

# Update again?

You are given array **A** with **N** integers and two constant integers **x** and **y**. Here how we define the cost **C** of an array **A**.

Let **B** be the sorted version of array **A**, then 
$$C = \sum_{i=1}^n \lfloor \frac{B_i \cdot i^x}{y} \rfloor.$$

You will be given **Q** queries to be applied on the given initial array **A**. Each query changes one element of the array **A** and after each update, you are asked to compute the new cost of the array. Since array costs can be really large, you should print the answers in modulo **998 244 353**.

Note that, here  $\lfloor x \rfloor$  stands for the largest integer not exceeding **x**.

The updates on array persist between queries. For instance, the **2<sup>nd</sup>** query is applied to the array which is already changed by the **1<sup>st</sup>** query.

## Input Format

The first line contains three integers **N**, **x**, and **y**: the length of the array **A** and the parameters for computing the cost of an array.

The second line contains **N** integers **A<sub>1</sub>**, **A<sub>2</sub>**, ..., **A<sub>N</sub>**: the elements of initial array.

The third line contains a single integer **Q**: the number of queries.

Each of the next **Q** lines contains two integers, **pos**, and **val**. Describes a query that changes **A<sub>pos</sub>** to **val**.

## Constraints

$$1 \leq N, Q \leq 10^5$$

$$1 \leq x, y \leq 5$$

$$1 \leq pos \leq N$$

$$0 \leq A_i, val \leq 10^5$$

## Output Format

Output **Q** integers: the costs of the array after each change in modulo **998 244 353**.

## Sample Input:

```
3 1 1
2 2 8
2
2 5
3 6
```

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## Sample Output:

Submit Solution

✓ **Points:** 1

⌚ **Time limit:** 5.0s

Java 8: 10.0s

Python: 12.0s

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36

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**Note:**

It can be hard to see the math formula in the second paragraph. This image shows that formula clearly.

$$C = \sum_{i=1}^n \left\lfloor \frac{B_i \cdot i^x}{y} \right\rfloor$$

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