

CSC210 Advanced Algorithm and Design Lab
13/03/2023

Time: 1 Hour
Marks: 100

Instructions

1. Write the programs with proper comments and indentation
2. Create a directory <Admission Number>_<Date> [21JEXXXX_090122], copy all the files into it and **upload in Google Class Room**
3. Submit a single C/C++ source file
4. Do not use STL calls
5. Each program should start with these comment lines:

/*

Name:

ID No:

*/

Q1. Consider a telephone network where vertices are switches and edges represent the IG value (maximum information gain that could be achieved if that path is chosen) between two switches. Find the path between any two vertices such that information gain is maximum. Information gain values are positive. Apply Dijkstra's algorithm for the task.

Write a function *Compute_IG* that takes the graph and two vertices as inputs and print the gain value, the path that leads to that value, and the number of comparisons required to find out the optimum path.

The **main()** function:

1. Take number of vertices and edges, edge weights and construct the graph. Also take the source and destination vertex. Call the function *Compute_IG*. [10]
2. *Compute_IG* computes the maximum gain value path [40]

Q2. Consider a network among the members of a team. Weights represent cooperation between two members. Weights might be positive or negative. Lower values present more cooperation.

Write a function *Compute_CO* that takes the graph, a specific user (s), find out the most cooperative paths with other team members.

The **main()** function:

1. Take number of vertices and edges, edge weights and construct the graph. Also take the source user. Call the function *Compute_CO* [10]
2. *Compute_CO* computes the cooperative paths with other members [40]