DESIGN AND ANALYSIS OF ALGORITHMS- MINI PROJECT

TITLE: EMERGENCY VEHICLE DISPATCH

OBJECTIVE:

The objective of this project is to find and allocate an available emergency vehicle, taking source and destination as inputs and providing an optimum path during the course of travel. At the start details such as person's name, age, phone number, source and destination are collected.

APPROACH:

In this approach initially a map is shown which consists of different locations and hospitals. Each of which is a node. Source location and hospital destination are to be selected from the map. Optimum path and estimated fare are displayed to the user. Based on the availability, an emergency vehicle would be dispatched to the source location. Now, given the distance and traffic optimal path is generated and the vehicle is ready to go. In case of any complications at the destined location, re-routing of path to a near by hospital is also made available. Based on these the fair would be charged at the end.

ALGORITHM:

Dijkstra algorithm is implemented in this project to find the shortest path between source and destination.
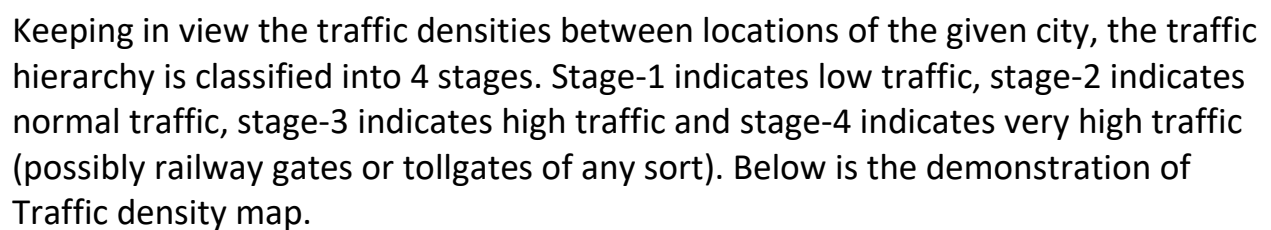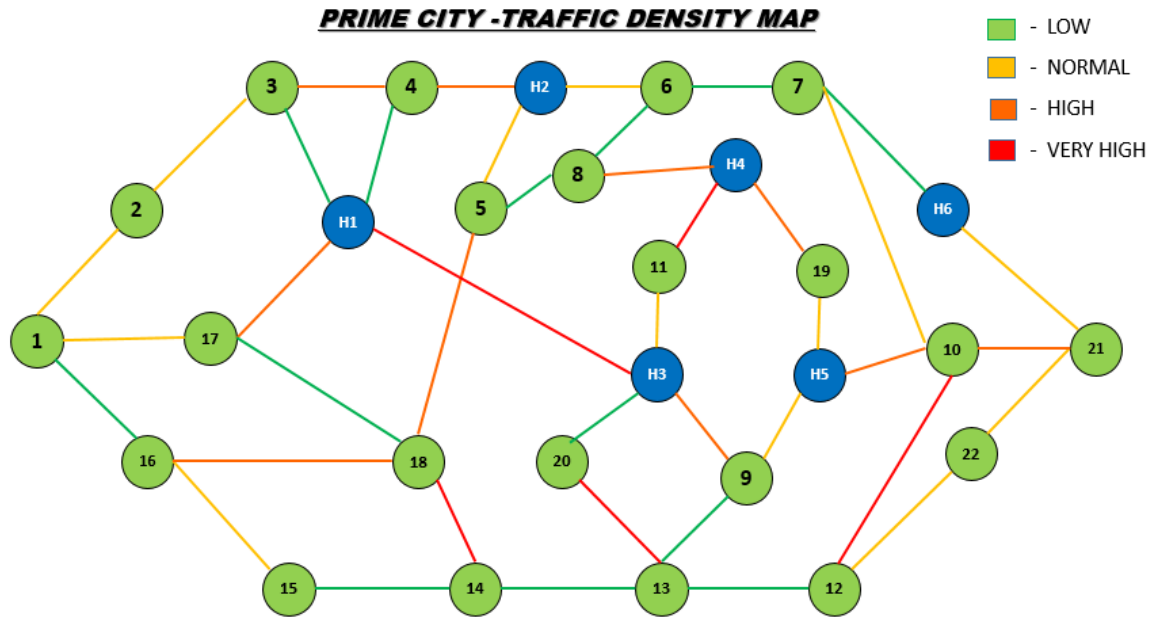
Attributes Provided:

- • Places as nodes
- • Distance and traffic density as the edges weight with connected vertices

During the course of travel since the traffic density isn't constant, different traffic densities are allocated between each of the locations. The densities range from low to very high. As the traffic density increases, weight of the path is increased. So the distance and traffic densities are deciding factors for weight of that particular path. Based on the traffic density levels, routing is organized. Considering the distance and traffic density, weight is decided and shortest weighed path is chosen as optimal path.

ASSUMPTIONS:

• Traffic densities are fixed between two locations

WORKING:

In working segment of the project, name of the city considered is "Prime City". A total of 22 locations and 6 hospitals are considered in the map and are connected in various ways. Below is the demonstration of the city map. Blue colored vertices indicate hospitals and green ones indicate locations.

PRIME CITY - LOCATION MAP

Keeping in view the traffic densities between locations of the given city, the traffic hierarchy is classified into 4 stages. Stage-1 indicates low traffic, stage-2 indicates normal traffic, stage-3 indicates high traffic and stage-4 indicates very high traffic (possibly railway gates or tollgates of any sort). Below is the demonstration of Traffic density map.

PRIME CITY -TRAFFIC DENSITY MAP

When the source location is selected, the user is asked to either choose a hospital or a nearby hospital would be allocated. If due to any technical reasons like non availability of hospital beds, closed admissions, lack of medical equipment in destined hospital or need of increase in criticality of case and advanced medical supervision is required, the status of admission is considered and re-routing to a different hospital gets enabled.

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