E. Tourists

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

There are n cities in Cyberland, numbered from 1 to n, connected by m bidirectional roads. The j-th road connects city a_j and b_j.

For tourists, souvenirs are sold in every city of Cyberland. In particular, city i sell it at a price of w_i.

Now there are q queries for you to handle. There are two types of queries:

- "C a w": The price in city a is changed to w.
- "A a b": Now a tourist will travel from city a to b. He will choose a route, he also doesn't want to visit a city twice. He will buy souvenirs at the city where the souvenirs are the cheapest (possibly exactly at city a or b). You should output the minimum possible price that he can buy the souvenirs during his travel.

More formally, we can define routes as follow:

- A route is a sequence of cities $[x_1, x_2, ..., x_k]$, where k is a certain positive integer.
- For any $1 \le i < j \le k, x_i \ne x_j$.
- For any $1 \le i < k$, there is a road connecting x_i and x_{i+1}.
- The minimum price of the route is $min(w_{x_1}, w_{x_2}, ..., w_{x_k})$.
- The required answer is the minimum value of the minimum prices of all valid routes from a to b.

Input

The first line of input contains three integers n, m, q ($1 \le n, m, q \le 10^5$), separated by a single space.

Next n lines contain integers w_i ($1 \le w_i \le 10^9$).

Next m lines contain pairs of space-separated integers a_j and b_j ($1 \le a_j, b_j \le n, a_j \ne b_j$).

It is guaranteed that there is at most one road connecting the same pair of cities. There is always at least one valid route between any two cities.

Next q lines each describe a query. The format is "C a w" or "A a b" ($1 \le a, b \le n, 1 \le w \le 10^9$).

Output

For each query of type "A", output the corresponding answer.

Examples

input
3 3 3 1 2 3 1 2 2 3 1 3 A 2 3 C 1 5 A 2 3

output
1 2

input

```
7 9 4
1
2
3
4
5
6
7
1 2
2 5
1 5
2 3
3 4
2 4
5 6
6 7
5 7
A 2 3
A 6 4
A 6 7
A 3 3
```

output

```
2
1
5
3
```

Note

For the second sample, an optimal routes are:

From 2 to 3 it is $[2, 3]$.

From 6 to 4 it is $[6, 5, 1, 2, 4]$.

From 6 to 7 it is $[6, 5, 7]$.

From 3 to 3 it is $[3]$.