



## Problem E. Fast Median Transform

The *median* in an array of length  $k$  is the element that occupies the position  $\lfloor \frac{k+1}{2} \rfloor$  after we sort the elements in non-decreasing order. For example, the median of  $[5, 1, 2, 3]$  is 2, and the median of  $[2, 1, 1]$  is 1.

Little Cyan Fish gives you an array  $a$  of length  $n$ , and an array  $b$  of length  $m$ . Here, the index of an array starts from 0.

For an integer  $X_0$ , we define the “Fast Median Transform” of  $(a, b, X_0)$  (called  $\text{FMT}(a, b, X_0)$ ):

- Let  $X$  be a variable, initially  $X = X_0$ .
- For each integer  $i$  from 0 to  $nm - 1$ , the following operations happen in order:
  - Calculate the median of the array  $[a_{i \bmod n}, b_{i \bmod m}, X]$ . Let the median be  $Y$ .
  - Assign  $Y$  to  $X$ .
- We define  $\text{FMT}(a, b, X_0)$  as **the value of  $X$  at the end of the process**.

You will be given  $q$  queries. Each query consists of three integers  $x, y', X'_0$ . For each query, perform the following operations:

1. Update  $a_x$  to  $y' \oplus \text{lastans}$ , where  $\oplus$  denotes the bitwise XOR operation and  $\text{lastans}$  is the result of the previous query (initially zero).
2. Compute and print  $\text{FMT}(a, b, X'_0 \oplus \text{lastans})$ .

Note: The queries are not independent; they occur in order, and the effect of each query persists.

### Input

The first line of the input contains three integers  $n, m, q$  ( $1 \leq n, m, q \leq 3 \times 10^5$ ), indicating the length of  $a$ , the length of  $b$ , and the number of queries, respectively.

The second line contains  $n$  non-negative integers  $a_0, a_1, \dots, a_{n-1}$  ( $0 \leq a_i < 2^{29}$ ).

The third line contains  $m$  non-negative integers  $b_0, b_1, \dots, b_{m-1}$  ( $0 \leq b_i < 2^{29}$ ).

Then  $q$  lines follow.

The  $i$ -th line contains three non-negative integers  $x, y',$  and  $X'_0$  ( $0 \leq x < n, 0 \leq y', X'_0 < 2^{29}$ ), indicating the  $i$ -th query.

### Output

Output  $q$  lines. The  $i$ -th line contains a single integer indicating the answer  $\text{FMT}(a, b, X'_0 \oplus \text{lastans})$  of the  $i$ -th query.

### Example

standard input	standard output
2 3 1 1 3 4 2 3 0 1 2	3