CS 372/469 – Spring 2022

Alternate Lab 4

Due: 04/25/2022 11:59 pm

For each of the following questions, write a successful running code in any programming language that you prefer. Your code should run without any errors for any *valid* input. **The total grade for this alternate lab is 50% of the Lab 4. Submit this only if you would like to replace your existing Lab 4 grade.**

All problems are borrowed from <https://www.techiedelight.com/graphs-interview-questions/>

**Question 1 (50 points):**

Given a directed graph (nodes and edges), check if it is strongly connected or not. A directed graph is said to be strongly connected if every vertex is reachable from every other vertex.

Source: <https://www.techiedelight.com/check-given-graph-strongly-connected-not/>

Format of the input:

***Input:*** *0 -> 1, 0 -> 2, 1 -> 2, 2 -> 0, 2 -> 3, 3 -> 3*

Your code should be able to traverse the above input format (e.g. *2 -> 0, 0 -> 2, 1 -> 2, 0 -> 1, 3 -> 3, 1 -> 3*) **from a given text file** and create edges in your data structure.

**Question 2 (50 points):**

Given a list of departure and arrival airports, find the itinerary in order. It may be assumed that departure is scheduled from every airport except the final destination, and each airport is visited only once, i.e., there are no cycles in the route.

Source: <https://www.techiedelight.com/find-itinerary-from-given-list-tickets/>

Format of the input:

***Input:*** *HKG —> DXB, FRA —> HKG, DEL —> FRA*

***Output****: DEL —> FRA —> HKG —> DXB*

Your code should be able to traverse the above input **from a given text file** and create edges in your data structure.

**Submission Instructions**: Put all your solutions in a properly commented file named *alternatelab4\_lastname\_firstname.EXTENSION*, where EXTENSION = the appropriate extension for the programming language that you chose.

Email your solutions to the TA ([lamia@nmsu.edu](mailto:lamia@nmsu.edu)) and cc me on it ([nagarkar@nmsu.edu](mailto:nagarkar@nmsu.edu))