→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

D. Bosses

time limit per test: 2 seconds

memory limit per test: 64 megabytes

There are n employees in a company, and in the current moment no one is a subordinate of any other one. That is, each employee is a boss of himself. We call a person a boss, if he is not a subordinate of anybody else.

You are to process two types of queries:

- boss a becomes a subordinate of boss b (and no longer is a boss),
- given an employee c, what is the number of his superiors we should pass to reach a boss?

In a query of the second type, if c is a boss, the answer is 0, otherwise it is some positive integer — the "depth" of the employee.

Write a program that processes the queries.

Input

The first line contains two integers n and m ($1 \le n, m \le 3 \cdot 10^5$) — the number of employees and the number of queries, respectively.

The next m lines contain the queries. A query of the first type is described as "`1 a b`" ($1 \le a \ne b \le n$), where a and b are bosses. A query of the second type is described as "`2 c`" ($1 \le c \le n$).

Output

Print a line for each query of the second type, containing the answer for this query.

Examples

input Copy

```
10 20
1 9 4
1 2 6
2 10
1 10 5
2 5
1 7 4
1 8 5
2 1
1 6 5
1 3 5
1 1 4
1 5 4
2 7
2 2
2 4
2 3
2 4
2 2
2 2
2 10
```

output Copy

```
0
0
0
1
3
0
2
0
3
3
2
```