

Merging Communities

People connect with each other in a social network. A connection between Person i and Person j is represented as $M\ i\ j$. When two persons belonging to different communities connect, the net effect is the merge the communities which i and j belong to.

At the beginning, there are n people representing n communities. Suppose person **1** and **2** connected and later **2** and **3** connected, then **1,2**, and **3** will belong to the same community.

There are two types of queries:

1. $M\ i\ j \implies$ communities containing persons i and j are merged if they belong to different communities.
2. $Q\ i \implies$ print the size of the community to which person i belongs.

Input Format

The first line of input contains 2 space-separated integers n and q , the number of people and the number of queries.

The next q lines will contain the queries.

Constraints

$$1 \leq n \leq 10^5$$

$$1 \leq q \leq 2 \times 10^5$$

Output Format

The output of the queries.

Sample Input

STDIN Function ----- 3 6 n = 3, q = 6 Q 1 print the size of the community containing person 1 M 1 2 merge the communities containing persons 1 and 2 ... Q 2 M 2 3 Q 3 Q 2

Sample Output

```
1
2
3
3
```

Explanation

Initial size of each of the community is 1.