Competitive Programming and Contests

Min and max

You are given an array $A[1, n]$ of n positive integers, each integer is at most n. You have to build a data structure to answer two different types of queries:

- $\mathsf{Update}(i, j, T)$ that replaces every value $A[k]$ with $\min(A[k], T)$, where $i \leq k \leq j$;
- $\mathsf{Max}(i, j)$ that returns the largest value in $A[i \ldots j]$.

Our target solution runs in $O((n+m) \log n)$ time, where m is the number of queries.

Input. The first line contains n and m. The next line contains the n integers in A. Each of the subsequent m lines contains the query. The first value of each line is either 0 (query Update) or 1 (query Max). For a query Update the values of i, j, and T follows. For a query Max the values of i and j follows.

Output. Results of Max queries.

Example

Input	Output

```
5 3       // n m                          4
5 1 4 3 2 // A                            2
0 1 2 2   // Update(1, 2, 2). A becomes 2 1 4 3 2
1 2 4     // Max(2, 4) = 4
1 1 2     // Max(1, 2) = 2
```