

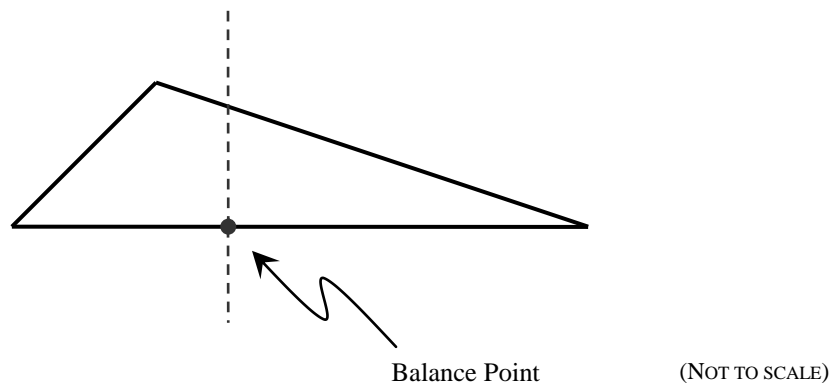
UCF Local Contest — September 5, 2009

Balance Point

filename: balance

Given an object, it's often fun to find the point at which you can balance it without it toppling over to one side. This is typically a very difficult problem, but we'd like to at least solve the problem in two dimensions for a simple shape: a scalene triangle. In particular, we will define the balance point of a scalene triangle as follows:

Find the longest side of the triangle. Then, determine the perpendicular line to this side that divides the triangle's area into two equal parts. The point at which this line intersects the longest side is known as the triangle's balance point.



The Problem:

Given the Cartesian coordinates of the three points of a scalene triangle, determine the x and y coordinates of its balance point (to 2 decimal places).

The Input:

There will be multiple triangles in the input file. The first input line contains a positive integer n , indicating the number of triangles to be processed. The triangles will be on the following n input lines, each on a separate line. Each triangle contains three pairs of x-y coordinates, denoting the three points of the triangle. Each of these six values will be real numbers in between -100 and 100, inclusive, separated by spaces. Assume that all three points are distinct and that they are not collinear, i.e., assume the points form a triangle.

The Output:

At the beginning of each test case, output "Triangle # t Balance Point: ", where t is the test case number (starting from 1). Following this header, for each triangle, print the x and y coordinates of that triangle's balance point, rounded to two decimal places, in parentheses,

separated by a comma. To clarify “rounded to two decimal places”: the output for 1.274 should be 1.27, for 1.275 should be 1.28, and for 1.276 should be 1.28.

Follow the format illustrated in Sample Output.

Sample Input:

```
2
0.0 0.0 5.0 0.0 1.8 2.4
0.0 0.0 0.0 5.0 -2.4 3.2
```

Sample Output:

```
Triangle #1 Balance Point: (2.17,0.00)
Triangle #2 Balance Point: (0.00,2.83)
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