Problem 1: The Round Table of the Knights
(Problem F in Mooshak POO 2015/2016)

Submit:
- Your source code to mooshak http://mooshak.deei.fct.ualg.pt/~mooshak and
- Your report (within a zip file) to http://intranet.deei.fct.ualg.pt/POO/Entregas/

Up to October 26, 2015, 10h AM

The Round Table of the Knights

A variation of the problem **The Knights of the Round Table** presented in Steven S. Skiena, Miguel A. Revilla, *Programming Challenges*, Springer, 2003

> "King Artur is planning to build the round table in a room which has a triangular window in the ceiling. He wants the sun to shine on his round table. In particular, he wants the table to be totally in the sunlight when the sun is directly overhead at noon.
>
> Thus the table must be built in a particular triangular region of the room. Of course, the king wants to build the largest possible table under the circumstances.
>
> As Merlin is out to lunch, write a program which finds the radius of the largest circular table that fits in the sunlit area."

ADDITIONAL REQUIREMENTS

Employ the principles and techniques of Object-Oriented Programming, specially, identify and implement cohesive classes. Also, use test-driven development.

Document in your report both the UML diagram(s) and the unit tests developed, as well as all the design options taken.

SUGESTION

Refresh your geometry knowledge by visiting
http://en.wikipedia.org/wiki/Incircle_and_excircles_of_a_triangle

Input

The input has tree rows. Each row has two non-negative integers representing the x-, and y- coordinates of each triangle vertex.

Output

The output has the string “NAT” if the input does not define a triangle, or two rows otherwise.

In this last case, the first row has two non-negative integers representing the integer part of the x- and y- coordinates of the center of the round table. The second line has a non-negative integer representing the integer part of the radius of the table.

Sample Input 1

0 0
0 4
4 0

Sample Output 1

1 1
1

Sample Input 2

0 0
1 1
2 2

Sample Output 2

NAT