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**Individual report**

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Intermediate Computer Programming

22-23\_SEM1\_CS313\_B

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**Introduction**

The aim of this project was to implement a program that takes in a user file containing the user’s start location and end destination as input and returns a sequence of flights and respective airports the user can see to get to the end destination

**Approach**

To begin, I uploaded all the necessary files needed for the project;- routes.csv, airlines.csv, and airports.csv. I created a reading class for each of the files. In each reading class, I used the fstream library to open and read the file and used the sstream library to split the words on each line in the file and store them in respective variables. In each file, a map was created, which stored a string variable as its key and a vector of objects as its value. I used a vector of objects as values because I append an object to the vector every time its respective key is already in the map.

My main function included the header files for the respective classes. I translated a python breadth-first search algorithm written by Dr. Ayorkor Korsah to c++. This algorithm was used to find the shortest path to get to the end destination from the start, It automatically finds an optimal path without calculating the distance in kilometers. The function that implemented the breadth-first search is called ‘findCode’. It takes the iata code of the start location and first checks if the code can be found in the Routes map. The function has a frontier deque to store all the child nodes and an explored vector to keep track of all the nodes that have already been explored.

The optimal path is written to an output file and shared with the user.

During the implementation of the code, I encountered several drawbacks. For example, I could not use a queue instead, a deque, and c++ had no implementation of a hashmap, so used a map instead.