

## Problem K: Equal or Not Equal

- Time Limit: 3 sec

### Problem Statement

There are  $N$  integer variables  $a_1, \dots, a_N$ . All the initial values are unspecified. You have to process  $M$  events in order, each of which is an observation event, a change event or an inquiry event.

One kind of an observation event has the format,

1  $x$   $y$

which represents that it is observed that  $a_x$  and  $a_y$  are equal. In other words, after this event it is guaranteed that these two variables have the same value unless there is a change event for either variable.

The other kind of an observation event has the format,

2  $x$   $y$

which represents that it is observed that  $a_x$  and  $a_y$  are not equal.

A change event has the format,

3  $x$

which represents that the value of  $a_x$  changes to a different integer.

Finally, an inquiry event has the format,

4  $x$   $y$

which asks whether  $a_x$  and  $a_y$  are equal. If it can be proven from all the past events that  $a_x$  and  $a_y$  are equal, you have to print **Yes**. Similarly, if it can be proven that  $a_x$  and  $a_y$  are not equal, you have to print **No**. If neither can be proven, you have to print **Unknown**.

### Input

The input consists of a single test case of the following format, where all values in the input are integers.

$N$   $M$   
event<sub>1</sub>  
:  
event <sub>$M$</sub>

The integer  $N$  is the number of variables ( $1 \leq N \leq 10^6$ ). The integer  $M$  is the number of events ( $1 \leq M \leq 500,000$ ).

$M$  events are given in chronological order. The format of each event is explained above. In an observation event or an inquiry event, it is guaranteed that  $1 \leq x < y \leq N$ . In a change event it is guaranteed that  $1 \leq x \leq N$ .

At any point, it is guaranteed that there is at least one assignment to all  $N$  variables that contradicts none of the given information.

### Output

For each inquiry event, print **Yes**, **No** or **Unknown** followed by a newline.

**Sample Input**

```
4 11
1 1 2
4 1 2
2 3 4
4 3 4
4 1 3
1 1 3
4 1 3
4 1 4
3 1
4 1 3
4 1 4
```

**Sample Output**

```
Yes
No
Unknown
Yes
No
No
Unknown
```