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Reflection

This was a very challenging project. It helped me to re-apply my knowledge in Data structures and also to learn the particularities of C++.

I created 8 classes. Airlines, Airport, DataReader, Route, RouteFinder, Helpers, Node and main. The pipeline for my project was as follows:

1. An instance of the DataReader class reads the 3 csv source files. After reading each line, it calls the appropriate method to create an object of the respective class (Airport, Airline or Route). After creating the object, it adds it to the appropriate Map
2. The RouteFinder class then reads the users input file to get the start and end locations. From there, The RouteFinder converts the locations into nodes
3. The RouteFinder puts the nodes from step 2 on the frontier and performs a breadth first search. This search returns the destination in the form of a node.
4. The helper class is used to generate the solution path of the node, which is then written to a file.

This project was quite frustrating at times, mostly because of the “specific” nature of C++. Some standard template libraires didn’t have the methods you would expect them to, so I had to implement some of them myself before using them. For example, checking if a dictionary has a key. The lack of a concise HashMap and hash function also meant that I had to get creative with how I implemented my search algorithm. For example: Instead of using the hash value of nodes for the explored set, I used string representations of the nodes

One lesson I learned was that “Flexibility is important”. Initially, I tried to do a direct translation of the Java project into C++. However, I was met with several issues. As such, I had

to be flexible and completely rework some of the elements of my implementation. For example,I had to reimplement the Node class and BFS in a different manner to make use of pointers.

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References

GeeksforGeeks. 2022. *GeeksforGeeks | A computer science portal for geeks*. [online] Available at: <https://www.geeksforgeeks.org/> [Accessed 1 October 2022].