C. First element at least X

time limit per test: 1 second
memory limit per test: 1024 megabytes
input: standard input
output: standard output

In this task, you need to add to the segment tree the operation of finding the minimum index j such that $a[j] \geq x$.

Input

The first line contains two integers n and m ($1 \leq n, m \leq 100000$), the size of the array and the number of operations. The next line contains n numbers a_i, the initial state of the array ($0 \leq a_i \leq 10^9$). The following lines contain the description of the operations. The description of each operation is as follows:

- 1 i v: change the item with index i to v ($0 \leq i < n, 0 \leq v \leq 10^9$).
- 2 x: find the minimum index j such that $a[j] \geq x$. If there is no such element, print -1. Indices start from 0.

Output

For each operation of the second type, print the answer for the query.

Example

input Copy

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

output Copy

```
1
4
2
-1
3
```