

## Project Goals

Our team have decided to use the airport dataset and when the user insert two location including altitude and longitude, our program will be able to find the two airports where his starting point and destination airport are. We will also set a stop in the way and return the shortest path for the user. We will load the data files from our selected data sets as a graph, in which nodes represent airports, and edges mean there are route between the two airports, which in our program we set that all the airports are connected.

We will first create a graph locating every airport on a rectangular map, using its altitude and longitude provided in the data set, (a dot representing each airport). Each dot in the graph we created representing an airport with its name label. As we also used the route dataset, we could read from file and know if there are route between any two airports. Then we will be using functions calculate the weight of the edges (with two airports' altitude and longitude). Which the weighted edge is an important part for our Dijkstra's Algorithm, by which it will compare the edge weights and return the shortest path between two places.

We will also implement BFS traversal which contributes to finding the pair of the source and destination airport. We will put in within the graph functions and determine if there should be path between the two airports (if route is listed in routes.dat.txt file). And it will give us the name of the two airports which we will insert an edge between those two nodes.

The third function we chose to implement is the Landmark Path, as it was discussed in the earlier of this passage, we are making the user stop between his or her starting point and destination. And we can do that by using the Landmark Path function, where this algorithm will let us find the shortest path from a to b through c as being described on the internet.

Finally, test files and read me file are also important parts in our final project. As we will need to know if our graph works properly or not. This will include if our code complies and several test case to see if the function is working correctly, this step also makes sure that our code also runs on EWS. And the read me file will give the code user a direct view on what our program do and what input he needs to put in in order to get the correct output.

Signature: Ethan Huang, Shuo Wang, Shuning Zhang