

Graph-02 Questions

Question 1 :

Mother Vertex

We have a Directed Graph, find a Mother Vertex in the Graph (if present). A Mother Vertex is a vertex through which we can reach all the other vertices of the Graph.

Input :



Output : 0

Question 2 :

Union-Find

Here implement Union-Find Algorithm to check whether an undirected graph contains cycle or not.

Sample Input 1 :



Sample Output 1 : Yes

Question 3 :

Find whether it is possible to finish all tasks or not

There are a total of n tasks you have to pick, labelled from 0 to $n-1$. Some tasks may have prerequisites, for example to pick task 0 you have to first pick task 1, which is expressed as a pair: [0, 1] Given the total number of tasks and a list of prerequisite pairs, is it possible for you to finish all tasks?.

Sample Input 1 : [[1, 0], [0, 1]]

Sample Output 1 : false

Sample Input 2 : [[1, 0]]

Sample Output 2 : true

Question 4 :**Alien Dictionary**

We have a sorted dictionary of an alien language having N words and k starting alphabets of standard dictionary. Find the order of characters in the alien language. Many orders may be possible for a particular test case, thus you may return any valid order and output will be 1 if the order of string returned by the function is correct else 0 denoting incorrect string returned.

Sample Input 1 :

$N = 3, K = 3$

dict = {"caa", "aaa", "aab"}

Sample Output 1 : 1

Sample Input 2 :

$N = 5, K = 4$

dict = {"baa", "abcd", "abca", "cab", "cad"}

Sample Output 2 : 1

Question 5 :**Find number of closed islands**

We have a binary matrix $mat[][]$ of dimensions $N \times M$ such that 1 denotes land and 0 denotes water. Find the number of closed islands in the given matrix.

A closed island is known as the group of 1s that is surrounded by only 0s on all the four sides (excluding diagonals). If any 1 is at the edges of the given matrix then it is not considered as the part of the connected island as it is not surrounded by all 0's.

Sample Input 1 :

$N = 3, M = 3$

$\text{mat} = \{\{1, 0, 0\},$
 $\{0, 1, 0\},$
 $\{0, 0, 1\}\}$

Sample Output 1 : 1

Sample Input 2 :

$N = 5, M = 8$

$\text{mat} = \{\{0, 0, 0, 0, 0, 0, 0, 1\},$
 $\{0, 1, 1, 1, 1, 0, 0, 1\},$
 $\{0, 1, 0, 1, 0, 0, 0, 1\},$
 $\{0, 1, 1, 1, 1, 0, 1, 0\},$
 $\{0, 0, 0, 0, 0, 0, 0, 1\}\}$

Sample Output 2 : 2