[CSL202]-Data Structures	2024-25-M

LAB-IX

Date: **Oct 24, 2024**.

You need to upload your solutions of Q1,Q2 and Q5 to canvas portal before 05:30pm on Oct 24, 2024.

1. Write a program that reads a list of edges and constructs both adjacency list representation and adjacency matrix representation of the graph.

   For example, if the edge list of a graph G is $L = [[1, 2], [2, 3]]$ then the graph has three vertices and two edges.

2. Write a program to implement the breadth-first search algorithm (BFS) and output the BFS tree. Assume that input is given as a adjacency list representation.

3. Write a program to compute the number of connected components in a undirected graph G. You can use the program written in Q2 as a subroutine to solve this problem.

4. Write a program to check whether a given graph is Bipartite or not. You can use the program written in Q2 as a subroutine to solve this problem.

5. The *transpose* of a directed graph $G = (V, E)$ is the graph $G^T = (V, E^T)$, where $E^T = \{(v, u) \mid (u, v) \in E(G)\}$. Thus, G^T is G with all its edges reversed. Write a program for computing G^T from G, for both the adjacency-list and adjacency-matrix representations of G.