Problem I. Quartz Collection

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

There is a shop selling n types of quartz in Byteland. Only two pieces of each type of quartz will be on sale every day, and the second piece will be on sale **only after** the first piece has been sold.

Two wizards Alice and Bob are collecting these n types of quartz to strengthen their wand. Due to the quartz shortage, they reach an agreement that either of them buy only one piece of each type each day.

Both of them wants to minimize their own cost each day. To reflect fairness, Alice buys one piece of quartz first, and then Bob and Alice buy two pieces in turn until only one piece remains. The one who still hasn't collected all types of quartz buys the last piece.

In each of the following m days, the prices of the two pieces of one type of quartz will change **permanently**, and Alice wants to know the minimum cost for her to collect all types of quartz if both Alice and Bob take the best strategy on the first day and each of the following m days.

Input

The first line contains two integers n and m ($1 \le n, m \le 10^5$), indicating the number of types of quartz and the number of following days.

Then n lines follow, the i-th of which contains two integers a and b ($1 \le a, b \le 10^5$), indicating the prices of the first piece and the second piece of the i-th type of quartz on sale respectively.

Then m lines follow, each line contains three integers t ($1 \le t \le n$), x and y ($1 \le x, y \le 10^5$), indicating that the prices of the first piece and the second piece of the t-th type of quartz on sale will change to x and y respectively.

Output

Output $m + 1$ lines, each containing a single integer, indicating the minimum cost for Alice to collect all types of quartz on the first day and each of the following m days.

Example

standard input	standard output
4 5 2 4 5 7 1 7 2 1 4 5 2 1 6 2 4 4 3 2 1 3 3 6 6	13 14 15 14 10 13

Note

In the sample case, one of the best strategies on the first day is as follows:

- Alice buys the first piece of the third type of quartz.
- Bob buys the first piece of the first type and the second type.
- Alice buys the second piece of the first type and the second type.
- Bob buys the second piece of the third type and the first piece of the fourth type.
- Alice buys the second piece of the fourth type, which is also the last piece of quartz.