Mini-Project: Airline networks

Spring 2021

Part I
Airline networks

Implement a directed graph for flight routes using the data files here: https://github.com/datsoftlyngby/soft202
mal/tree/main/data/airlines The graph representation should be such that it is both efficient in terms of memory use and time taken to do the following operations:

1. Find if an airport can be reached from another using only a single airline company. You should compare Breath-First and Depth-First approaches.
2. Finding shortest path (distance) from one location to another (Dijkstra's algirithm)
3. Finding shortest path (time) from one location to another, assuming that each transfer takes one hour.
4. Finding airline that has widest coverage (Minimum Spanning Tree)
5. Defend the choice of datastructure with regard of time and space complexity (big O).

Part II
A-Star algorithm

Use your own implementation of the A* algorithm to find the shortest path between the 'S' character and the 'T' character in the three files here: https://github.com/datsoftlyngby/soft2021s
mal/tree/main/data/astar

In the txt files 'S' represenrts the start node, 'T' represents the target node, 'W' represents an impassable wall node and '*' represents a normal passable node. The maps are always rectangular, with the same number of characters on each line.

Part III
Hand-in

This assignment must be handed in on peergrade no later than May 30th 2021.