

C: Enemy of my Enemy is my Friend

Consider the old maxim “The enemy of my enemy is my friend”. In difficult times, alliances can become very convoluted. Your task is to bring a bit of clarity to such times, assuming the maxim does describe reality. You will be provided with a list of relationships between pairs of persons. The relationship may be “friend” or “enemy”. There may be additional relationships that are not included in the list, but these can all be deduced by applying the above maxim. Your specific task is to determine if a proposed invitation list includes only mutual friends. Consider only the reported friends and the friends deduced by using the maxim.

Input

Input may consist of multiple cases. Each case begins with a line containing exactly two integers representing the number of lines of relationship information and the number of proposed invitation lists (one per line) respectively for the case.

Each of the relationship lines begins with either the letter ‘f’ or ‘e’, a number p from 2 to 5, followed by a list of p names, all delineated by spaces. In case of ‘f’, the names will be of mutual friends. In case of ‘e’, the names will be of mutual enemies. (Hint - the number of mutual enemies will never be more than 2. Why?)

Each of the proposed invitation list lines begins with a number i from 2 to 8 followed by i of the names included in the relationships. Again, everything is delineated by spaces.

Names will consist of single words of 2 to 10 letters. Input is case sensitive. There will be from 1 to 100 names in a case. The last case is followed by a line with two 0’s (zeroes).

The input will be such that no contradictory relation status will be deducible.

Output

For each case, display the case number followed by the ‘yes’ and ‘no’ answers to each of the proposed invitation lists, formatted as in the sample. A ‘yes’ means the list is of mutual friends. A ‘no’ means there is at least one enemy relationship or non-existent relationship (a couple that are neither friend or enemy) in the list.

Sample Input

```
6 4
e 2 Tom Fay
f 3 Fay Mae Joe
f 2 Al Mae
e 2 Sam Tom
e 2 Tom Al
f 2 Sam Mae
3 Mae Fay Joe
3 Sam Al Fay
2 Joe Al
3 Fay Sam Tom
0 0
```

Sample Output

```
Case 1: yes yes no no
```
