5 Fire

There are N districts in JOI Village, numbered from 1 to N. These districts are located in a line. Now, a fire occurs in each district. At time 0, the strength of the fire in the i-th district ($1 \leq i \leq N$) is S_i ($S_i > 0$).

At time 0, the wind blows from the 1st district to the N-th district. For every pair of neighboring districts, if the fire in the upwind district is stronger than the fire in the downwind district at time t ($0 \leq t$), the strength of the fire in the downwind district at time $t+1$ will be the strength of the fire in the upwind district at time t. Otherwise, the strength of the fire in the downwind district at time $t+1$ and time t are the same. Namely, if the strength of the fire in the i-th district ($1 \leq i \leq N$) at time t ($0 \leq t$) is denoted by $S_i(t)$, we have $S_i(t) = \max\{S_{i-1}(t-1), S_i(t-1)\}$ for every t ($1 \leq t$). Here, for any t ($0 \leq t$), we put $S_0(t) = 0$. For any i ($1 \leq i \leq N$), we put $S_i(0) = S_i$.

You are a firefighter. You have Q plans to extinguish the fire. You are planning to do only one of the Q plans. In the j-th plan ($1 \leq j \leq Q$), you will use fire extinguishing agent for the k-th district for every k with $L_j \leq k \leq R_j$, and extinguish the fire in these districts. If the strength of the fire in a district is s, you need s liters of fire extinguishing agent to extinguish the fire in that district. Therefore, the amount of fire extinguishing agent needed for the j-th plan is $S_{L_j}(T_j) + S_{L_j+1}(T_j) + \cdots + S_{R_j}(T_j)$ liters.

In order to examine the plan to be done, you want to know the amount of fire extinguishing agent needed for each plan.

Write a program which, given the strength of the fire at time 0 and information of fire extinguishing plans, calculates the amount of fire extinguishing agent needed for each plan.

Input

Read the following data from the standard input. Given values are all integers.

$N\ Q$
$S_1 \ldots S_N$
$T_1\ L_1\ R_1$
$\vdots$
$T_Q\ L_Q\ R_Q$

Output

Write Q lines to the standard output. In the j-th line ($1 \leq j \leq Q$), output the amount of fire extinguishing agent needed for the j-th plan.

Constraints

- $1 \leq N \leq 200\,000$.
- $1 \leq Q \leq 200\,000$.

- $1 \leq S_i \leq 1\,000\,000\,000$ $(1 \leq i \leq N)$.
- $1 \leq T_j \leq N$ $(1 \leq j \leq Q)$.
- $1 \leq L_j \leq R_j \leq N$ $(1 \leq j \leq Q)$.

Subtasks

1. (1 point) $N \leq 200$, $Q \leq 200$.
2. (6 points) $T_1 = T_2 = \cdots = T_Q$.
3. (7 points) $L_j = R_j$ $(1 \leq j \leq Q)$.
4. (6 points) $S_i \leq 2$ $(1 \leq i \leq N)$.
5. (80 points) No additional constraints.

Sample Input and Output

Sample Input 1	Sample Output 1
5 5 9 3 2 6 5 1 1 3 2 1 5 3 2 5 4 3 3 5 3 5	21 39 33 9 27

- At time 0, the strength of the fire in each district is $9, 3, 2, 6, 5$ from the 1st district.
- At time 1, the strength of the fire in each district is $9, 9, 3, 6, 6$ from the 1st district. The amount of fire extinguishing agent needed for the 1st plan is $9 + 9 + 3 = 21$ liters.
- At time 2, the strength of the fire in each district is $9, 9, 9, 6, 6$ from the 1st district. The amount of fire extinguishing agent needed for the 2nd plan is $9 + 9 + 9 + 6 + 6 = 39$ liters.
- At time 3, the strength of the fire in each district is $9, 9, 9, 9, 6$ from the 1st district. The amount of fire extinguishing agent needed for the 3rd plan is $9 + 9 + 9 + 6 = 33$ liters.
- At time 4, the strength of the fire in each district is $9, 9, 9, 9, 9$ from the 1st district. The amount of fire extinguishing agent needed for the 4th plan is 9 liters.
- At time 5, the strength of the fire in each district is $9, 9, 9, 9, 9$ from the 1st district. The amount of fire extinguishing agent needed for the 5th plan is $9 + 9 + 9 = 27$ liters.

Sample Input 1 satisfies the constraints of Subtask 1 and Subtask 5.

Sample Input 2	Sample Output 2
10 10 3 1 4 1 5 9 2 6 5 3 1 1 6 2 8 10 4 2 7 8 3 3 6 1 10 3 2 8 5 1 9 7 4 5 9 7 9 10 10 10	28 21 34 4 64 43 55 9 27 9

Sample Input 2 satisfies the constraints of Subtask 1 and Subtask 5.

Sample Input 3	Sample Output 3
10 10 3 1 4 1 5 9 2 6 5 3 1 6 6 2 8 8 4 2 2 8 3 3 6 1 1 3 4 4 5 5 5 7 10 10 9 8 8 10 7 7	9 9 3 4 3 4 5 9 9 9

Sample Input 3 satisfies the constraints of Subtask 1, Subtask 3, and Subtask 5.

Sample Input 4	Sample Output 4
10 10 3 1 4 1 5 9 2 6 5 3 7 1 6 7 8 10 7 2 7 7 3 3 7 1 10 7 2 8 7 1 9 7 4 5 7 7 9 7 10 10	28 27 34 4 64 43 55 9 27 9

Sample Input 4 satisfies the constraints of Subtask 1, Subtask 2, and Subtask 5.

Sample Input 5	Sample Output 5
20 20 2 1 2 2 1 1 1 1 2 2 2 1 2 1 1 2 1 2 1 1 1 1 14 2 3 18 4 10 15 8 2 17 9 20 20 4 8 19 7 2 20 11 1 5 13 2 8 20 1 20 2 12 15 7 1 14 12 7 18 14 2 17 9 19 20 12 12 12 6 2 15 11 2 15 19 12 17 4 1 20	25 30 12 32 2 24 38 10 14 40 8 28 24 32 4 2 28 28 12 40

Sample Input 5 satisfies the constraints of Subtask 1, Subtask 4, and Subtask 5.