Problem E. Café Note

"In the Café of Lost Youth" is one of the famous novels written by author Patrick Modiano. This novel won him a Nobel prize in Literature.

It is a special story about a small coffee shop in Paris of the 1950s - the shadowy and shady time of this city with criminals, drinkers and drifters. In this coffee shop, there are many guests who drop by to drink, to smoke or just to talk and meet others. The enigmatic thing about those people is that they don't tell others their real names, because most of them are afraid people can know who they are or even their pasts. Hence, the owner of this coffee shop name one another by a nickname.

Everyday this owner uses a notebook to record who come to his shop. By his observation, for each guest, the owner also knows who he/she likes or doesn't. For example, he notes person A likes person B or person A doesn't like person B. The relations are bidirectional, meaning that if person A likes person B then person B also likes person A; if person C doesn't like person D then person D doesn't like person C either. He also realizes:

- If person A likes person B and person B likes person C then person A and person C also like each other.
- If person A likes person B and person B doesn't like person C then person A and person C don't like each other.

When two people who don't like each other sit in the same table, they can cause troubles and it can be worse if they go with their group. As the owner of the café shop, he doesn't let any conflicts happen in his place. He is not good at math and logic so he needs a program so that he can add new relation of 2 people. If he adds a wrong relation, for instance, A likes B, B doesn't like C and C likes A, this program can detect and ignore the third one by the first 2 relations. With this program, he wants to know relation of 2 people by entering their names, for this kind of query, the program should say they like each other or not, or they don't even know who the other one is.

Input

The first line of input contains 3 integers n, m and q, where:

- n is the number of guests ($2 \le n \le 10^5$)
- m is the number of relation ($1 \le m \le 10^5$)
- q is the number of queries ($1 \le q \le 10^5$)

The second line contains n distinct names w_1, w_2,…, w_n (length ≤ 20)

Next, there are m lines, each line contains 3 information with format r $name_1$ $name_2$, where:

- $name_1$ and $name_2$ are the names of 2 guests
- r is an integer number with the value of 0 or 1. 0 if they like each other, otherwise 1.

Then q lines follow, each line contains a pair of name which the program should return their relation

Output

For each query, the program should return:

- 0 if they like each other
- 1 if they doesn't like each other
- 2 if they don't know each other.

Examples

Standard Input	Standard Output
3 3 4 duwelz louki danni 0 louki danni 1 louki duwelz 0 duwelz danni louki danni louki duwelz danni duwelz duwelz danni	0 1 1 1
3 1 2 a b c 0 a b b a b c	0 2