Indian Institute of technology, Guwahati
Department of Computer Science and Engineering
Data Structure Lab: (CS210)
Offline Assignment: 8
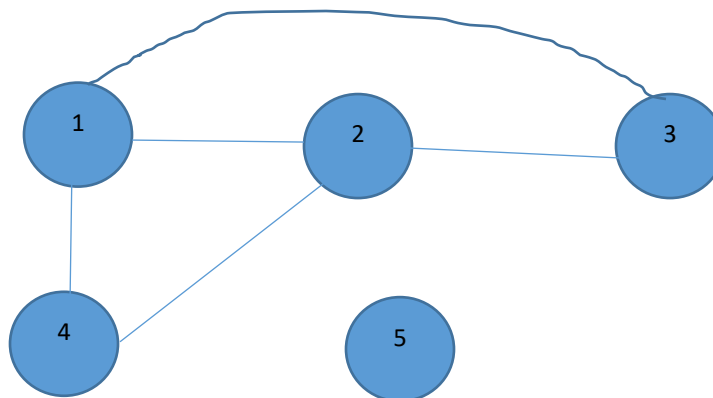
Date: 16ᵗʰ October 2017.   **Total Marks: 20**

Deadline: 10PM, 22nd October 2017. (Hard Deadline)

1. Let G = (V, E) be an **underlined** **undirected** graph. You are required to find out the connected components of G. Also if the graph has a cycle, you are required to print one such cycle. For this, read the number of nodes n, the number of edges e and then read in the list of edges from a file. Print the number of connected components and also print each connected component as a set of nodes. You are also required to list a cycle if it exists. Otherwise print that there are no cycles. You should test your program carefully on various kinds of inputs and present the test results. Use adjacency list to store this graph**.**

Marks Distributions: Finding connected components and print them: 10, Finding cycles and print cycles: 10)

Note: The below data is based on the following graph. You need to identify two cycles as shown above.

Input Format:

<no of nodes n > <no of edges e> next e lines for e edges of the form <u, v>	Example: 5 6 1, 2 3, 1 4, 2

	2, 3
	1, 4

Output:
The number of connected components: 2
    Connected components 1: 1 2 3 4
    Connected components 2: 5
The number of cycles: 2
    Cycle 1: 1 3 2 1
    Cycle 2: 1 4 2 1