Steal Them All

There are n objects, labeled from 1 to n. A thief wants to steal some of these objects. Each object i ($1 \leq i \leq n$) is associated with two values:

- $t[i]$ – the type of the object.
- $p[i]$ – the price of the object estimated by the thief.

At each minute, the thief can choose two integers l, r ($l \leq r$) and take exactly one object of type i for all $l \leq i \leq r$, and keep them in his bag. Note that he cannot take the same object more than once.

However, the thief will change his estimation q times. Change i ($1 \leq i \leq q$) is expressed as two integers $x[i]$ and $y[i]$. It means that the object $x[i]$ will have its estimated price changed to $y[i]$. After that, the thief wants to know what is the maximum total price he can get if he has no more than $m[i]$ minutes to steal.

Note that the changes are persistent (any change stays for the future).

Input

Read the input from the standard input in the following format:

- line 1: n q
- line $1+i$ ($1 \leq i \leq n$): $t[i]$ $p[i]$
- line $1+n+i$ ($1 \leq i \leq q$): $x[i]$ $y[i]$ $m[i]$

Output

Write the output to the standard output in the following format:

- line i ($1 \leq i \leq q$): maximum total price the thief can get after change i, if he has no more than $m[i]$ minutes to steal.

Constraints

- $1 \leq n \leq 100\,000$
- $1 \leq q \leq 1000$
- $1 \leq t[i] \leq 2n$ (for all $1 \leq i \leq n$)
- $0 \leq p[i] \leq 10^9$ (for all $1 \leq i \leq n$)

- $1 \leq x[i], m[i] \leq n$ (for all $1 \leq i \leq q$)
- $0 \leq y[i] \leq 10^9$ (for all $1 \leq i \leq q$)

Subtasks

1. (9 points) $n \leq 1000$, $q \leq 100$ and $t[i] = t[j]$ (for all $1 \leq i < j \leq n$)
2. (7 points) $t[i] = t[j]$ (for all $1 \leq i < j \leq n$)
3. (7 points) $t[i] \neq t[j]$ (for all $1 \leq i < j \leq n$)
4. (18 points) $n \leq 1000$, $q \leq 100$
5. (30 points) $n \leq 10\,000$, $q \leq 100$
6. (29 points) No further constraints.

Examples

Example 1

```
7 1
5 50
1 10
4 10
1 40
5 40
6 1
2 1
3 1000 2
```

The correct output is:

```
1092
```

After change 1, the price of object 3 is changed to 1000, and the thief has 2 minutes to steal.

- In the first minute, the thief can take $(l, r) = (4, 6)$ and choose objects $1, 3, 6$ with types $5, 4, 6$ and prices $50, 1000, 1$ respectively.
- In the second minute, the thief can take $(l, r) = (1, 2)$ and choose objects $4, 7$ with types $1, 2$ and prices $40, 1$ respectively.

So, the total price he gets is $50 + 1000 + 1 + 40 + 1 = 1092$. Among all the possible ways the thief can steal the objects, this is the maximum possible price he can get. So, 1092 is the answer.

Example 2

```
5 4
1 100
1 10
2 1
3 10
3 12
1 100 2
1 200 3
5 9 2
5 9 1
```

The correct output is:

```
123
233
221
211
```