Magical furnace

Description

Motivation

Long long ago, underneath the material tower at ShanghaiTech university, there is a mysterious lab. In the lab, a magical furnace is there. No one know who built that. There is only a manual for that and an experiment worksheet left by a crazy scientist.

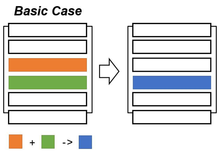
Furnace manual

The unknown sage defines some rules to use it:

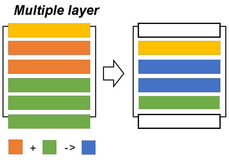
1. When add substances, you must add it from the top.
2. When remove substances, you can only remove it from the bottom.

In the furnace, some rules are found when reaction takes place:

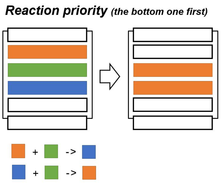
1. only adjacent layer reacts



2.If layer of the same substance stacked, the reaction will regard them as an integrity. For example, if A + B -> C, then 3 layers of substance A and 2 layers of substance B will consume 2 layers of substance of A&B, and generate the 2 layers of substance at the middle.



3. If one of the layer can react with the upper one and the lower one at the same time, the reaction with lower layer takes place first.



4. The newly generated substance can be input of other chemical reactions.

5. Due to the gravity, there is no hole between layers of substance after chemical reactions. The upper substance will automatically falls down.

Experiment worksheet

In experiment, you will use at most n kinds of substance, indexed by 1 to n.

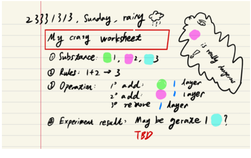
Among those n kinds of substance, m rules of chemical reaction exist. Each rule transforms two different substance into another one(the three substance involved in a rule are different).

In a whole process of experiment. At first, the magical furnace is empty. Then, Apply a seqence of addition and removal of substance. Between operations, all the substance are fully interacted and steps to a stable condition.

Goal

In the worksheet, k operations are recorded. You have verfied all operations are legal: there is no overflow(You can assume the furnace large enough) or underflow(remove from an empty furnace).

In order to clean the furnace, you are trying to estimate how many layers of substance left in furnace after the experiment.



An example of worksheet from a crazy scientist.

Input

At first line, there are three integers.

1. n: # substance
2. m: # rules of chemical reaction
3. k: # operations

Then, for next m lines, each line includes three integers x, y, z: indicating the rule of x + y -> z.

Finally, for the last k lines, each line includes three integers s, q:

1. s: the index of input substance. If the operation is to remove/output, s is set to -1 by default.
2. q: # layers of substance added/removed to/from the furnace.

e.g: s = 5, q = 2 means add 2 layers of substance 5 to at top of the furnace.

e.g: s = -1, q = 2 means remove 2 layer of substance from the bottom.

- For 50% TestCase, n ≤ 20, m ≤ 30, k ≤ 50
- For 80% TestCase, n ≤ 1000, m ≤ 5000, k ≤ 10000
- For 100% TestCase, n ≤ 3000, m ≤ 100000, k ≤ 300000

Output

Only an integer in one line, indicating the layers of substance left in the furnace.

输入样例 1 📋

```
5 5 10
2 3 4
1 4 3
1 2 0
0 4 2
2 4 0
0 885
2 1011
4 461
2 1551
2 995
2 1276
0 1387
-1 1844
0 1863
1 276
```

输出样例 1

```
7400
```

提示

We provide compiled AC code on Ubuntu/Windows. If you are puzzled with the input/output, you can write your own testcase based on it.

This code could only handle legal input.

Windows version:mf.exe

Ubuntu version:mf.o