Task 5

# Quality Inspection

## Task

You are responsible for quality management in a factory manufacturing certain machines. These machines consist of three parts: a power supply, a motor, and a cable. There are $a$ power supplies, $b$ motors, and $c$ cables in the factory, and they are labelled as 1 to $a$, $a + 1$ to $a + b$, and $a + b + 1$ to $a + b + c$, respectively. The trouble is that there may be broken parts among these. The factory wants to know which parts are broken and which are working.

For this purpose, the parts were examined in the following manner: pick a power supply, a motor, and a cable, connect them, and turn on the machine. If all of the three parts are working, then the machine works correctly and the test is successful. Otherwise, the machine does not work correctly and the test fails. (Note that the machinery in question needs an extreme precision to work. It will not work by any chance if any of its parts is broken.)

You are given a list of the results of examination. Each row in the list consists of the labels of the power supply, the motor and the cable used in the test, and whether the test was successful or not.

Write a program which, given the list of the examination results, classifies all the parts into three categories: the parts which are known to be broken according to the results, the parts which are known to be working, and the parts which are not known to be broken or working.

## Input

The format of each input file is as follows.

Line 1 consists of 3 space-separated integers: the number $a$ of the power supplies, the number $b$ of the motors, and the number $c$ of the cables.

Line 2 consists of a single integer $N$, the number of tests in the list of the examination results.

The following $N$ lines represent the list of the examination results. Each of these lines consists of 4 space-separated integers $i, j, k, r$, representing that when power supply $i$, motor $j$ and cable $k$ were connected, the test was successful (if $r = 1$) or failed (if $r = 0$).¡/p¿

$a, b, c, N$ satisfy $1 \leq a, b, c \leq 100$, $1 \leq N \leq 1000$.

## Output

The format of each output file to submit is as follows. The file consists of $a + b + c$ lines. Line $i$ ($1 \leq i \leq a + b + c$) should read:

- 0 if part $i$ is known to be broken according to the examination results.
- 1 if part $i$ is known to be working according to the examination results.
- 2 if part $i$ is not known to be broken or working according to the examination results.

## Sample input and output

### Sample input

```
2 2 2
4
2 4 5 0
2 3 6 0
1 4 5 0
2 3 5 1
```

### Sample output

```
2
1
1
0
1
0
```