

Final Project Goals

Dataset:

OpenFlights Airports, Airlines, and Routes data, available from <https://openflights.org/data.html>.

Airports: Names, locations, and more for airports around the world.

Airlines: Names, aliases, and other information regarding every airline.

Routes: Departure and arrival locations for routes flown by included airlines.

Graph:

A directed graph will be generated from the routes, with weights on each edge will be calculated by finding the distance between the two nodes (airports) that they connect. Two nodes are considered to be connected if there is some airline that flies a route between them, and the graph will not have multiple edges for each airline.

Traversal: (BFS)

We will be using Breadth First Search in our project.

Main Algorithms:

The main portion of our project will be finding the shortest path between two airports, using Dijkstra's Algorithm and the Floyd-Warshall Algorithm. Users will be able to specify which algorithm they wish to use when running the program.

Secondary Algorithms:

In addition to finding the shortest path, our program will also be able to run a Landmark path algorithm to find a shortest path that includes some given airports. Our program will also include functionality to project the output of any of the algorithms onto a world map, highlighting the airports and edges included in the path. It will also be able to project all of the airports onto the world map, with the option to show the routes as well. Additionally, we will be implementing a variation of the PageRank algorithm, "AirportRank," to judge airport importance based on the number of routes entering and leaving them. The output of this will be projected onto the world map, with the size of the airports corresponding to how important they are.