

Problem G. Snake

Input file: *standard input*
Output file: *standard output*
Time limit: 1 second
Memory limit: 256 mebibytes

Snake is a polyline with n vertices (without self-intersections). Initially, the coordinates of the i -th vertex of Snake is (x_i, y_i) . Snake can move continuously by translation and rotation, but it can't change its shape (the lengths of the segments in the polyline and the angles between segments can't be changed). The line $y = 0$ is a wall, and there is a small hole at $(0, 0)$. Determine whether Snake can pass through the hole. (Initially, all points on Snake satisfy $y > 0$. After the movement, all points on Snake should satisfy $y < 0$.)

Input

First line of the input contains one integer n ($2 \leq n \leq 1000$). Then n lines follow, i 'th of them contains pair of integers x_i and y_i ($0 \leq x_i \leq 10^9$, $1 \leq y_i \leq 10^9$, $(x_i, y_i) \neq (x_{i+1}, y_{i+1})$). The polyline doesn't have self-intersections. No three points are on the same line.

Output

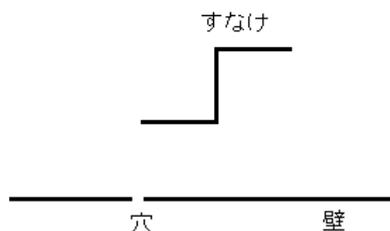
If Snake can pass through the hole, print "Possible". Otherwise print "Impossible".

Examples

standard input	standard output
4 0 1 1 1 1 2 2 2	Possible
11 63 106 87 143 102 132 115 169 74 145 41 177 56 130 28 141 19 124 0 156 22 183	Impossible

Note

For the first example, solution may look in the next way:



- Move 1 to the $-y$ direction.
- Rotate 90 degrees counter-clockwise around the point $(0, 0)$.
- Move 1 to the $-y$ direction.
- Rotate 90 degrees clockwise around the point $(0, 0)$.
- Move 1 to the $-y$ direction.
- Rotate 90 degrees counter-clockwise around the point $(0, 0)$.
- Move 2 to the $-y$ direction.