CAMPUS NAVIGATION SYSTEM

JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY

DATA STRUCTURES

PROJECT SYNOPSIS

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PROBLEM STATEMENT

There exist many advanced navigation systems but most of them are unable to provide routes precisely as well as information of buildings within a region such as campus, shopping mall, hospital, etc. Nowadays, as people are getting more and more connected to technology, they have lost their human touch. Also, people feel more convenient to search for the problem themselves rather than asking someone for help.

An informative, reliable and precise guidance system is very important in this technological era. It should be able to navigate the user no matter if the user is under the indoor or outdoor environment. The guidance system must be user-friendly and able to process data efficiently. Since the size of any college/university campus can vary from 30 acres to anywhere around 200 acres, students spend the majority of their time traveling between different buildings. New students feel it is inconvenient to search their way inside the campus. Therefore, a navigation system is required to find the optimal path within the campus and for the aforementioned problem.

BASIC CONCEPTS AND TOOLS USED:

- Linked List (Circular LL)
- Graphs
- Trees (Shortest Path Tree)

MAIN FUNCTIONING OF THE PROGRAM

Dijkstra's algorithm is for minimum spanning tree. In Dijkstra's we generate a SPT **(shortest path tree)** with given source as root. We maintain two sets, one set contains vertices included in shortest path tree, and other set includes vertices not yet included in shortest path tree. At every step of the algorithm, we find a vertex which is in the other set (set of not yet included) and has a minimum distance from the source. The Dijkstra's algorithm maintains two sets of vertices which are: L: Labeled vertices (shortest path is known) C: Candidate vertices (shortest path not yet known) One vertex is moved from C to L in each iteration

The steps to be followed for completing the proposed project are as follows: 1 Identification of key locations in campus infrastructure- Key Structural points in the campus are to be identified, which work as the node points for the Dijkstra's Algorithm 2 Distance Estimation -Estimated distance is calculated which works as the weight between **two adjustment nodes**, hence a **weighted directed graph** is generated. 3 Proposing the shortest Path to the User- Using the Dijkstra's Algorithm the program will **suggest the shortest optimal path.**

FLOWCHART:

START THE PROGRAM

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ESTIMATE DISTANCE BETWEEN VARIOUS CAMPUS INFRASTRUCTURE

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MAP DESIGNING

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ALGORITHM IMPLEMENTATION AND CODING

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MAP DESIGN AND ALGORITHM INTEGRATION

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FINALISING..

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PROGRAM ENDS!

SHORTEST PATH FOUND AND DISPLAYED!