Register report

You have N registers $a_0, a_1, \ldots, a_{N-1}$, each of which can hold a nonnegative integer. The following operations are defined on these registers:

- 1 i : Increment a_i by 1.
- 2 x : Find the number of indices j such that $a_j \geq x$.
- 3 y : For all j such that $a_j \geq y$, decrement a_j by 1.

You are given the initial values of the registers, and a sequence of operations of these three types to perform. You have to update the values of the registers appropriately for each operation of the type 1 i and 3 y and report the result of each operation of the type 2 x.

Input format

- Line 1 of the input has two space-separated integers, N and Q, where N is the number of registers and Q is the number of operations to be performed.
- Line 2 of the input has N space-separated integers, the initial values of $a_0, \ldots, a_{N-1}$.
- Lines 3 to Q+2 each consist of two space-separated integers. Each of these Q lines represents an operation, as described above. The first integer in each of these lines is always 1, 2, or 3. The operations are to be executed in the same order as presented in the input.

Output format

For each instruction of the type 2 x, output a line with a single integer, the number of indices j such that $a_j \geq x$.

Test data

In all subtasks, $1 \leq N \leq 10^5$ and $0 \leq Q \leq 5 \times 10^5$. The initial value of each register is between 0 and 10^8, inclusive. For each operation of the type 2 x, $0 \leq x \leq 10^9$. For each operation of the type 3 y, $1 \leq y \leq 10^9$.

- Subtask 1 (10 marks) : $N \leq 1000$ and $Q \leq 5000$.
- Subtask 2 (30 marks) : All registers have initial value 0.
  There are no operations of the type 3 y.
- Subtask 3 (60 marks) : No additional constraints.

Sample input

```
5 6
20 30 10 50 40
2 31
1 1
2 31
3 11
2 20
2 50
```

Sample output

```
2
3
3
0
```

Limits

- *Memory limit* : 128 MB
- *Time limit* : 4s