D - Reachability Query 2   Editorial (/contests/abc435/tasks/abc435_d/editorial)

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Time Limit: 3 sec / Memory Limit: 1024 MiB

Score : 425 points

Problem Statement

You are given a directed graph with N vertices and M edges.

The vertices are numbered from 1 to N, and the i-th edge is a directed edge from vertex X_i to vertex Y_i.

Initially, all vertices are white.

Process Q queries in order. Each query is of one of the following two types:

- `1 v`: Color vertex v black.
- `2 v`: Determine whether it is possible to reach a black vertex by following edges from vertex v.

Constraints

- $1 \le N \le 3 \times 10^5$
- $0 \le M \le 3 \times 10^5$
- $1 \le Q \le 3 \times 10^5$
- $1 \le X_i, Y_i \le N$
- There are no self-loops, that is, $X_i \ne Y_i$.
- There are no multiple edges, that is, (X_i, Y_i) are distinct.
- In queries, $1 \le v \le N$.
- All input values are integers.

Input

The input is given from Standard Input in the following format:

$$N \quad M$$
$$X_1 \quad Y_1$$
$$\vdots$$
$$X_M \quad Y_M$$
$$Q$$
$$\text{query}_1$$
$$\vdots$$
$$\text{query}_Q$$

query_i represents the i-th query and is given in one of the following formats:

```
1  v
```

```
2  v
```

Output

Let q be the number of queries of the second type. Output q lines.

The i-th line should contain Yes if a black vertex is reachable in the i-th query of the second type, and No otherwise.

Sample Input 1   Copy

```
5 6
1 2
2 3
3 1
4 5
1 4
2 5
5
1 3
2 1
2 4
1 5
2 4
```

## Sample Output 1 <kbd>Copy</kbd>

```
Yes
No
Yes
```

- Initially, the given graph is as shown in the leftmost figure below.
- By the first query, vertex 3 becomes black, as shown in the center figure.
- In the second query, it is possible to reach black vertex 3 from vertex 1.
- In the third query, it is not possible to reach a black vertex from vertex 4.
- By the fourth query, vertex 5 becomes black, as shown in the rightmost figure.
- In the fifth query, it is possible to reach black vertex 5 from vertex 4.
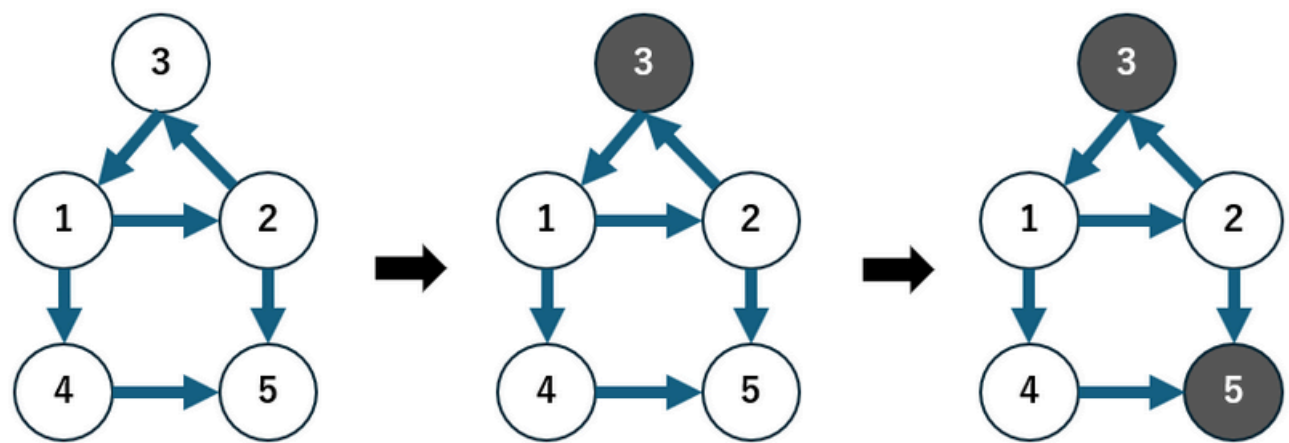
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