Problem 2   Escape from Zorg[1]

Alas, Kbinoi's fears have come true. The state of Zorg, inspite of its great technological achievements, is crumbling under the weight of its corrupt state machinery, which includes the local police force. Our tale begins in these depressing circumstances.

The King of Zorg, intoxicated by power, has ordered the arrest of Kbinoi for his latest artistic creation that portrays the King as a clown wearing striped orange pants. Kbinoi realises that his only hope to escape the dungeons of Zorg (and avoid being subjected to endless reruns of *Friends*) is the 27th generation superhighway built from Zorg to the neighbouring Groz.

The only way to travel along this highway is through N teleporters $1, 2, \ldots, N$. Teleporter 1 is in the center of Zorg, from where Kbinoi has to plot his escape, and teleporter N is Groz, his destination. For each teleporter $i > 1$, there is a designated value $left(i) < i$. It is possible to teleport oneself from any teleporter k in the interval $left(i) \leq k \leq i$ to teleporter i. So, Kbinoi could start at teleporter 1 and teleport himself repeatedly to get to Groz. But, …

…there are a number of policemen patrolling the superhighway. There are exactly P of them, numbered $1, \ldots, P$, and for each of them we are given a description of his beat. The beat of policeman i covers a range (s_i, e_i) of teleporters, with $1 \leq s_i \leq e_i \leq N$. Anyone moving from teleporter j to teleporter k in this range—that is, $s_i \leq j \leq k \leq e_i$—will be caught by the policeman and released only on payment of a bribe b_i, which is also known. Notice that a pair of teleporters might lie within the beats of a number of policemen and one has to bribe them all unless one wants to end up in the dungeon of Zorg (which might be enticing to a hobo who likes to watch *Friends*, but Kbinoi is of keen intellect and would prefer death to dishonour).

For instance suppose there are 5 teleporters and 3 policemen, as follows:

Teleporters:

i	$left(i)$
2	1
3	1
4	3
5	3

Policemen:

j	s_j	e_j	b_j
1	1	4	6
2	2	3	8
3	3	5	10

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[1]Problem formulated by Srivatsan.

In this case, one can escape along the route $1 \rightarrow 3 \rightarrow 5$ by paying a bribe of 6 to policeman 1 for the move $1 \rightarrow 3$ and a bribe of 10 to policeman 3 for the move $3 \rightarrow 5$. In this example, 16 is the minimum bribe needed to escape.

In general, Kbinoi would like to calculate the minimum total bribe he would have to pay to escape from the clutches of his tormenters on Zorg.

Input format

The first line of input contains two integers N and P, the number of teleporters and the number of policemen. This is followed by $N - 1$ lines with one integer each, specifying the values of $left(i)$ for each teleporter $i \in \{2, 3, \ldots, N\}$. The next P lines contain 3 integers each, specifying the left and right endpoints s_i and e_i of the beat of policeman i as well as the bribe b_i he expects, for each policeman $i \in \{1, 2, \ldots, P\}$.

Output format

A single integer, the minimum total bribe that Kbinoi has to pay to escape.

Test Data

You may assume that $2 \leq N \leq 10^5$ and $1 \leq P \leq 10^5$. In inputs worth at least 40% of the marks, $2 \leq N \leq 5000$ and $1 \leq P \leq 5000$. All numbers in the input fit in 32-bit signed integers. The answer may need 64-bit signed integers.

Sample input

```
5 3
1
1
3
3
1 4 6
2 3 8
3 5 10
```

Sample output

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16
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Time and memory limits

The time limit for this task is 3 seconds. The memory limit is 76 MB (actual limit 64 MB, plus 12 MB buffer for 64-bit compilation).