

# B1. Shave Beaver!

time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

The Smart Beaver has recently designed and built an innovative nanotechnologic all-purpose beaver mass shaving machine, "Beavershave 5000". Beavershave 5000 can shave beavers by families! How does it work? Very easily!

There are  $n$  beavers, each of them has a unique id from 1 to  $n$ . Consider a permutation  $a_1, a_2, \dots, a_n$  of  $n$  these beavers. Beavershave 5000 needs one session to shave beavers with ids from  $x$  to  $y$  (inclusive) if and only if there are such indices  $i_1 < i_2 < \dots < i_k$ , that  $a_{i_1} = x$ ,  $a_{i_2} = x + 1$ , ...,  $a_{i_{k-1}} = y - 1$ ,  $a_{i_k} = y$ . And that is really convenient. For example, it needs one session to shave a permutation of beavers  $1, 2, 3, \dots, n$ .

If we can't shave beavers from  $x$  to  $y$  in one session, then we can split these beavers into groups  $[x, p_1]$ ,  $[p_1 + 1, p_2]$ , ...,  $[p_m + 1, y]$  ( $x \leq p_1 < p_2 < \dots < p_m < y$ ), in such a way that the machine can shave beavers in each group in one session. But then Beavershave 5000 needs  $m + 1$  working sessions to shave beavers from  $x$  to  $y$ .

All beavers are restless and they keep trying to swap. So if we consider the problem more formally, we can consider queries of two types:

- what is the minimum number of sessions that Beavershave 5000 needs to shave beavers with ids from  $x$  to  $y$ , inclusive?
- two beavers on positions  $x$  and  $y$  (the beavers  $a_x$  and  $a_y$ ) swapped.

You can assume that any beaver can be shaved any number of times.

## Input

The first line contains integer  $n$  — the total number of beavers,  $2 \leq n$ . The second line contains  $n$  space-separated integers — the initial beaver permutation.

The third line contains integer  $q$  — the number of queries,  $1 \leq q \leq 10^5$ . The next  $q$  lines contain the queries. Each query  $i$  looks as  $p_i x_i y_i$ , where  $p_i$  is the query type (1 is to shave beavers from  $x_i$  to  $y_i$ , inclusive, 2 is to swap beavers on positions  $x_i$  and  $y_i$ ). All queries meet the condition:  $1 \leq x_i < y_i \leq n$ .

- to get 30 points, you need to solve the problem with constraints:  $n \leq 100$  (subproblem B1);
- to get 100 points, you need to solve the problem with constraints:  $n \leq 3 \cdot 10^5$  (subproblems B1+B2).

Note that the number of queries  $q$  is limited  $1 \leq q \leq 10^5$  in both subproblem B1 and subproblem B2.

## Output

For each query with  $p_i = 1$ , print the minimum number of Beavershave 5000 sessions.

## Examples

input
5 1 3 4 2 5 6 1 1 5 1 3 4 2 2 3 1 1 5 2 1 5 1 1 5
output

2  
1  
3  
5