Strange Food Chain

There are 3 kinds of animals A,B and C. A can eat B,B can eat C,C can eat A. It's interesting,isn't it?

Now we have n animals,numbered from 1 to n. Each of them is one of the 3 kinds of animals:A,B,C.

Today Mary tells us k pieces of information about these n animals. Each piece has one of the two forms below:

- 1 x y: It tells us the kind of x and y are the same.
- 2 x y: It tells us x can eat y.

Some of these k pieces are true,some are false. The piece is false if it satisfies one of the 3 conditions below, otherwise it's true.

- X or Y in this piece is larger than n.
- This piece tells us X can eat X.
- This piece conflicts to some true piece before.

Input

The first line contains a single integer t.t blocks follow.

To every block,the first line contains two integers n(1<=n<=50000) and k (1<=k<=100000). k lines follow,each contains 3 positive integers D(1<=D<=2),X,Y,separated by single spaces.

Output

t lines,each contains a single integer - the number of false pieces in the corresponding block.

Example

Sample input:
```
1
100 7
1 101 1
2 1 2
2 2 3
2 3 3
1 1 3
2 3 1
1 5 5
```

Sample output:
```
3
```

Hint:

The false pieces are the 1st,the 4th and the 5th ones.