IOITC 2016 TST Day 2

Crazy Man and Good Arrays

One day, Crazy Man was playing in the sandbox. Unfortunately, he got bored, as he didn't have enough creativity to make a beautiful sandcastle. Instead, he decided to play with arrays. Now Crazy Man has an array A of N elements. Initially all the elements of A are zero. He also has another array B, of N elements. Now he wants to perform Q operations on the array A. He has two types of updates, of the form:

- add $x \times B_i$ to A_i for all i in the range $[l, r]$
- add y to A_i for all i in the range $[l, r]$

Crazy Man calls an array *good* if all the elements in the array are in the range $[-10^9, +10^9]$. At certain points of time, Crazy Man wants to know, for the range $[l, r]$, if there exists some good array B, such that the subarray $A_l, A_{l+1}, \ldots A_r$ is a good array after performing all the updates so far. Note that each query of this form is independent, i.e. the array B can be different for each query.

Now Crazy Man is getting bored as he doesn't know how to answer these queries. Solve it for him, so he doesn't have to face boredom again!

Note: $[a, b]$ refers to the range $a, a+1, \ldots b$ (it is inclusive of both a and b)

Input

The first line contains N and Q.
Each of the next Q lines is of one of the following forms:

- 1 l r x, meaning you have to add $x \times B_i$ to A_i for all i in the range $[l, r]$
- 2 l r y, meaning you have to add y to A_i for all i in the range $[l, r]$
- 3 l r, meaning you have to answer the query for the range $[l, r]$

Output

For each query, print `YES` if such an array B exists, and `NO` otherwise.

Test Data

$1 \leq N \leq 10^5$
$1 \leq Q \leq 2 \times 10^5$
For all types of operations, $1 \leq l \leq r \leq N$.
For operations of the form 1 l r x, $0 \leq x \leq 10^4$.
For operations of the form 2 l r y, $-10^4 \leq y \leq +10^4$.

Subtask 1 (13 Points):
$1 \leq N \leq 500$

Subtask 2 (87 Points):
No additional constraints.

Sample Input

```
5 6
1 3 5 4
2 2 4 8
1 4 5 0
3 1 5
2 2 5 -20
3 1 1
```

Sample Output

```
YES
YES
```

Limits

Time: 2 seconds

Memory: 256 MB