Problem A2
Increasing Matrix (Hard Version)

Time limit: 2 seconds
Memory limit: 2048 megabytes

Problem Description

Given two **increasing** arrays, $a_1, a_2, \ldots, a_n$ and $b_1, b_2, \ldots, b_m$, we create an "increasing matrix" A with dimensions $n \times m$, where the j-th element of the i-th row can be determined as $A_{i,j} = a_i^2 + a_i b_j + b_j^2$. The term "increasing matrix" is used because the elements in each row are arranged in ascending order.

Your task is to find the k smallest elements in the matrix A. To avoid large amount of output, you have to output the bitwise XOR of the k smallest elements.

Input Format

The first line of the input contains three integers n, m and k. The second line of the input contains n space-separated integers $a_1, a_2, \ldots, a_n$. The third line of the input contains m space-separated integers $b_1, b_2, \ldots, b_m$.

Output Format

Output the bitwise XOR of the k smallest elements in one line.

Technical Specification

- $1 \leq n, m \leq 10^5$
- $1 \leq k \leq 10^6$
- $1 \leq a_i \leq 10^9$ for $i = 1, 2, \ldots, n$
- $1 \leq b_i \leq 10^9$ for $i = 1, 2, \ldots, m$

Sample Input 1

```
2 3 6
1 2
3 4 5
```

Sample Output 1

```
47
```

Sample Input 2

```
10 10 15
3 4 5 6 7 9 10 19 19 29880
1 8 12 20 30 49 64 87 94 100000
```

Sample Output 2

```
56
```

Sample Input 3

```
2 2 3
1000000000 1000000000
1000000000 1000000000
```

Sample Output 3

```
3000000000000000000
```

Hint

One problem from the handwritten assignments may help in this problem.