

Write a program to transform an array  $A[1], A[2], \dots, A[n]$  according to  $m$  instructions. Each instruction  $(L, R, v, p)$  means: First, calculate how many numbers from  $A[L]$  to  $A[R]$  (inclusive) are strictly less than  $v$ , call this answer  $k$ . Then, change the value of  $A[p]$  to  $u * k / (R - L + 1)$ , here we use integer division (i.e. ignoring fractional part).

## Input

The first line of input contains three integer  $n, m, u$  ( $1 \leq n \leq 300,000, 1 \leq m \leq 50,000, 1 \leq u \leq 1,000,000,000$ ). Each of the next  $n$  lines contains an integer  $A[i]$  ( $1 \leq A[i] \leq u$ ). Each of the next  $m$  lines contains an instruction consisting of four integers  $L, R, v, p$  ( $1 \leq L \leq R \leq n, 1 \leq v \leq u, 1 \leq p \leq n$ ).

## Output

Print  $n$  lines, one for each integer, the final array.

## Sample Input

```
10 1 11
1
2
3
4
5
6
7
8
9
10
2 8 6 10
```

## Sample Output

```
1
2
3
4
5
6
7
8
9
6
```

**Explanation:** There is only one instruction:  $L = 2, R = 8, v = 6, p = 10$ . There are 4 numbers (2,3,4,5) less than 6, so  $k = 4$ . The new number in  $A[10]$  is  $11 * 4 / (8 - 2 + 1) = 44 / 7 = 6$ .