

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 $l \leq i \leq j \leq r$ and the xor of the numbers a_i, a_{i+1}, \dots, a_j is equal to k .

Input

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

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

Then m lines follow. The i -th line contains integers l_i and r_i ($1 \leq l_i \leq r_i \leq n$) — 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.

Codeforces Round #340 (Div. 2)

Finished

Practice



→ Virtual participation

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→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Submit?

 Language: GNU G++ 5.1.0

 Choose file: [Choose File](#) No file chosen

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

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