Problem J. XOR Queries

Time limit	3000 ms
Code length Limit	50000 B
OS	Linux

You are given an array: $a_1, a_2, \cdots, a_n$ və q queries. Each query belongs to one of the following two types

- $1\ i\ v$: Assign $a_i := v$;
- $2\ j\ k$: Count how many i such that $i \leq j$ and $a_1 \oplus a_2 \oplus \cdots \oplus a_i = k$.

(Note: here $\oplus$ denotes the XOR operation.)
(Note: here $:=$ means assignment.)

Input

The first line contains two integers: n and q ($1 \leq n, q \leq 10^5$).

The second line contains n integers: $a_1, a_2, \cdots, a_n$ ($a_i \leq 10^6$ and $1 \leq i \leq n$)

The next q lines each describe a query using three integers: either $1\ i\ v$ or $2\ j\ k$ ($1 \leq i, j \leq n$, $1 \leq v, k \leq 10^6$).

Output

For each query of type 2, print one integer — the answer to that query.

Subtasks

Subtask #1 (100 **points):** $1 \leq N, Q \leq 1,000$

Subtask #2 (150 **points):** $1 \leq N, Q \leq 10,000$

Subtask #3 (250 **points):** original constraints

Example

Input	Output
5 3 1 1 1 1 1 2 5 1 1 3 2 2 5 1	3 1