Diplomacy

International relations are hard. In the light of some recent international crisis, Lea's school decided that graduates should at least have a basic understanding of why that is. So, they set up a simulation of an international meeting for their graduates where every person represents a different country and has their own agenda. Lea decided to participate and so, she got her own agenda: As a representative of one of the larger countries, she wants to sway the course of history in her favour by rallying an alliance of countries that are able to overcome the resistance of all the other countries. For that, she gathered allies by making friends through diplomatic relations.

However, there are some countries that just hate one another because one country killed the king of the other country some hundreds of years ago. So, Lea has to pick up on the small, intricate signs of mutual hate or friendliness between the other countries' representatives. For example, she might pick up a small, intimate grin shared between the representatives of Templonia and Poorland and concludes that the two may be allied and plotting her downfall. Or she might see the representative of Beachistan slip some ominous powder into the drink of the representative of another country and infer that these two will probably not form an alliance anytime soon.

She also uses some basic properties of friendship and animosity:

- The friends of my friends are my friends as well.
  If x and y are allied and y and z, then x and z are allied as well.
- Friendship is mutual.
  If x is allied with y, then y is allied with x.
- Hatred is mutual.
  If x hates y, then y hates x.
- A common cause unites people.
  If x hates z and y hates z, then x and y form an alliance.
- An alliance has common enemies.
  If x is allied with y and x hates z, then y hates z as well.

After picking up on all these hints, can you tell her if her alliance gathered more than half of all the countries? This would establish a very powerful position for Lea (and her country, of course) from which she can use diplomacy to batter the rest of her enemies into submission (trade sanctions, for example).

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 begins with a line consisting of two integers n, the number of countries, and m, the number of interactions between countries. The countries are numbered from 1 to n, with Lea representing country number 1. m lines follow, signaling a sign for either friendship or antipathy between the representatives of two countries. The i-th line is either `F` x y, signaling friendship or `A` x y, signaling antipathy between countries x and y.

Output

For each test case, output one line containing "Case #i: r" where i is its number, starting at 1, and r is "yes", if Lea's alliance has gathered more than half of all countries and "no" otherwise. Each line of the output should end with a line break.

Constraints

- $1 \leq t \leq 20$
- $1 \leq n \leq 20000$
- $0 \leq m \leq 75000$

- $1 \leq x, y \leq n, x \neq y$
- The given relations will not be inconsistent (no two countries will be allies and enemies at the same time).

Sample Input 1

```
2
5 3
F 1 2
A 2 3
A 3 4

5 3
F 1 2
A 2 3
F 4 5
```

Sample Output 1

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

Sample Input 2

```
5
3 3
A 3 1
F 2 1
A 2 3

5 1
F 5 1

3 1
F 3 2

5 4
F 3 5
F 5 1
F 1 2
F 1 5

4 2
A 2 4
A 4 2
```

Sample Output 2

```
Case #1: yes
Case #2: no
Case #3: no
Case #4: yes
Case #5: no
```