

Contest Duration: 2025-12-06(Sat) 23:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251206T2100&p1=248>) - 2025-12-07(Sun) 00:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251206T2240&p1=248>) (local time) (100 minutes)

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D - Reachability Query 2

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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

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

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Input

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

```
N  M
X1  Y1
:
XM  YM
Q
query1
:
queryQ
```

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

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```
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
```

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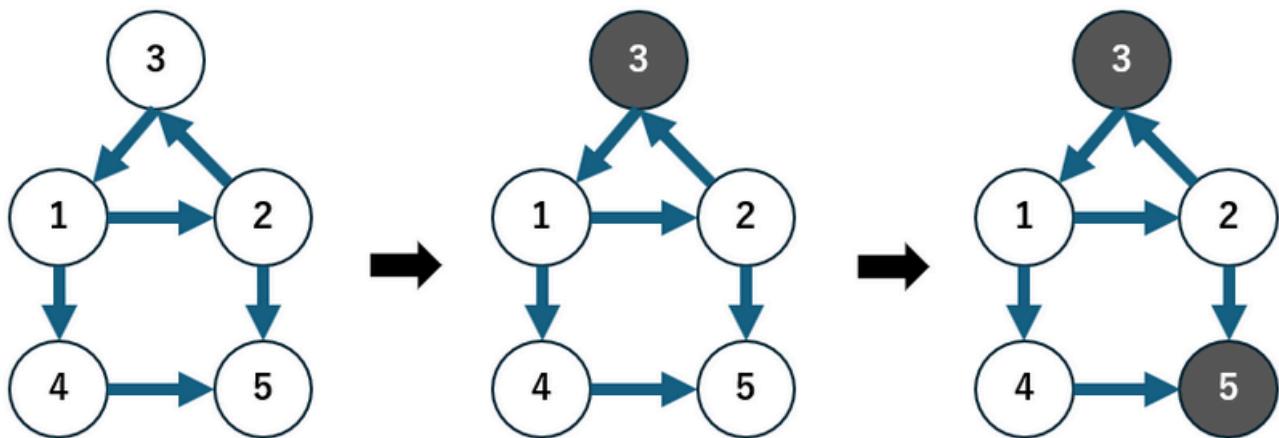
Sample Output 1

Copy

Yes
No
Yes

Copy

- 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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