

## Problem B. Bruteforce

Input file: *standard input*  
Output file: *standard output*  
Time limit: 5 seconds  
Memory limit: 512 mebibytes

You are given fixed integers  $k$  and  $w$ .

For an array  $a$  of length  $n$ , let us define its *weight* in the following way:

- Let  $b$  be the array  $a$  sorted in non-descending order.
- The weight of  $a$  is then defined as  $\sum_{i=1}^n \left\lfloor \frac{b_i \cdot i^k}{w} \right\rfloor$ .

Here,  $\lfloor x \rfloor$  is the largest integer not exceeding  $x$ .

For example, if  $k = 3$  and  $w = 3$ , then the weight of  $a = [3, 2, 2]$  is equal to:

$$\left\lfloor \frac{2 \cdot 1^2}{3} \right\rfloor + \left\lfloor \frac{2 \cdot 2^2}{3} \right\rfloor + \left\lfloor \frac{3 \cdot 3^2}{3} \right\rfloor = 0 + 2 + 9 = 11.$$

You are given an initial array  $a$ , and will be given  $q$  queries. Each query changes one element of array  $a$ . After each query, you should output the new weight of the array. Since array weights can be really large, you should output them modulo 998 244 353.

Note that the changes persist between queries. For example, the second query is applied to the array which is already changed by the first query.

### Input

The first line contains three integers  $n, k, w$  ( $1 \leq n \leq 10^5$ ,  $1 \leq k \leq 5$ ,  $1 \leq w \leq 5$ ): the length of the array and the parameters from the statement.

The second line contains  $n$  integers  $a_i$  ( $0 \leq a_i \leq 10^5$ ): the elements of the original array.

The third line contains a single integer  $q$  ( $1 \leq q \leq 10^5$ ): the number of queries.

Each of the next  $q$  lines contains two integers,  $pos$  and  $x$  ( $1 \leq pos \leq n$ ,  $0 \leq x \leq 10^5$ ). This describes a query that changes  $a_{pos}$  into  $x$ .

### Output

Output  $q$  integers: the weights of the array after each change, modulo 998 244 353.

### Examples

standard input	standard output
3 1 1 2 2 8 2 2 5 3 6	36 30
4 2 2 1 3 3 7 4 1 1 2 4 3 8 4 8	75 80 103 108