Islands

Problem Level: Medium

Problem Description:

An island is a small piece of land surrounded by water . A group of islands is said to be connected if we can reach from any given island to any other island in the same group . Given V islands (numbered from 1 to V) and E connections or edges between islands. Can you count the number of connected groups of islands.

Sample Input 1:

```
5 8
0 1
0 4
1 2
2 0
2 4
3 0
3 2
4 3
```

Sample Output 1:

```
1
```

Approach to be followed:

The idea behind this question is to find out the number of connected components(islands) and return the count. For every vertex check if the vertex has not been visited, perform DFS/BFS to get all the connected components and increment count by 1. A helper function is used which will check for all the connected components and mark them as visited.

Steps:

1. Create an adjacency Matrix for all the vertices of the graph.
2. Create a helper function to mark the current vertex visited and recursively for the adjacent vertices until all the adjacent vertices are marked as visited.

3. Create a count variable to store the count of connected islands.
4. For all the vertices, Check if it is not visited, call the helper function and increment the count by 1.
5. Return count.

Pseudo Code:

```
Function helper(graph,u,visited,currentvertex )

     visited[currentvertex]= True

     Loop from i=0 till i less than v

         if(graph[currentvertex][i] and is not visited)

           helper(graph,v,visited,i)


Function solve(graph,v)

     visited [] // Create a boolean visited array

     count = 0

     Loop from i=0 till i less than v

           if(!visited[i])

                helper(graph,v,visited,i)

                count = count + 1

     return count;
```

Time Complexity: O(V + E) as DFS is used to find the connected components.