

## Final Project Goals

For our final project, we are using the route database from OpenFlights (<https://openflights.org/data.html>). We are using the dataset that contains exclusively airport route information. This dataset contains 67663 routes between 3321 airports on 548 airlines spanning the globe. In this database, each route entry contains information on the airline, the source airport, destination airport, and the number of stops in the route. The routes are directional, so if an airline operates a service from A to B and B to A, the A-B and B-A are listed separately.

To process this data into a directed graph, the airports will represent vertices, and the routes will represent edges. We plan to implement BFS in order to traverse the graph and find a route from one airport to another. We will also implement Dijkstra's Algorithm in order to find the shortest path from one airport to another, as well as Landmark Path to find the shortest route between two airports that also passes through a third landmark airport. Using these traversals and algorithms, we plan to include a feature where the user is able to filter for routes based on specific airlines, as well as specific airport location and destinations. We also plan to compare runtimes of the algorithms to see which one is the optimal one to use for certain scenarios. After implementing, we will thoroughly test the program to make sure that it is calculating each algorithm correctly.

If we have time before the project is due, we can look into ways to output a visualization of the discoveries we have made. For example, projecting the routes onto a map of the world. This would be done by first obtaining an image of the world map where each pixel represents a latitude and longitude coordinate, and then using the CS 225 PNG class to plot the path of the route from airport to destination.