

Problem G. Gleb Evstropov

Input file: *standard input*
Output file: *standard output*
Time limit: 20 seconds
Memory limit: 512 mebibytes

You are given an array a .

Process two types of queries:

1. You are given x and y . Set a_x to y .
2. You are given l, r and k . Find the largest value of m , such that sequence $k, k + 1, \dots, m$ is a subsequence of $a_{l:r}$.

Input

The first line contains two integers n and q ($1 \leq n, q \leq 10^6$), the length of a and the number of queries, respectively.

The second line contains n integers a_i ($0 \leq a_i < n$), the elements of a .

q lines follow. Each of them has one of the following forms:

- $1 \ x \ y$ ($0 \leq x, y < n$), describing a query of the first type.
- $2 \ l \ r \ k$ ($0 \leq l < r \leq n, 0 \leq k < n$), describing a query of the second type. Note that half-intervals are used, i.e. $a_{0:3}$ contains elements with indices 0, 1 and 2. It is guaranteed that the given half-interval contains at least one element equal to k .

Output

For each query of the second type print the corresponding m .

Example

standard input	standard output
6 17	1
0 0 0 1 2 1	2
2 0 4 0	0
2 0 5 0	1
1 3 2	2
2 0 4 0	1
2 0 6 0	1
2 0 4 2	2
2 5 6 1	5
1 0 1	
2 1 6 1	
2 0 5 1	
1 0 0	
1 5 5	
1 2 2	
1 4 4	
1 3 3	
1 1 1	
2 0 6 0	