Problem E
Range Maximum Queries

Time limit: 2 seconds
Memory limit: 2048 megabytes

Problem Description

Given an array of n integers $a_1, a_2, \ldots, a_n$ and q queries to be performed on these integers. Each query belongs to one of the following two types:

1. 1 idx_i v_i —Change a_{idx_i} to v_i. That is, $a_{idx_i} := v_i$.

2. 2 l_i r_i —Find the maximum of the numbers $a_{l_i}, a_{l_i+1}, \ldots, a_{r_i}$. In other words, sort the numbers $a_{l_i}, a_{l_i+1}, \ldots, a_{r_i}$ in ascending order and output the last element.

Can you answer all these queries?

Input Format

The first line of the input contains two integers n and q. The second line of the input contains n space-separated integers $a_1, a_2, \ldots, a_n$. The i-th of the following q lines contains the i-th query in the format as in the problem description.

Output Format

For each query of type 2, output the maximum value in one line.

Technical Specification

- $1 \leq n, q \leq 3 \times 10^5$
- $1 \leq a_i \leq 10^9$ for $i = 1, 2, \ldots, n$
- $1 \leq idx_i \leq n$ for $i = 1, 2, \ldots, q$ of query type 1
- $1 \leq v_i \leq 10^9$ for $i = 1, 2, \ldots, q$ of query type 1
- $1 \leq l_i \leq r_i \leq n$ for $i = 1, 2, \ldots, q$ of query type 2
- It is guaranteed that there is at least one query of type 2 in the input.

Scoring

1. (2 points) $1 \leq n, q \leq 1000$
2. (9 points) There is no query of type 1 in the input.
3. (4 points) No additional constraints.

Sample Input 1

```
5 5
3 2 1 5 4
2 2 4
1 1 6
1 3 5
2 1 3
2 2 4
```

Sample Output 1

```
5
6
5
```

Sample Input 2

```
6 7
3 6 10 3 5 8
2 1 6
2 4 5
1 3 1
2 1 5
1 5 7
2 3 5
2 2 3
```

Sample Output 2

```
10
5
6
7
6
```