

12003 Array Transformer

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 $11 * 4 / (8 - 2 + 1) = 44 / 7 = 6$.