

Distributive Property

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 256 megabytes

You are given a set S of n distinct integers. You will also receive q queries, each of one of the following two types:

1. **Query Type 1** ($1\ x$):

- If x is currently in the set S , remove it.
- Otherwise, add x to the set.

2. **Query Type 2** ($2\ t$):

- Print the cumulative bitwise XOR of $(x + t)$ over all $x \in S$. Formally, print $\bigoplus_{x \in S} (x + t)$.

Input

The first line of the input contains two integers n and q ($1 \leq n, q \leq 3 \cdot 10^5$) — the initial size of the set and the number of queries, respectively.

The next line of the input will contain n distinct integers $x_1, x_2 \dots x_n$ ($0 \leq x_i < 2^{20}$) — the initial set.

The next q lines of the input will describe the queries. Each of them will contain a query of the form $1\ x$ or $2\ t$ ($0 \leq x, t < 2^{20}$), representing the query in the format described above.

It is guaranteed that there is at least one query of type 2.

Output

For each query of type 2, print the cumulative bitwise XOR of $(x + t)$ over all $x \in S$.

Example

standard input	standard output
3 10	8
1 6 15	19
2 0	17
1 5	21
1 6	18
1 10	
2 3	
2 12	
1 15	
2 7	
1 0	
2 7	

Note

In the sample case, at the time of the first type 2 query, we have $S = \{1, 6, 15\}$. Since $t = 0$ for this query, we print the value

$$(1 + 0) \oplus (6 + 0) \oplus (15 + 0) = 1 \oplus 6 \oplus 15 = 8$$

At the time of the second type 2 query, we have $S = \{1, 5, 10, 15\}$. Since $t = 3$ for this query, we print the value

$$(1 + 3) \oplus (5 + 3) \oplus (10 + 3) \oplus (15 + 3) = 4 \oplus 8 \oplus 13 \oplus 18 = 19$$