Union-Find

Time limit: 1 second / Memory Limit: 256 MB

Problem Description

Your task in this problem is to read the Disjoint-set data strucutre (also known as union-find data structure) and implement it!

The input starts with two integers n and m, where n denotes the number of elements, and m denotes the number of queries you need to process in your program. It is guaranteed that $1 \leq n \leq 10^5$ and $1 \leq m \leq 10^5$.

The elements are numbered using integers from 1 to n, and initially, each element belongs to a unique set that contains only the element itself.

Each query consists of a character and two integers, separated by a space. Depending on the leading character, there are two type of queries:

- "m a b" - This query is to union the set which contains element a and the set which contains element b.
- "? a b" - This query is to check whether two elements a and b are in the same set. If they are, print in a line the character 'Y'. Otherwise, print 'N'.

Sample Input	Sample Output
6 7 m 3 2 m 5 3 ? 2 3 ? 6 1 m 6 1 ? 1 6 ? 2 5	Y N Y Y