Missing Number Queries

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Busy Beaver has an array of positive integers $a_1, \ldots, a_N$, consisting of positive integers at most N. He needs to perform Q operations on the array of two types:

- `1` x y: Set $a_x \leftarrow y$.
- `2` l r: Output **any** integer in the range $[1, N]$ that is *not* found in $a_l, a_{l+1}, \ldots, a_r$.

Help answer all of Busy Beaver's queries! The input will be generated in such a way that an answer exists for all type `2` queries.

Input

The first line contains two positive integers N and Q ($2 \leq N \leq 2 \cdot 10^5$; $1 \leq Q \leq 2 \cdot 10^5$).

The second line contains N integers $a_1, \ldots, a_N$ ($1 \leq a_i \leq N$).

Each of the next Q lines contains three positive integers: either `1` x y or `2` l r ($1 \leq x, y \leq N$; $1 \leq l \leq r \leq N$).

Additional constraint on the input: there is at least one type `2` query, and every type `2` query has an answer.

Output

For each type `2` query, output a single line containing the answer. If there are multiple possible answers for a query, you may output any of them.

Scoring

There are three subtasks for this problem.

- (20 points) $N, Q \leq 2000$.
- (30 points) All queries are of type `2`.
- (50 points) No additional constraints.

Example

standard input	standard output
5 4 3 5 2 1 5 2 1 5 1 4 4 1 3 1 2 3 5	4 2

Note

In the first query, the only integer from 1 to 5 missing from $[3, 5, 2, 1, 5]$ is 4, so 4 is the only possible answer.

After the second query, the array becomes $[3, 5, 2, 4, 5]$.

After the third query, the array becomes $[3, 5, 1, 4, 5]$.

The last query asks for an integer from 1 to 5 missing from $[1, 4, 5]$. Either 2 or 3 would be acceptable answers to this query.