Task C. Decrease Priority (1 point)

The maximum heap is given and requests are executed on it.

The query is given by two integers i and x. It is required to reduce the value of the i-th element of the heap by x and perform $SiftDown$ to restore the heap.

Input format

The first line contains the heap size N ($1 \leq N \leq 10^5$).

The second line introduces the heap itself – N different integers, each of which modulo does not exceed 10^9. It is guaranteed that these numbers make up the correct maximum heap.

The third line introduces the number M ($1 \leq M \leq 10^5$ – the number of requests.

The following M lines introduce the queries themselves, one per line.

It is guaranteed that $1 \leq i \leq N$, $x \geq 0$, the new value of the heap element modulo does not exceed 10^9 and differs from the current values of all other elements of the heap.

Output format

As a response to the request, it is required to display one number on a separate line – the number of the heap element in which the changed element turned out after $SiftDown$.

In addition, after all the requests have been completed, it is necessary to display the heap in its final state.

Sample input:

```
6
12 6 8 3 4 7
2
2 5
1 2
```

Sample output:

```
5
1
10 4 8 3 1 7
```