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CS 225 Data Structures
Final Project Goals

Project:

The aim of our project is to find the shortest possible path (using Dijkstra's algorithm) from one airport to another, with the help of user input- the user input will be the source airport and destination airport, and our program will output a highlighted path in the graph, along with the total distance (sum of the weights). We will compute the distance and this will be used as the weightage of an edge in our graph. The nodes in our graph will be represented by the airports themselves.

Dataset:

As a group, we are planning to use OpenFlights open source dataset to obtain airport location and flight route information. The routes database (file: routes.dat) will be used to get the specific routes from one airport to another. The airports database (file: airports.dat) will be used to get the latitude and longitude of the source and destination airports.

Algorithms:

We are planning to use Breadth First Search using Dijkstra's Algorithm for our final project. Dijkstra's algorithm, similar to Prim's algorithm of the minimum spanning tree, generates the shortest path from Node A to Node B using the weights of the edges provided. By using Dijkstra's algorithm, we are generating the shortest distance from one airport to the destination airport using weights that are represented as the distances from the node airports. By storing the "edges" into a priority queue, we can determine the path that will get us to the destination in the shortest amount of time via airplane.

For our choice of a complex or uncovered option, we are deciding to go with graph coloring i.e. we will highlight the shortest path that our algorithm finds so it stands out.

Additional goals (if time permits):

We will also output a table of all routes possible organized from shortest to longest distance. This will help the user see which path is most optimal.