Lab Assignment 01

Marks

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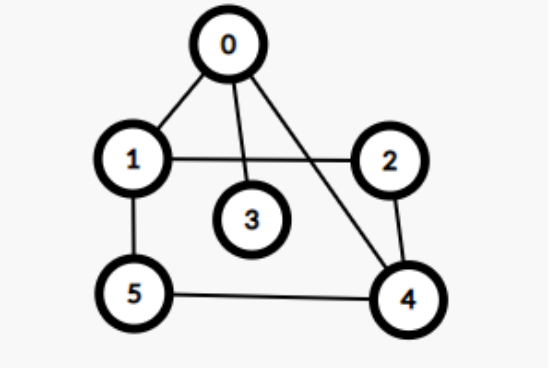
1) Write a c++ program to convert an Adjacency Matrix to an Adjacency List. **20**

Sample Input	Sample Output
6 0 1 1 0 0 0 1 0 0 1 1 0 1 0 0 0 0 1 0 1 0 0 1 1 0 1 0 1 0 0 0 0 1 1 0 0	0: 1 2 1: 0 3 4 2: 0 5 3: 1 4 5 4: 1 3 5: 2 3

2) Write a c++ program to solve the single source shortest path(SSSP) problem using **BFS**.
Consider 0 as the **source node**. **20**

Sample Input	**Sample Output**
	node 0 -> level: 0 node 1 -> level: 1 node 2 -> level: 2 node 3 -> level: 1 node 4 -> level: 1 node 5 -> level: 2

3) Write a c++ program to solve **cycle detection** in a **directed graph** using **DFS.** **20**

Sample Input	Sample Output
5 5 0 1 1 2 2 3 3 4 4 1	YES
5 4 0 1 1 2 2 3 3 4	NO

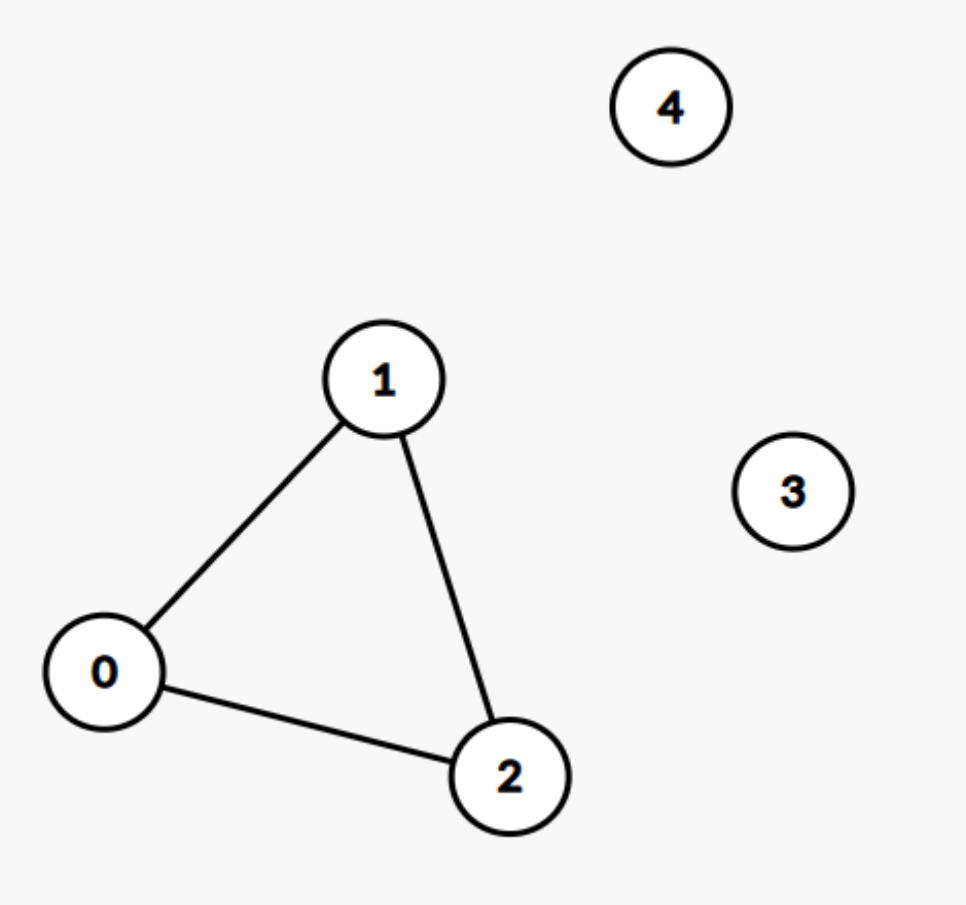
4) Write a c++ program to check if a graph is **Bipartite** or not. **20**

Sample Input	Sample Output
3 2 0 1 1 2	YES
3 3 0 1 1 2 2 0	NO

5) Write a c++ program to take an **undirected** graph as input and count the number of **connected** components in it. **20**

Sample Input	Sample Output
5 3 0 1 1 2 2 0	3

Explanations:



Sample Input graph is in above, we see that there are 3 components in this graph.