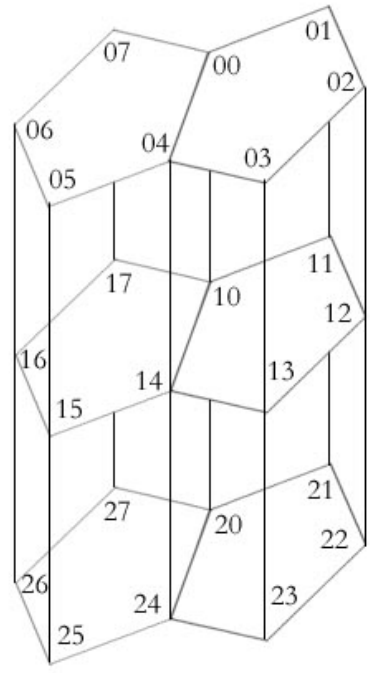
Yes, you are in an octal world. Here all people use **Octal Number System (Base 8)**. They have invented all the symbols '0', '1', '2', '3', '4', '5, '6', '7'. They dont know what is '8', but if you see their houses, you can find the '8' shape.

Their world is a multilevel world (not like the earth). In each level there are houses numbered from 0 to 7 and combining with the level you will get the house position. So, a house numbered 5 in level 3 is recognized as 35, a house numbered 7 in level 0 is recognized as 07 as shown in the picture. And the levels are numbered from 0 to 7, 10 to 17, 20 to 27, ... There are several two way roads connecting the houses. There are two rules:



Rule 1:

In a level the ith house is connected to the jth house by a road if the absolute difference between i and j is 1 or 7. And there is a special road between house 0 and 4.

So, there exists a road between 02 and 03, 20 and 27, 70 and 74. But there is no road between 02 and 04, 05 and 07.

Rule 2:

If the level is different, and the difference is 1, then there is a road if two house numbers are same.

So, there exists a road between 02 and 12, 52 and 42, 107 and 117. But there is no road between 12 and 32, 45 and 57.

You were visiting this weird world. Suddenly you saw that in the 32nd house there is a sign — '**Programmer Wanted!!!**'. You smiled a bit and went to that house immediately. There were a lot of applicants. Like others, you were given a problem. The problem stated,

"We want to color all the roads of our beautiful world. The roads connected to same house must have different colors. And you will be given some roads which should be colored different. You have to find the minimum number of colors to color them all. And you have only **6** hours."

Input

"The input file contains several sets of inputs. The total number of sets will be less than 100. The description of each set is given below:

Each set starts with three integers $L1$, $L2$ ($0 \leq L1 \leq L2 \leq 1000000$) and M ($M \geq 0$). We want to color all the roads from level $L1$ to level $L2$ (inclusive). The next M lines will contain 4 houses a, b, c, d separated by single spaces. That means the road between (a, b) and between (c, d) should be colored different. You can assume that all the inputs are valid and $(L2 - L1) \leq 2$.

The input will be terminated by the set where $L1 > L2$. And this set should not be processed."

Output

"For each set in the input, you should print one line containing the minimum number of colors needed."

Sample Input

```
1 1 0
2 3 1
26 27 30 34
0 0 10
04 05 00 01
00 07 04 05
03 04 00 07
00 01 03 04
02 03 05 06
00 07 02 03
04 05 06 07
01 02 05 06
102 101 0
```

Sample Output

```
3
4
5
```