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CS313: Intermediate Computer Programming

Individual Portfolio

Cohort A

30th September 2022

This project tested my capabilities in reading files, mainly as it contained some of the most extensive files I have ever had to work with. Initially, I struggled to represent all the information, as I immediately thought of using a graph structure. However, I had little experience with this data structure and encountered many issues. Subsequently, with the help of consultations from friends and the faculty intern, I got a better understanding of the problem. I decided to use HashMaps instead since they presented a better time complexity regarding retrieval. However, I still used the underlying principles of a graph, namely the adjacency list. This is because I was still mapping each airport to a list containing all the routes it can get to, essentially applying the principles of a graph. This project also made use of the breadth-first-search approach to find a goal state from a given initial state.

On a high level, the algorithm takes in a start and end destination. All the airport codes available in the start location are then generated and used for the search. For each airport, all the possible routes away from the airport are generated, and the destination of the routes is obtained. A check is made to see if this destination is the goal. If not, successive routes are generated, and the process continues until the goal is eventually reached. The solution path is generated and returned from the beginning to the goal. The project also involves reading and writing to files, as the start and goal locations are read from one file, and the solution path is written to another.

This project taught me a lot about data representation. It made me understand the value of getting a good way of storing information, and it also taught me the benefits of ensuring that methods have efficient time complexities to improve user experience generally.