Bot Brothers

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Doodle and Doddle are robot brothers who love playing games together.

Today's game is as follows:

There is a rooted tree with n nodes, among which there are m ($m \geq 3$) leaves (nodes with degree 1 and not the root node), and the leaves are numbered in a permutation from 1 to m.

Doodle and Doddle initially stand at the root node n, and they take turns performing the following operations, with Doodle going first:

- If the current node is a leaf, do nothing.
- If the current node is not a leaf, choose one of its child nodes in the tree and move to that child node.

When both players reach a leaf, the game ends. Let the leaf where Doodle stands be numbered x, and Doddle be numbered y.

- If $x \bmod m = (y + 1) \bmod m$, then Doodle wins.
- If $(x + 1) \bmod m = y \bmod m$, then Doddle wins.
- Otherwise, it's a tie.

Doodle and Doddle are both extremely smart robots, so they will definitely adopt the optimal strategy.

Please determine who will win in the end.

Input

There are multiple test cases. The first line of the input contains a single integer T ($1 \leq T \leq 10^5$), indicating the number of the test cases. For each of the test case:

The first line contains two integers n ($4 \leq n \leq 10^5$) and m ($3 \leq m < n$), indicating the number of nodes in the tree and the number of leaves, respectively.

The following $n - 1$ lines each contain two integers x and y ($1 \leq x, y \leq n$), indicating an edge in the tree. It is guaranteed that nodes $1, 2, \ldots, m$ are exactly the leaves of the tree, and node n is the root of the tree.

It is guaranteed that the sum of n over all test cases does not exceed 5×10^5.

Output

For each test case, output a single line `Doodle` or `Doddle`, indicating the winner. If the game ties, output a single line `Tie`.

Example

standard input	standard output
2 6 3 1 4 2 4 3 5 5 6 4 6 5 4 1 5 2 5 3 5 4 5	Tie Doddle