DSA PROJECT

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TITLE :

Shortest Path Finder with Location Information

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INTRODUCTION

- This c program implements Dijkstra's algorithm to find the shortest path between two colleges in a city map represented as a graph.
- The city map is depicted as an adjacency matrix, where each cell represents the distance between two vertices (locations).
- Additionally, the program provides a visual representation of the city map and retrieves textual information about landmarks or locations corresponding to the destination vertices.

PROBLEM STATEMENT

Implement Dijkstra's algorithm to efficiently find the shortest path from a given source location to a destination location.

First Problem

I. Input a weighted graph representing the map, where vertices represent locations and edges represent distances between them.

Second Problem

I. Provide additional location information by reading text files associated with specific destinations and display relevant details upon reaching those destinations.

LITERARY REVIEW

1. The algorithm iteratively selects the vertex with the minimum distance from the source vertex and updates the distances of its adjacent vertices if a shorter path is found.

2. The code performs basic input validation by checking if the source and destination vertex indices are within the valid range. However, it does not handle cases where non-integer inputs are provided or other potential input errors.

3. Reads additional information from text files associated with specific destinations and displays it upon reaching those destinations. This feature adds richness to the user experience by providing supplementary details about each location.

OBJECT OF STUDY

Objective 1

Shortest Path Finding: The primary objective is to implement Dijkstra's algorithm to find the shortest path between a given source vertex and destination vertex in a graph.

Objective 2

Path Visualization: Additionally, the code includes functionality to visually represent the city map and display the shortest path between source and destination vertices.

METHODOLOGY

Qualitative Method

Dijkstra: Dijkstra's algorithm to find the shortest path for a given adjacency matrix graph.

Quantitative Method

MinDistance: Finds the vertex with the minimum distance value from the set of vertices not yet included in the shortest path tree.

The program retrieves additional textual information about landmarks or locations associated with specific destination vertices from external text files (COEP.txt, AIT.txt, MIT.txt, IIIT.txt, PICT.txt,etc).

CONCLUSION

- The program continues to prompt the user for source and destination vertices until manually terminated.
- Summarizes the key aspects of the program's functionality and execution flow, providing a comprehensive overview of the Implementation of Dijkstra's algorithm for finding the shortest path in the city map.


Thank You