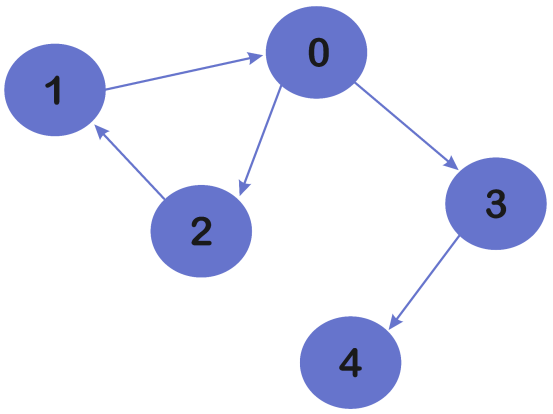
Graph-02 Questions

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 :



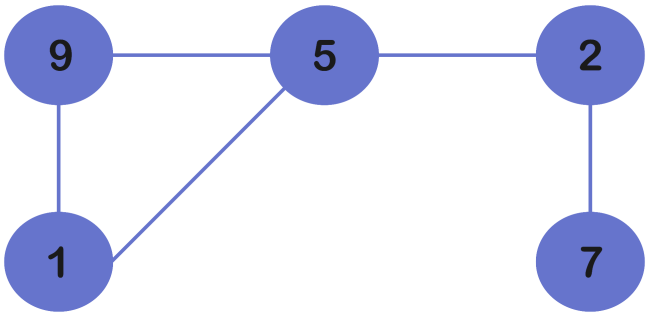
Output : 0

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 NxM 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
mat[][] = {{1, 0, 0},
{0, 1, 0},
{0, 0, 1}}
Sample Output 1 : 1

Sample Input 2 :

```
N = 5, M = 8
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