Scoazze (scoazze)

Carlo, as many other people in Provincia di Treviso, produces a lot of rubbish with each activity he carries out during his day. Still, he is a strong advocate of separate waste collection, and for this reason he has N trash bins at home, indexed from 0 to $N-1$, each one for a different type of garbage (plastic, cans, glass, ...).
Every trash bin has a capacity of C_i bags, that can never be exceeded, otherwise Treviso's image would be hurt. Fortunately, every night the *S.A.V.N.O.*[1] garbage truck passes by and can completely empty a **single continuous interval** of trash cans, removing all of their contents. Note that the garbage truck can clear at most one interval per night.

Figure 1: The so called *neturbìn* that empties some of Carlo's trash bins every night.

Obviously, such a great service comes at a cost (the *waste-tax*): the price of clearing an interval is the **sum of the unused capacities** for each trash bin in that interval.
More formally, if U_i is the number of bags in the i-th trash bin, the price of emptying an interval $[L, R]$ is: $\sum_{i=L}^{R} C_i - U_i$.
Carlo, after struggling for quite some time with keeping the bins empty, decides to manage his trash more efficiently. Right now, all of his bins are empty. Over the next K days, on day j ($j = 0, 1, \ldots, K-1$), he will produce Q_j bags of a single garbage type T_j, which he will put in the right trash bin. Every evening he will decide whether to call the *neturbìn* to empty a range of his bins.
After those K days, Carlo will go to Milan, and he would like to have **all his trash bins emptied** before leaving home.
He doesn't have a lot of money, so help him find out the minimal amount he will have to spend.

☞ Among the attachments of this task you may find a template file `scoazze.*` with a sample incomplete implementation.

[1] Scrapheap Abolishing Vans Near hOme

Input

The first line contains the integers N and K, the number of trash bins and the number of days. The second line contains N integers C_i, the capacity of the trash bins.
Each of the following K lines contains two integers: T_j, Q_j, the type of trash and the number of bags Carlo will produce on day j, respectively.

Output

You need to write a single integer: the minimum price Carlo has to pay to have all his trash bins emptied after the K days.

Constraints

- $1 \leq N \leq 200\,000$.
- $1 \leq K \leq 200\,000$.
- $1 \leq C_i \leq 10^9$ for each $i = 0 \ldots N-1$.
- $0 \leq T_j \leq N-1$ for each $j = 0 \ldots K-1$.
- $1 \leq Q_j \leq 10^9$ for each $j = 0 \ldots K-1$.
- It is guaranteed that $Q_j \leq C_{T_j}$ for each $j = 0 \ldots K-1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (17 points) $N \leq 4, K \leq 7$.

– **Subtask 3** (25 points) Carlo produces each type of trash at least once.

– **Subtask 4** (20 points) Over the K days, Carlo produces at most C_i bags of trash of type i, for each $i = 0 \ldots N-1$.

– **Subtask 5** (38 points) No additional limitations.

Examples

input	output
2 3 5 7 0 4 1 1 1 7	7

input	output
5 7 66 73 68 79 78 2 50 3 69 0 1 2 20 4 12 1 44 3 11	304

Explanation

In the **first sample case** it is optimal to call the garbage truck after day 1 and clear both of the trash bins (price: $(5-4)+(7-1)=7$). The truck should also be called after the last day to empty the second bin (price: $(7-7)=0$). The total price is 7.

In the **second sample case** we empty the bins with indices 2 and 3 after day 4 (price: $18+10=28$). After the last day we clear all the bins (price: $65+29+48+68+66=276$). The total price is: 304.