Problem G

Cycles

(Time Limit: 1 second)

The ACM kingdom has $n \geq 2$ cities, numbered from 1 to n, and m (bidirectional) roads. Each road connects two distinct cities. For all $i, j \in \{1,2,\ldots,n\}$, there is at most one road connecting cities i and j. We want to know whether both conditions below hold:

- The ACM kingdom is connected. That is, city i is reachable from city j via a finite number of roads for all $i, j \in \{1,2,\ldots,n\}$.
- The ACM kingdom has at least two distinct cycles. Here a cycle starts at a city, goes through a positive number of roads and finally ends at the starting city. Except for the starting city, no city can appear twice on a cycle. Furthermore, two cycles are said to be distinct as long as their sets of roads are not exactly the same.

If the two conditions above hold, we would like to further know whether the ACM kingdom has at least three distinct cycles.

Input Format

The first line is the number of test cases. The first two lines of each test case are n and m, in that order. Then each of the m roads is specified by the two cities (separated by a space) that it connects.

Output Format

Each test case requires the following output: If it is not true that the ACM kingdom is connected and has at least two distinct cycles, output "n" in a line. Otherwise, output "y" in a line if the ACM kingdom has exactly two distinct cycles and "y: there are at least three cycles" in a line if the ACM kingdom has at least three distinct cycles.

Technical Specification

- There are at most 15 test cases.
- $2 \leq n \leq 9$.

Example

Sample Input:	Sample Output:
3 9 10 1 2 1 3 3 5 5 6 5 7 7 3 2 4 9 4 4 8 2 8 6 7 4 3 4 5 4 6 1 4 2 4 3 5 5 6 3 2 1 2 3 2	y y: there are at least three cycles n