

## 12348 Fun Coloring

Consider the problem called FUN COLORING below.

### FUN COLORING PROBLEM

INSTANCE: A finite set  $U$  and sets  $S_1, S_2, S_3, \dots, S_m \subseteq U$  and  $|S_i| \leq 3$ .

PROBLEM: Is there a function  $f : U \rightarrow \{RED, BLUE\}$  such that at least one member of each  $S_i$  is assigned a different color from the other members?

Given an instance of FUN COLORING PROBLEM, your job is to find out whether such function  $f$  exists for the given instance.

### Input

In this problem  $U = \{x_1, x_2, x_3, \dots, x_n\}$ . There are  $k$  instances of the problem. The first line of the input file contains a single integer  $k$  and the following lines describe  $k$  instances, each instance separated by a blank line. In each instance the first line contains two integers  $n$  and  $m$  with a blank in between. The second line contains some integers  $i$ 's representing  $x_i$ 's in  $S_1$ , each  $i$  separated by a blank. The third line contains some integers  $i$ 's representing  $x_i$ 's in  $S_2$  and so on. The line  $m + 2$  contains some integers  $i$ 's representing  $x_i$ 's in  $S_m$ . Following a blank line, the second instance of the problem is described in the same manner and so on until the  $k$ -th instance is described. In all test cases,  $1 \leq k \leq 13$ ,  $4 \leq n \leq 22$ , and  $3 \leq m \leq 111$ .

### Output

For each instance of the problem, if  $f$  exists, print a 'Y'. Otherwise, print 'N'. Your solution will contain one line of  $k$  'Y's (or 'N's) without a blank in between. The first 'Y' (or 'N') is the solution for instance 1. The second 'Y' (or 'N') is the solution for instance 2, and so on. The last 'Y' (or 'N') is the solution for instance  $k$ .

### Sample Input

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

7 7
1 2
1 3
4 2
4 3
2 3
1 4
5 6 7
```

## Sample Output

YN