Project Goals

I. Dataset:
OpenFlights. This dataset provides us with the absolute location (latitude and longitude) and airlines of every airport. We can use the absolute location to calculate the distance between two airports. (https://openflights.org/data.html) The two datasets we will use are airport dataset and route dataset. The format of the dataset will be a .dat file where each line contains detailed information for an airline route.

II. Data structure:
Adjacency List
Vertices: a unique id of the airport, latitude, longitude, and some pointers.
Edges: two nodes are connected by an edge if there exist an airline between them
Graph drawing:

III. Traversals:
BFS. WE prefer BFS to traverse the graph because it has more functionalities than DFS and is advantageous to our clustering finder.

IV. Covered Algorithm:
Shortest path (Dijkstra's Algorithm)

V. Complex or uncovered option:
a. Graphic Output of Graph: According to the latitude and longitude of nodes, we put them in the right place in the world map. We use the number of incident edges connected to each node to decide its color. The color varies according to the degree of the node. The airlines can be drawn as straight lines on the map.
b. Clustering Finder: We can use this algorithm to determine what location groups in the world are not reachable by the majority of the airlines - they are called minority. Minority, as opposed to majority, are defined as a connected graph component that has less than or equal to 10 airports.

VI. Testcase
Test cases help check the correctness and debug. readFromFile class and graph class need test cases to verify.