G. Mass Change Queries

time limit per test: 3 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

You are given an array a consisting of n integers. You have to process q queries to this array; each query is given as four numbers l, r, x and y, denoting that for every i such that $l \leq i \leq r$ and $a_i = x$ you have to set a_i equal to y.

Print the array after all queries are processed.

Input

The first line contains one integer n ($1 \leq n \leq 200000$) — the size of array a.

The second line contains n integers $a_1, a_2, ..., a_n$ ($1 \leq a_i \leq 100$) — the elements of array a.

The third line contains one integer q ($1 \leq q \leq 200000$) — the number of queries you have to process.

Then q lines follow. i-th line contains four integers l, r, x and y denoting i-th query ($1 \leq l \leq r \leq n$, $1 \leq x, y \leq 100$).

Output

Print n integers — elements of array a after all changes are made.

Example

input

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

output

```
5 2 5 4 5
```