CS 372/469 – Spring 2022

Alternate Lab 3

Due: 04/19/2022 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 3. Submit this only if you would like to replace your existing Lab 3 grade.**

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

**Question 1 (30 points):**

Given a directed graph (nodes and edges), return the adjacency matrix representation.

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 (30 points):**

Given a directed graph (nodes and edges), return the adjacency list representation.

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 3 (40 points):**

Given a directed graph (nodes and edges) and two vertices A and B (that exist in the given directed graph), find the path between A and B. If there is no path, output “I don’t like Patriots” – or whatever team you don’t like.

***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.

**Submission Instructions**: Put all your solutions in a properly commented file named *alternatelab3\_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))