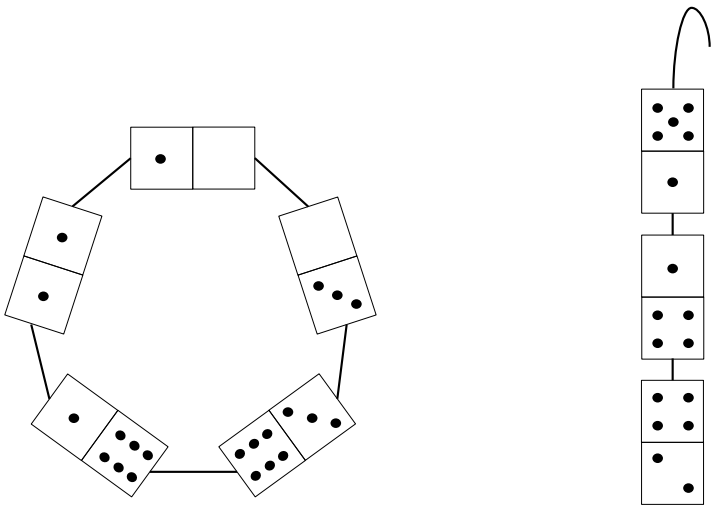
Domino Jewelry

It could have been all so much fun! And now Lea is lying all by herself in a hospital in a random Austrian village. What happened? A couple of weeks ago, Lea qualified to participate in this year's official ICPC training camp of the prestigious Technical University of Garchobirsk. Since Lea was afraid that the other participants were introverted, socially awkward nerds with vitamin D deficiency, she took her precious bottle of Cetraria Islandica hard liquor (Islandic moss liquor) with her to be able to cheer herself up if things became as bad as anticipated.

After having dominated the first two contests, she rewarded herself with a couple of shots before going to bed. Even though Lea is an experienced drinker, she woke up with a stomach ache the next morning. However, this did not stop her from joining the others on a hiking trip. But after having walked a couple of miles, her medical condition suddenly worsened. The next thing Lea remembered was hanging on the rope attached to an emergency helicopter that took her to the closest hospital.

A couple of hours later, Lea already feels a bit better - but now she is bored to death. Eventually, the medical stuff hands her a set of dominoes. After having played several rounds against herself, she suddenly gets the brilliant idea to make jewelry out of the dominoes! She either wants to make a necklace or a single dangle earring. And of course both the necklace and the earring should comply with the well-known domino rules: The sides of adjacent dominoes should always show the same number of points. However, in case of an earring Lea does not care if the upper side of the first domino piece matches lower side of the last domino piece. To visualize her demands, Lea quickly sketched an example of a valid necklace and earring:



Because there are only a few domino pieces, Lea wants to use all of them to either make a necklace or an earring. No domino piece should be left after she is done. Lea would like to have a program that lets her know in advance if it is even possible to craft a necklace or an earring with respect to her demands. Unfortunately, she still feels a bit dizzy from the helicopter ride. But maybe you can help her out?

Input

The first line of the input contains an integer t. t test cases follow, each of them separated by a blank line.

Each test case starts with two integers n k, where n is the total number of dominoes and k is the number of distinct dominoes up to rotations. k lines follow describing one kind of domino piece. Each line contains three integers a_i b_i c_i where a_i and b_i describe the two sides of the i-th kind of domino piece and c_i is the number of available domino pieces of the i-th kind.

Output

For each test case, output one line containing "Case #i: s_1 s_2" with i being the number of the test case starting at 1, and s_1 being "yes" if it is possible to craft a domino necklace out of all the available pieces such that no piece is unused, and "no" otherwise. Similarly, s_2 should be "yes" if it is possible to craft a domino dangle earring out of all the available pieces such that no piece is unused, and "no" otherwise.

Constraints

- $1 \leq t \leq 100$
- $2 \leq n \leq 10^8$
- $1 \leq k \leq n$
- $0 \leq a_i \leq b_i \leq 10^5$ for all $1 \leq i \leq k$
- $1 \leq c_i \leq n$ for all $1 \leq i \leq k$
- $\sum_{i=1}^{k} c_i = n$

Sample Explanation

The first and second sample test case refer to the necklace and earring shown in the problem statement.

Sample Input 1

```
3
5 5
0 1 1
1 1 1
1 6 1
3 6 1
0 3 1

3 3
1 5 1
1 4 1
2 4 1

10 5
1 1 3
6 6 2
1 2 1
5 6 3
2 5 1
```

Sample Output 1

```
Case #1: yes yes
Case #2: no yes
Case #3: no yes
```

Sample Input 2

```
8
4 4
0 2 1
0 5 1
2 4 1
4 5 1

6 2
0 2 2
2 2 4

6 2
0 4 4
4 4 2

6 5
1 2 1
1 3 2
1 4 1
2 3 1
3 4 1

6 4
0 4 2
0 5 1
4 5 1
5 5 2

4 4
0 5 1
1 4 1
4 4 1
4 5 1

6 4
0 4 1
1 3 1
3 3 1
3 4 3

5 4
2 3 2
2 4 1
3 4 1
4 4 1
```

Sample Output 2

```
Case #1: yes yes
Case #2: yes yes
Case #3: yes yes
Case #4: yes yes
Case #5: no yes
Case #6: no yes
Case #7: no yes
Case #8: no yes
```