Жыйналыштар

0дөн $(N-1)$га дейре номурланган N тоо горизонтал түз сызыкта турат. i-инчи тоонун бийиктиги H_i $(0 \leq i \leq N-1)$. Ар бир тоонун чокусунда так бир киши турат.

Сен 0дөн $(Q-1)$га дейре номурланган Q жыйналышты уюштургуң келет. j-инчи жыйналышка $(0 \leq j \leq Q-1)$ L_j-инчи, ..., R_j-инчи тоолордон киши(лер) катышат ($0 \leq L_j \leq R_j \leq N-1$). Бул жыйналыш үчүн, сен x-инчи тоону $(L_j \leq x \leq R_j)$ тандаш керек. Сенин тандооңдон, жыйналыштын баасы төмөнкүдөй эсептелет:

- y-инчи киши катышуучунун баасы $(L_j \leq y \leq R_j)$ x-инчи,..., y-инчи тоо(лор)дун бийиктиктеринин эң чоңуна барабар. (x-инчи катышуучунун баасы анын тоонун бийиктигине барабар).
- Жыйналыштын баасы бардык катышуучуларынын бааларынын суммасына барабар.

Ар бир жыйналыш үчүн, аны уюштуруунун эң аз мүмкүн болгон баасын тапкың келет. Эсиңде болсун: Ар бир жыйналыштан кийин бардык катышуучусу өзүнүн тоосуна кайта келет. Ошондуктан, жыйналыштын баасы башка жыйналыштардын баалары менен байланбайт.

Implementation details

You should implement the following function:

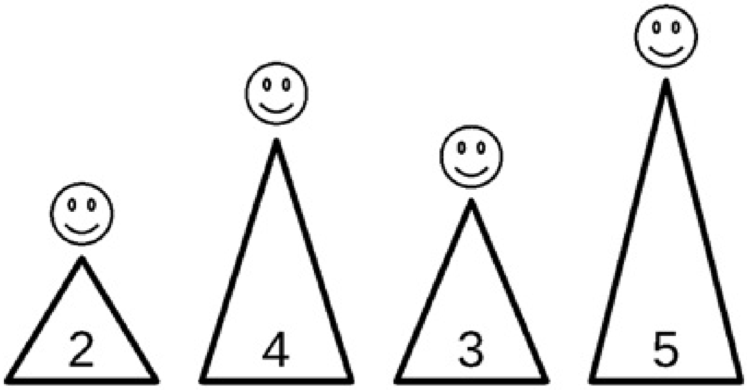
```
int64[] minimum_costs(int[] H, int[] L, int[] R)
```

- `H`: an array of length N, representing the heights of the mountains.
- `L` and `R`: arrays of length Q, representing the range of the participants in the meetings.
- This function should return an array C of length Q. The value of C_j ($0 \leq j \leq Q-1$) must be the minimum possible cost of holding the meeting j.
- Note that the values of N and Q are the lengths of the arrays, and can be obtained as indicated in the implementation notice.

Example

Let $N = 4$, $H = [2, 4, 3, 5]$, $Q = 2$, $L = [0, 1]$, and $R = [2, 3]$.

The grader calls `minimum_costs([2, 4, 3, 5], [0, 1], [2, 3])`.



The meeting $j = 0$ has $L_j = 0$ and $R_j = 2$, so will be attended by the people living on the mountains 0, 1, and 2. If the mountain 0 is chosen as the meeting place, the cost of the meeting 0 is calculated as follows:

- The cost of the participant from the mountain 0 is $\max\{H_0\} = 2$.
- The cost of the participant from the mountain 1 is $\max\{H_0, H_1\} = 4$.
- The cost of the participant from the mountain 2 is $\max\{H_0, H_1, H_2\} = 4$.
- Therefore, the cost of the meeting 0 is $2 + 4 + 4 = 10$.

It is impossible to hold the meeting 0 at a lower cost, so the minimum cost of the meeting 0 is 10.

The meeting $j = 1$ has $L_j = 1$ and $R_j = 3$, so will be attended by the people living on the mountains 1, 2, and 3. If the mountain 2 is chosen as the meeting place, the cost of the meeting 1 is calculated as follows:

- The cost of the participant from the mountain 1 is $\max\{H_1, H_2\} = 4$.
- The cost of the participant from the mountain 2 is $\max\{H_2\} = 3$.
- The cost of the participant from the mountain 3 is $\max\{H_2, H_3\} = 5$.
- Therefore, the cost of the meeting 1 is $4 + 3 + 5 = 12$.

It is impossible to hold the meeting 1 at a lower cost, so the minimum cost of the meeting 1 is 12.

The files `sample-01-in.txt` and `sample-01-out.txt` in the zipped attachment package correspond to this example. Other sample inputs/outputs are also available in the package.

Constraints

- $1 \leq N \leq 750\,000$
- $1 \leq Q \leq 750\,000$
- $1 \leq H_i \leq 1\,000\,000\,000$ $(0 \leq i \leq N - 1)$

- $0 \leq L_j \leq R_j \leq N-1$ $(0 \leq j \leq Q-1)$
- $(L_j, R_j) \neq (L_k, R_k)$ $(0 \leq j < k \leq Q-1)$

Subtasks

1. (4 points) $N \leq 3\,000$, $Q \leq 10$
2. (15 points) $N \leq 5\,000$, $Q \leq 5\,000$
3. (17 points) $N \leq 100\,000$, $Q \leq 100\,000$, $H_i \leq 2$ $(0 \leq i \leq N-1)$
4. (24 points) $N \leq 100\,000$, $Q \leq 100\,000$, $H_i \leq 20$ $(0 \leq i \leq N-1)$
5. (40 points) No additional constraints

Sample grader

The sample grader reads the input in the following format:

- line 1: N Q
- line 2: H_0 H_1 $\cdots$ H_{N-1}
- line $3+j$ $(0 \leq j \leq Q-1)$: L_j R_j

The sample grader prints the return value of `minimum_costs` in the following format:

- line $1+j$ $(0 \leq j \leq Q-1)$: C_j