Azalea Garden

Input file:	`standard input`
Output file:	`standard output`
Time limit:	6 seconds
Memory limit:	512 megabytes

In a serene garden of azaleas, n dangerous creatures have appeared. Each creature possesses an *attack power* and a *defense power*. Initially, the i-th creature ($1 \le i \le n$) has an attack power of a_i and a defense power of b_i.

You, the guardian of the azalea garden, can mentally imagine a *war* between them. A *war* consists of several (possibly, 0) *battles*. In each imagined *battle*, you choose two living creatures i and j ($1 \le i, j \le n$, $i \ne j$), and:

- If the attack power of creature i is greater than or equal to the defense power of creature j (i.e. $a_i \ge b_j$), then i can defeat j in the battle, and j is considered eliminated.
- Otherwise, nothing happens.

Note that the *wars* are imaginary; that is, a creature eliminated cannot be used for future *battles* in the same *war*, but it regains its vigor at the beginning of the next *war*, and thus can participate in future *battles* of consequent *wars*.

The creatures are volatile and undergo mutations over time. You are given q mutations. After each of the mutations, the attributes of a creature change. Specifically, in the i-th mutation, the v_i-th creature has its attack power updated to x_i and its defense power updated to y_i. Note that the mutations are persistent; After the i-th mutation, the impacts of the first $i-1$ mutations are accumulated.

Since each remaining creature poses an ongoing threat to the flowers, you want to find the minimum possible number of creatures that remain after an optimal sequence of an imagined *war*. You need to answer the question for all states before all mutations and after each mutation.

Input

The first line of the input contains two integers n and q ($1 \le n \le 4 \cdot 10^5$, $0 \le q \le 4 \cdot 10^5$), where n is the number of creatures and q is the number of mutations.

The next n lines of the input describe all the creatures. The i-th line of these contains two integers a_i and b_i ($1 \le a_i, b_i \le 10^9$), where a_i is the attack power and b_i is the defense power of the i-th creature.

The next q lines of the input describe all the mutations. The i-th line of these contains three integers v_i, x_i, and y_i ($1 \le v_i \le n$, $1 \le x_i, y_i \le 10^9$), where x_i is the new attack power of creature v_i and y_i is the new defense power of creature v_i.

Output

Output $q+1$ lines, each containing a single integer, which are the answers before any mutations and after each mutation in sequence.

Example

standard input	standard output
3 1 1 1 2 2 3 3 2 2 4	1 2

Note

In the example, before the mutations begin, the third creature can defeat the first and second creatures. Clearly, this is the optimal sequence of imagined battles, so the answer is 1.

After the first mutation ends, the attack power of the second creature becomes 2, and its defense power becomes 4. Now the third creature can only defeat the first creature, leaving 2 creatures remaining. It can be proved that no better solution exists, so the answer is 2.