

# Wall

TIME LIMIT: 3s  
MEMORY LIMIT: 2048MB

Jian-Jia is building a wall by stacking bricks of the same size together. This wall consists of  $n$  columns of bricks, which are numbered 0 to  $n - 1$  from left to right. The columns may have different heights. The height of a column is the number of bricks in it.

Jian-Jia builds the wall as follows. Initially there are no bricks in any column. Then, Jian-Jia goes through  $k$  phases of *adding* or *removing* bricks. The building process completes when all  $k$  phases are finished. In each phase Jian-Jia is given a range of consecutive brick columns and a height  $h$ , and he does the following procedure:

- In an *adding* phase, Jian-Jia adds bricks to those columns in the given range that have less than  $h$  bricks, so that they have exactly  $h$  bricks. He does nothing on the columns having  $h$  or more bricks.
- In a *removing* phase, Jian-Jia removes bricks from those columns in the given range that have more than  $h$  bricks, so that they have exactly  $h$  bricks. He does nothing on the columns having  $h$  bricks or less.

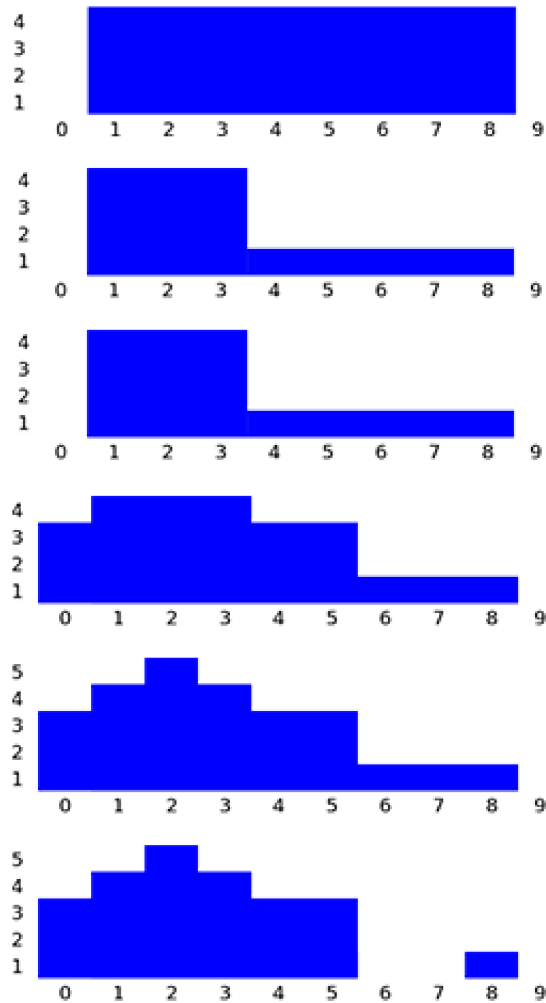
Your task is to determine the final shape of the wall.

## EXAMPLE

We assume that there are 10 brick columns and 6 wall building phases. All ranges in the following table are inclusive. Diagrams of the wall after each phase are shown below.

| phase | type   | range          | height |
|-------|--------|----------------|--------|
| 0     | add    | columns 1 to 8 | 4      |
| 1     | remove | columns 4 to 9 | 1      |
| 2     | remove | columns 3 to 6 | 5      |
| 3     | add    | columns 0 to 5 | 3      |
| 4     | add    | column 2       | 5      |
| 5     | remove | columns 6 to 7 | 0      |

Since all columns are initially empty, after phase 0 each of the columns 1 to 8 will have 4 bricks. Columns 0 and 9 remain empty. In phase 1, the bricks are removed from columns 4 to 8 until each of them has 1 brick, and column 9 remains empty. Columns 0 to 3, which are out of the given range, remain unchanged. Phase 2 makes no change since columns 3 to 6 do not have more than 5 bricks. After phase 3 the numbers of bricks in columns 0, 4, and 5 increase to 3. There are 5 bricks in column 2 after phase 4. Phase 5 removes all bricks from columns 6 and 7.



## TASK

Given the description of the  $k$  phases, please calculate the number of bricks in each column after all phases are finished.

## INPUT

The first line contains two integers  $n$  and  $k$ : the number of columns of the wall and the number of phases ( $1 \leq n \leq 2,000,000$ ;  $1 \leq k \leq 500,000$ ).

Line  $2 + i$  ( $0 \leq i \leq k - 1$ ) contains four integers `op[i]`, `left[i]`, `right[i]` and `height[i]`:

- `op[i]` is the type of phase  $i$ : 1 for an adding phase and 2 for a removing phase.
- the range of columns in phase  $i$  starts with column `left[i]` and ends with column `right[i]` (including both endpoints `left[i]` and `right[i]`). You will always have `left[i] ≤ right[i]`.
- `height[i]` is the height parameter of phase  $i$ .

The height parameters of all phases are nonnegative integers less or equal to 100,000.

**OUTPUT**

Output  $n$  lines: line  $1 + i$  ( $0 \leq i \leq n - 1$ ) contains the final number of bricks in column  $i$ .

**SAMPLES**

| Sample input 1 | Sample output 1 |
|----------------|-----------------|
| 10 6           | 3               |
| 1 1 8 4        | 4               |
| 2 4 9 1        | 5               |
| 2 3 6 5        | 4               |
| 1 0 5 3        | 3               |
| 1 2 2 5        | 3               |
| 2 6 7 0        | 0               |
|                | 0               |
|                | 1               |
|                | 0               |