5425   Intersecting Lines

We all know that a pair of distinct points on a plane defines a line and that a pair of lines on a plane will intersect in one of three ways: 1) no intersection because they are parallel, 2) intersect in a line because they are on top of one another (i.e. they are the same line), 3) intersect in a point. In this problem you will use your algebraic knowledge to create a program that determines how and where two lines intersect.

Your program will repeatedly read in four points that define two lines in the x-y plane and determine how and where the lines intersect. All numbers required by this problem will be reasonable, say between -1000 and 1000.

Input

The first line contains an integer N between 1 and 10 describing how many pairs of lines are represented. The next N lines will each contain eight integers. These integers represent the coordinates of four points on the plane in the order $x_1\ y_1\ x_2\ y_2\ x_3\ y_3\ x_4\ y_4$. Thus each of these input lines represents two lines on the plane: the line through (x_1, y_1) and (x_2, y_2) and the line through (x_3, y_3) and (x_4, y_4). The point (x_1, y_1) is always distinct from (x_2, y_2). Likewise with (x_3, y_3) and (x_4, y_4).

Output

There should be $N + 2$ lines of output. The first line of output should read 'INTERSECTING LINES OUTPUT'. There will then be one line of output for each pair of planar lines represented by a line of input, describing how the lines intersect: none, line, or point. If the intersection is a point then your program should output the x and y coordinates of the point, correct to two decimal places. The final line of output should read 'END OF OUTPUT'.

Sample Input

```
5
0 0 4 4 0 4 4 0
5 0 7 6 1 0 2 3
5 0 7 6 3 -6 4 -3
2 0 2 27 1 5 18 5
0 3 4 0 1 2 2 5
```

Sample Output

```
INTERSECTING LINES OUTPUT
POINT 2.00 2.00
NONE
LINE
POINT 2.00 5.00
POINT 1.07 2.20
END OF OUTPUT
```