A Fenwick Tree Question

Time limit: 0.6s   **Memory limit:** 64M

Simple statement. You have a 1-indexed array with N integers, and you want to perform some Q queries on it.

1. `1 p x` : change index `p` to `x`, where $1 \leq x \leq 10^8$
2. `2 1 r` : perform the **OR** bitwise operation on all pairs from `1` to `r`, inclusive, then sum them
3. `3 1 r` : perform the **AND** bitwise operation on all pairs from `1` to `r`, inclusive, then sum them
4. `4 1 r` : perform the **XOR** bitwise operation on all pairs from `1` to `r`, inclusive, then sum them

Input Specification

The first line will contain N and Q, $1 \leq N \leq 10^5$, $1 \leq Q \leq 10^4$.

The second line will contain N integers.

The next Q lines will contain valid queries.

For **30%** of the points, $\{N, x\} \leq 10$, $Q \leq 50$.

Output Specification

For each query from 2 to 4, output the sum.

Sample Input 1

```
6 1
4 4 8 10 4 6
2 3 6
```

Sample Output 1

```
70
```

Explanatioin

For the query from $L = 3$ to $R = 6$, there are 6 pairs:

$8|10 = 10$, $8|4 = 12$, $8|6 = 14$, $10|4 = 14$, $10|6 = 14$, $4|6 = 6$.

So the total sum is $10 + 12 + 14 + 14 + 14 + 6 = 70$.