Problem N
Frequency Function

Let's define a function $f(a)$ which takes as an argument a sequence of n integers $a_1, a_2, \ldots a_n$ in the range $[0, n]$ and returns a sequence $b_1, b_2, \ldots b_n$ such that b_i is the number of occurrences of the number i in the sequence $a_1, a_2, \ldots a_n$.

Additionally, let's define its k-fold composition:

$$f^k(a) = \begin{cases} a & \text{for } k = 0, \\ f(f^{k-1}(a)) & \text{for } k > 0. \end{cases}$$

You are given a sequence $a_1, a_2, \ldots a_n$. Your task is to handle two types of queries:

- 1 v x – Change the value of a_v to x.
- 2 k v – Print the v-th element of the sequence $f^k(a)$.

Input

The first line of the input contains two integers n and q ($1 \le n \le 300\,000; 1 \le q \le 500\,000$), representing the length of the input sequence and the number of queries, respectively.

The second line of the input contains a sequence of n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le n$).

The next q lines contain descriptions of the queries in the format specified in the problem statement. It holds that $1 \le v \le n$, $0 \le x \le n$ and $0 \le k \le 300\,000$.

It is guaranteed that there will be at least one query of the second type.

Output

The output should contain as many lines as there are queries of the second type. The i-th line should contain a single integer – the answer to the i-th query of the second type.

Example

For the input data:

```
6 6
2 1 2 3 0 3
2 3 2
1 5 2
2 0 2
1 2 3
2 0 2
2 2 3
```

the correct result is:

```
1
1
3
2
```

Explanation: Let's analyze the last query. We have:

- $f^0(a) = [2, 3, 2, 3, 2, 3]$,
- $f^1(a) = [0, 3, 3, 0, 0, 0]$,
- $f^2(a) = [0, 0, 2, 0, 0, 0]$.

The answer to this query is 2.