ADSA-2022 Lab Assignment – 09 **Date: 25-10-2022**

Instructions

1. This is an individual assignment.

2. Your code must completely be your own. You are not allowed to take guidance from any general-purpose code or problem specific code meant to solve these or related problems. Remember, it is easy to detect this kind of plagiarism.

3. All the PROBLEMS are COMPULSORY.

4. **Write only a single main function**. You can call the required functions from the main function.

4. Name the file as follows: S2021xxxxx_A09.c

5. DO NOT zip. **Upload a single .c file** directly to your submission in the common Google classroom.

Question 1: [2 points]

Write a function **`Read_Graph()`** that takes input in the following format: The first input will be an integer value n denoting the number of vertices in the graph (the vertices will be numbered from 1 to n). This will be followed by the edges in the graph. Every edge will be input by two values - its starting vertex and ending vertex. The list of edges will be terminated when the input received is "0 0". An example input is provided below:

```
5       //Number of vertices in the graph
1 2
2 3
3 4
1 4
0 0     //Signifies end of edges
```

Question 2: [5 points]

a. Write a function **`DFS()`** that performs DFS traversal on a given graph. The function simply prints the nodes visited by the traversal in the order in which they are visited. Assume that the starting vertex is vertex 1 and any ties are broken in favour of the node with the lower vertex index. **[3 points]**

b. Write a function **`IsConnected()`** that checks whether the given graph is connected or not. The function can just print "Connected" or "Not Connected". You can use the function written in the previous lab. **[2 points]**

Question 3: [3 points]

Write a function **`BFS()`** that performs BFS traversal on a given graph. Also print the shortest distance from the vertex 1 to every other vertex in the graph.

Note: Only call the function **`Read_Graph()`** once in the entire program. Your main function should call the functions **`DFS(), IsConnected()`** and **`BFS()`** on the same graph. You may reuse functions as and when necessary.