Bubble Cup V8 A Fibonotci

Time limit: 1.4s **Memory limit:** 64M

Fibonotci sequence is an integer recursive sequence defined by the recurrence relation

$$F_n = c_{n-1} \cdot F_{n-1} + c_{n-2} \cdot F_{n-2}$$

with

$$F_0 = 0, F_1 = 1.$$

Sequence c is infinite and *almost cyclic* sequence with a cycle of length N. A sequence s is *almost cyclic* with a cycle of length N iff $s_i = s_{i \bmod N}$, for $i \geq N$, except for a finite number of values s_i, for which $s_i \neq s_{i \bmod N}$ $(i \geq N)$.

Following is an example of an almost cyclic sequence with a cycle of length 4.

$$s = (5, 3, 8, 11, 5, 3, 7, 11, 5, 3, 8, 11, \ldots)$$

Notice that the only value of s for which the equality $s_i = s_{i \bmod 4}$ does not hold is s_6 ($s_6 = 7$ and $s_2 = 8$).

You are given $c_0, c_1, \ldots, c_{N-1}$ and all the values of sequence c for which $c_i \neq c_{i \bmod N}$ $(i \geq N)$.

Find $F_K \bmod P$.

Input Specification

The first line contains two numbers K and P. The second line contains a single number N. The third line contains N numbers separated by spaces, that represent the first N numbers of the sequence c. The fourth line contains a single number M, the number of values of sequence c for which $c_i \neq c_{i \bmod N}$. Each of the following M lines contains two integers j and v, indicating that $c_j \neq c_{j \bmod N}$ and $c_j = v$.

Output Specification

Output should contain a single integer equal to $F_K \bmod P$.

Constraints

- $1 \leq N, M \leq 50\,000$
- $0 \leq K \leq 10^{18}$
- $1 \leq P \leq 10^9$
- $1 \leq c_i \leq 10^9$, for $i = 0, 1, \ldots, N-1$
- $N \leq j \leq 10^{18}$
- $1 \leq v \leq 10^9$
- All values are integers

Sample Input

```
10 8
3
1 2 1
2
7 3
5 4
```

Sample Output

```
4
```