

## F. Machine Learning

time limit per test: 4 seconds  
memory limit per test: 512 megabytes  
input: standard input  
output: standard output

*You come home and fell some unpleasant smell. Where is it coming from?*

You are given an array  $a$ . You have to answer the following queries:

1. You are given two integers  $l$  and  $r$ . Let  $c_i$  be the number of occurrences of  $i$  in  $a_{l:r}$ , where  $a_{l:r}$  is the subarray of  $a$  from  $l$ -th element to  $r$ -th inclusive. Find the **Mex** of  $\{c_0, c_1, \dots, c_{10^9}\}$
2. You are given two integers  $p$  to  $x$ . Change  $a_p$  to  $x$ .

The **Mex** of a multiset of numbers is the smallest non-negative integer **not in** the set.

Note that in this problem all elements of  $a$  are positive, which means that  $c_0 = 0$  and 0 is never the answer for the query of the second type.

### Input

The first line of input contains two integers  $n$  and  $q$  ( $1 \leq n, q \leq 100\,000$ ) — the length of the array and the number of queries respectively.

The second line of input contains  $n$  integers —  $a_1, a_2, \dots, a_n$  ( $1 \leq a_i \leq 10^9$ ).

Each of the next  $q$  lines describes a single query.

The first type of query is described by three integers  $t_i = 1, l_i, r_i$ , where  $1 \leq l_i \leq r_i \leq n$  — the bounds of the subarray.

The second type of query is described by three integers  $t_i = 2, p_i, x_i$ , where  $1 \leq p_i \leq n$  is the index of the element, which must be changed and  $1 \leq x_i \leq 10^9$  is the new value.

### Output

For each query of the first type output a single integer — the **Mex** of  $\{c_0, c_1, \dots, c_{10^9}\}$ .

### Example

input
10 4 1 2 3 1 1 2 2 2 9 9 1 1 1 1 2 8 2 7 1 1 2 8
output
2 3 2

### Note

The subarray of the first query consists of the single element — 1.

The subarray of the second query consists of four 2s, one 3 and two 1s.

The subarray of the fourth query consists of three 1s, three 2s and one 3.