CS 124 Problem Set 7

logged in as siddharthsingh@fas.harvard.edu

Due: Wednesday, April 15, 2015 11:59 pm EDT (**deadline passed**)

Problems

Problem A

A group of m caterpillars are born on a leaf shaped like a grid of size n by n,
and each caterpillar egg lies on some intersection of the grid lines.

Each caterpillar must crawl to the edge of the leaf in order to begin their journey through life. However, because caterpillars are hungry creatures, they have to eat at every step of their adventure!

Each node of the grid contains enough food for one caterpillar to continue traveling (so that no two caterpillars can travel to the same vertex as they make their ways to the edge of the leaf). Determine if it's possible for all the caterpillars to make it to the edge of the leaf.

There are T leaves on this tree, so please determine if caterpillars can make it for each leaf.

CONSTRAINTS
For test cases worth a total of 15 points:
T = 1
1 <= n <= 15
1 <= m <= n^2

For test cases worth a total of 35 points:
1 <= T <= 8
1 <= n <= 20
1 <= m <= n^2

For test cases worth a total of 50 points:
1 <= T <= 8
1 <= n <= 50
1 <= m <= n^2

TIME LIMITS
600 ms per test case for the first group.

2500 ms per test case for the second group.

3000 ms per test case for the last group.

(3x for Java, 10x for Python)

INPUT FORMAT
Line 1 gives T, the number of test cases.
Line 2 gives the pair n,m.
Lines 3 to m+2 give the coordinates of one caterpillar on the leaf. No two lines will be the same.

OUTPUT FORMAT
For each test case:

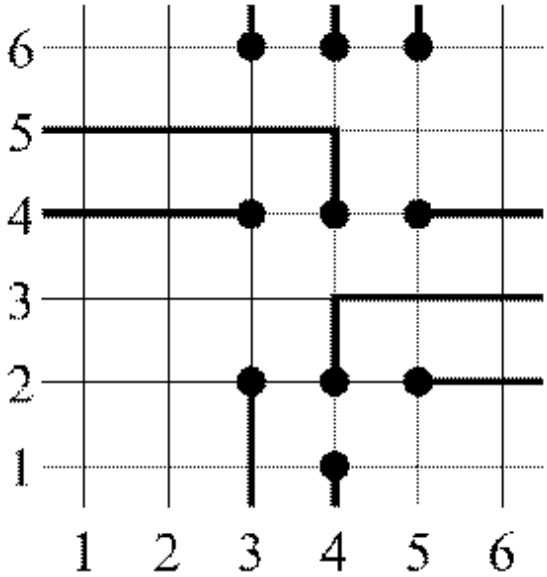
Print a line with "possible" or "not possible" indicating whether or not all caterpillars can successfully

leave the leaf.
If "not possible", print a second line for the maximum number of caterpillars that can successfully leave.

SAMPLE INPUT
1
6 10
4 1
3 2
4 2
5 2
3 4
4 4
5 4
3 6
4 6
5 6

SAMPLE OUTPUT
possible

DETAILS



SAMPLE INPUT
1
5 5
3 2
2 3
3 3
4 3
3 4

SAMPLE OUTPUT
not possible
4

Based on the "Ultra Cool Programming Contest Control Centre" v1.7b by Sonny Chan
Modified for CS 124 by Neal Wu, with design help from Martin Camacho