Problem E. Three Queries

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	256 megabytes

Given an array a of length n and q queries. We also have a binary array w of infinite length, initially all $w_i = 1$.

There are three types of queries:

1. "1 x" — toggle the value of w_x (from 1 to 0, and vice versa).
2. "2 l r" — count the number of unique numbers in the array a in the range $[l, r]$ for which $w_{a_i} = 1$ and $l \le i \le r$.
3. "3 x t" — assign the value t to a_x.

Provide an answer for each query of the second type.

Input

The first line contains two integers n and q ($1 \le n, q \le 3 \cdot 10^5$) — the length of the array and the number of queries.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$) — the values of the elements of the array.

Each of the following q lines starts with an integer *type* ($1 \le type \le 3$) — the type number of each query:

1. If $type = 1$, the query contains one integer x ($1 \le x \le 10^9$) — toggle the value of w_x.
2. If $type = 2$, the query contains two integers l and r ($1 \le l \le r \le n$) — count the number of unique numbers in the array a in the range $[l, r]$ for which $w_{a_i} = 1$ and $l \le i \le r$.
3. If $type = 3$, the query contains two integers x and t ($1 \le x \le n, 1 \le t \le 10^9$) — replace the value of a_x with t.

Output

For each query of the second type, output the number of unique numbers in the range on a separate line.

Scoring

1. (8 points): $n, q \le 10^3$;
2. (6 points): only queries of type 2; $n = q; l_i = 1$; $r_i = i$;
3. (13 points): only queries of type 2;
4. (10 points): only queries of type 1 and 2; all a_i are pairwise distinct;
5. (14 points): only queries of type 1 and 2; all w_{a_i} can change only once;
6. (7 points): only queries of type 1 and 2;
7. (14 points): only queries of type 2 and 3;
8. (8 points): at any moment, $a_i \le 100$;
9. (10 points): $n, q \le 5 \cdot 10^4$;

10. (10 points): without additional constraints.

Example

standard input	standard output
10 5 3 4 3 4 3 2 3 1 2 1 2 2 5 1 3 2 2 5 3 4 5 2 2 5	2 1 2

Note

In the example for the first query of the second type, the segment looks like $[4, 3, 4, 3]$, meaning there are numbers 3, 4, and w_3, w_4 are equal to 1, so the answer is 2. After the next query of type 1, w_3 becomes 0, so for the next query, the answer is 1. After the next query, the array will look like $[3, 4, 3, 5, 3, 2, 3, 1, 2, 1]$. In the last query, the segment will look like $[4, 3, 5, 3]$, meaning there are numbers $3, 4, 5$, respectively the answer is 2, because $w_3 = 0$.