Matching Query

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	1024 megabytes

You are given an integer sequence $A = (A_1, A_2, \ldots, A_N)$ of length N, where each element is an integer between 0 and $M - 1$ (inclusive).

You need to process Q queries in order. The i-th query is described as follows:

- Given integers x_i and y_i, update the x_i-th element of A to y_i. After the update, solve the following problem:
  - Construct an undirected graph G with N vertices based on the sequence A. The vertices are numbered from 1 to N, and there is an edge between vertices u and v ($1 \leq u < v \leq N$, note the order of u and v) if and only if $A_u + 1 \equiv A_v \pmod{M}$. Find the size of a maximum matching of G.

Input

The input is given from Standard Input in the following format:

N M Q
A_1 A_2 $\ldots$ A_N
x_1 y_1
x_2 y_2
$\vdots$
x_Q y_Q

- $2 \leq N \leq 3 \times 10^5$
- $1 \leq Q \leq 3 \times 10^5$
- $2 \leq M \leq 3 \times 10^5$
- $0 \leq A_i < M$
- $1 \leq x_i \leq N$
- $0 \leq y_i < M$
- All input values are integers.

Output

Print Q lines. The i-th line should contain the answer to the i-th query.

Example

standard input	standard output
6 3 5 1 1 0 2 0 2 6 0 4 1 5 2 1 2 6 2	1 1 2 3 3

Note

For the first query, A_6 is updated to 0, resulting in $A = (1, 1, 0, 2, 0, 0)$. The graph G has edges between the vertex pairs $(1, 4), (2, 4), (4, 5)$ and $(4, 6)$. The size of a maximum matching of G is 1.

For the second query, A_4 is updated to 1, resulting in $A = (1, 1, 0, 1, 0, 0)$. The graph G has an edge between the vertex pair $(3, 4)$. The size of a maximum matching of G is 1.