CSL 214 : Data Structures and Program Design II
Lab Assignment-3

1. Announcement Date: **23-05-2020**

2. Due date: Submit online by **12.00 noon on Wednesday 3rd June, 2020**

3. The assignment has to be done individually.

4. No Copying / sharing of code is allowed for the assignment. If any such case is identified, the original author and person who has copied both will be penalised equally and zero marks will be awarded.

5. You need to submit your source files by attaching them to a mail and sending it on **dspd.assignment@gmail.com** by the common deadline. Though viva may take place at different times for different students, the submission deadline is same for all. Please attach .txt, .c and .h files only. No .obj or.exe files should be attached. The subject should be marked as DSPD-2-Assignment-3: Your enrolment no.

6. Details regarding assignment viva will be announced later.

Assignment-3 Problem :

Implement a Graph data structure (preferable: adjacency list) and other support functions to perform following operations on the given graph (have a facility to input undirected/directed as well as weighted/unweighted graph as required).

1. Node operations: Add a node, Delete a node
2. Edge operations: Add an edge, Delete an edge
3. Display the graph via Depth First, Breadth First Traversals as well as Topological Sort
4. Detect whether the graph is connected or disconnected.
5. Shortest path between a fixed source to all other vertices. Note that path as well as path-cost to be calculated.
6. Shortest path between any pair of nodes. Note that path as well as path-cost to be calculated.
7. Searching a value in the graph via *breadth-first search* and *depth-first search*
8. Detect presence of a cycle in the graph
9. Calculate and display the minimum spanning tree
10. ** Display all possible paths between a pair of nodes

** Difficult