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Coding Area

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Coding Area

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Glass Piece

+ Problem Description

A square glass sheet of size 'S' cm fell down and broken down into N+1 pieces.

A man collected the broken pieces and he is trying to arrange the pieces to get the original shape. He found that exactly one piece is missing. To find the exact position of the missing piece, he noted down all (x,y) coordinates of each broken piece. Please help him to find the coordinates of the missing piece.

Note 1 : The input order of corners of known glass pieces are in the clockwise direction starting from the corner having least X value. If more than one corners having the same least X value, then start from the corner having least X and least Y value.

Note 2 : The corners of missing glass piece should output in the clockwise direction starting from the corner having least X value. If more than one corners have same least X value, then start from the corner having least X and least Y value.

+ Constraints

$1 < S \leq 1000$.

$1 < N \leq 50$.

+ Input Format

First line contains an integer, S, size of Glass Sheet.

Second line contains an integer, N.

Next N lines contain set of space separated integers indicates the details of N known glass pieces as follows:

- First number indicates total corners of that glass piece - say i,
- followed by $2 * i$ integers denotes X and Y coordinates of i corners, delimited by space

+ Output

Coordinates of missing piece in (X,Y) format separated by spaces.

+ Test Case

+ Explanation

Example 1

Input

400

3

5 0 0 200 0 400 200 100 250 0 250

3 200 0 400 0 400 200

4 100 250 400 200 400 400 200 400

Output

(0,250) (100,250) (200,400) (0,400)

Explanation

The size of the square glass plate is 400 cm * 400 cm. The glass plate broke into 4 pieces and he got 3 pieces.

He placed first glass piece as below figure:

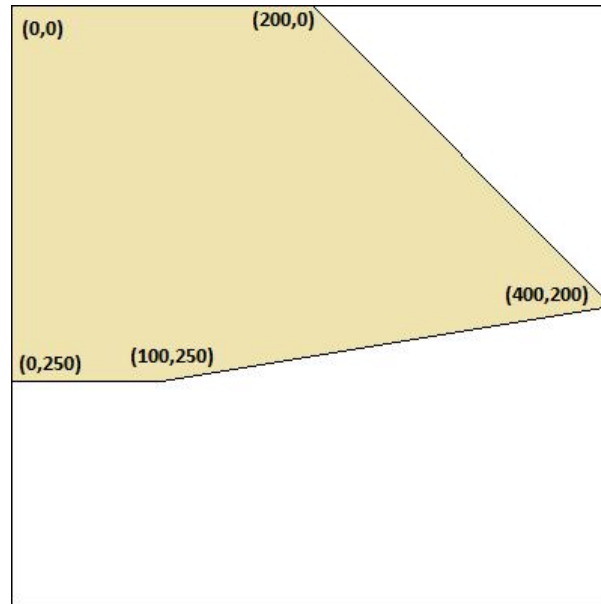


Figure. 1

Next he placed second glass piece as below figure:

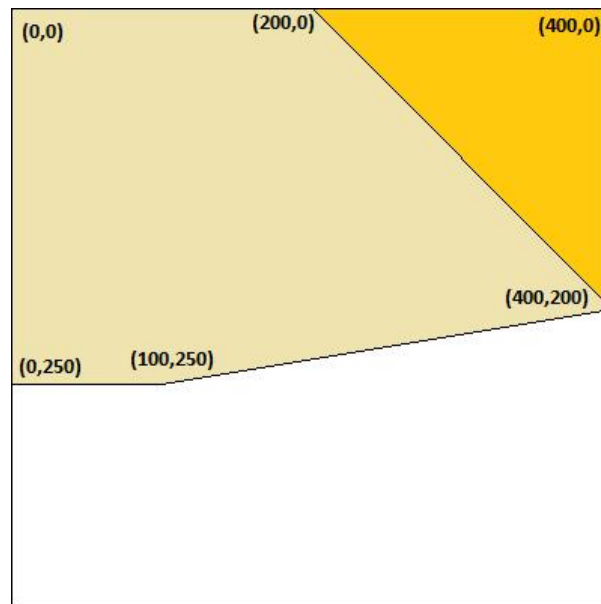


Figure. 2

Next he placed third glass piece as below figure:

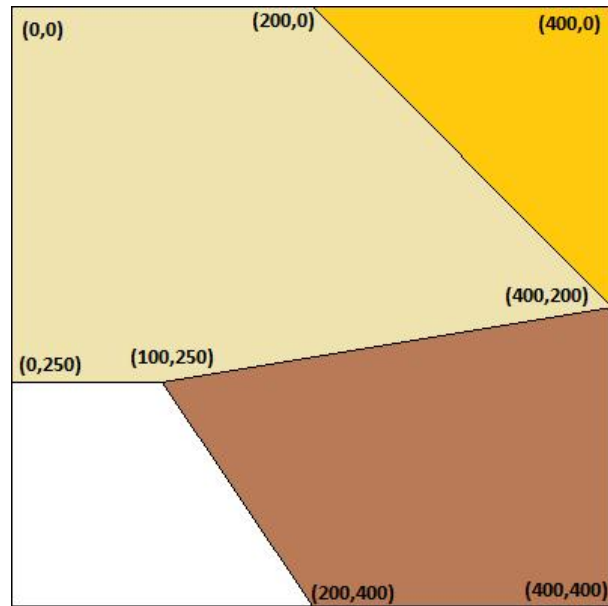


Figure. 3

Finally he found the position of the missing piece as below figure:

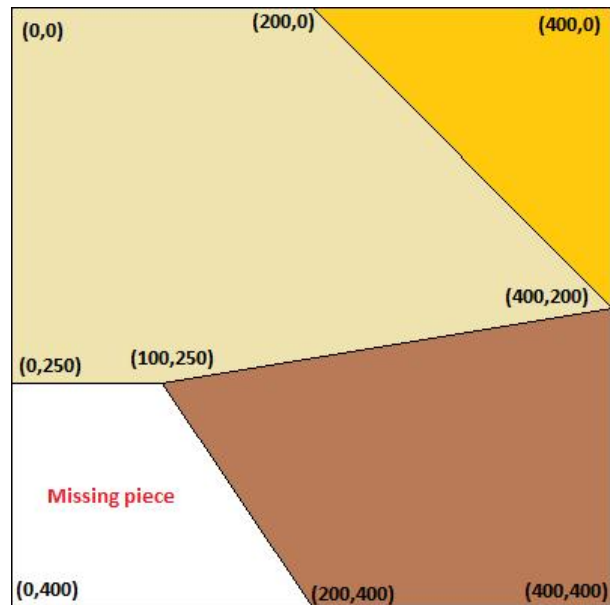


Figure. 4

Lastly, display the coordinates of missing glass piece in the clockwise direction starting from the corner (0,250), as output.

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