tech Hub
Old Town Square
Residential Zone 1
Residential Zone 2
Residential Zone 3
Residential Zone 4
Main Library
Museum of Art
Convention Center
Sports Arena
City Park
Waterfront
Harbor
Industrial District
Zoo
Hospital
Police Station

Fire Station
Train Depot
Shopping Plaza
Cinema Complex
Amusement Park
Botanical Gardens
Golf Course
City Market
Cathedral
Historical Museum
Luxury Hotel
Suburban Area 1
Suburban Area 2
Tech Campus
Warehouse District
Tech Research Center
Local Stadium
Art Gallery
Public Swimming Pool
Concert Hall
Fitness Center
Urban Plaza
Food Court
Science Museum
Bridgeview
City Outskirts
Recreation Center