Data Structures and Algorithms Lab

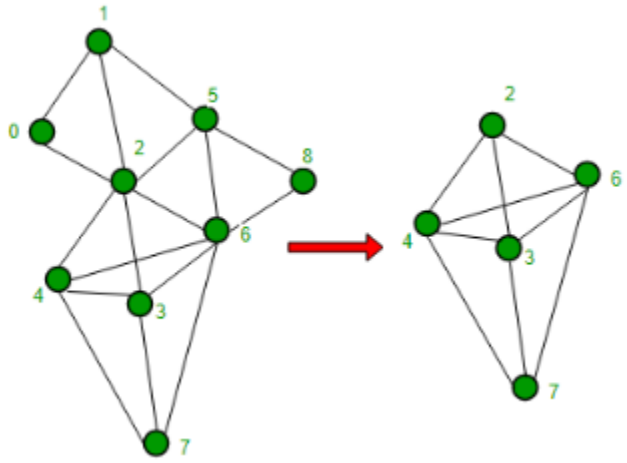
Lab Test - V2

Maximum Marks: 20 **Max Time: 40 minutes**

SET – A

Take an undirected Graph G and a number N. Your task is to generate an output graph (G') in which all the vertices less than degree N will be removed from G. Make sure that graph G' contains connected components only.

For example, if N=3 and below left graph is considered as input then the right graph will be the output. As we can see in the output graph no vertex is having a degree less than 3.



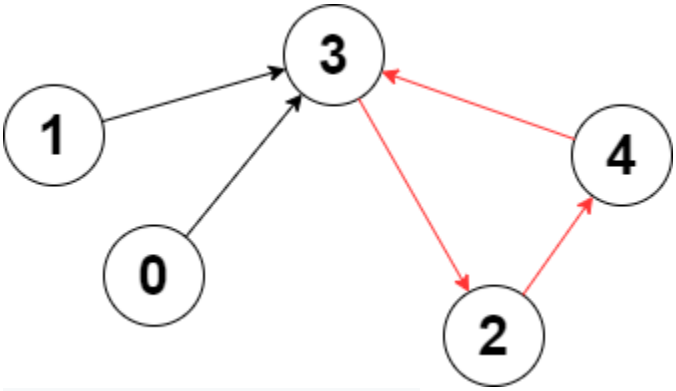
G G'

SET – B

Implement a graph with n vertices numbered as 0 to n-1 where every vertex can have maximum one outgoing edge. The graph can be represented by single dimensional array **edges** of size n, indicating that there is a directed edge from node `i` to node `edges[i]`. If there is no outgoing edge from node `i`, then `edges[i] == -1`.

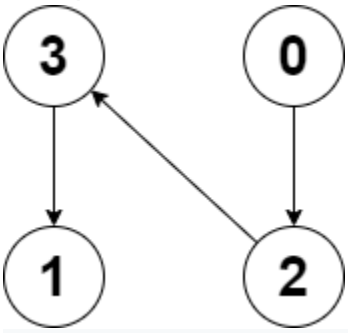
Considering the above representation of the graph, display the longest cycle in the graph and print its length. If no cycle exists, return `-1`.

Example 1:




```
Input: edges = [3,3,4,2,3]
Output: 3
Explanation: The longest cycle in the graph is the cycle: 2 -> 4 -> 3 -> 2.
The length of this cycle is 3, so 3 is returned.
```

Example 2:




```
Input: edges = [2,-1,3,1]
Output: -1
Explanation: There are no cycles in this graph.
```