E. XOR and Favorite Number

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Bob has a favorite number k and a_i of length n. Now he asks you to answer m queries. Each query is given by a pair l_i and r_i and asks you to count the number of pairs of integers i and j, such that $l \le i \le j \le r$ and the xor of the numbers $a_i, a_{i+1}, ..., a_j$ is equal to k.

Input

The first line of the input contains integers n, m and k ($1 \le n, m \le 100\,000$, $0 \le k \le 1\,000\,000$) — the length of the array, the number of queries and Bob's favorite number respectively.

The second line contains n integers a_i ($0 \le a_i \le 1\,000\,000$) — Bob's array.

Then m lines follow. The i-th line contains integers l_i and r_i ($1 \le l_i \le r_i \le n$) — the parameters of the i-th query.

Output

Print m lines, answer the queries in the order they appear in the input.

Examples

input
6 2 3 1 2 1 1 0 3 1 6 3 5

output
7 0

input
5 3 1 1 1 1 1 1 1 5 2 4 1 3

output
9 4 4

Note

In the first sample the suitable pairs of i and j for the first query are: $(1, 2)$, $(1, 4)$, $(1, 5)$, $(2, 3)$, $(3, 6)$, $(5, 6)$, $(6, 6)$. Not a single of these pairs is suitable for the second query.

In the second sample xor equals 1 for all subarrays of an odd length.