Given the vertices of a non-degenerate polygon (no 180-degree angles, zero-length sides, or self-intersection - but not necessarily convex), you must determine how many distinct lines of symmetry exist for that polygon. A line of symmetry is one on which the polygon, when reflected on that line, maps to itself.

Input

Input consists of a description of several polygons.

Each polygon description consists of two lines. The first contains the integer n ($3 \leq n \leq 1000$), which gives the number of vertices on the polygon. The second contains n pairs of numbers (an x- and a y-value), describing the vertices of the polygon in order. All coordinates are integers from -1000 to 1000.

Input terminates on a polygon with 0 vertices.

Output

For every polygon described, print out a line saying '`Polygon #`x `has` y `symmetry line(s).`', where x is the number of the polygon (starting from 1), and y is the number of distinct symmetry lines on that polygon.

Sample Input

```
4
-1 0 0 2 1 0 0 -1
3
-666 -42 57 -84 19 282
3
-241 -50 307 43 -334 498
0
```

Sample Output

```
Polygon #1 has 1 symmetry line(s).
Polygon #2 has 0 symmetry line(s).
Polygon #3 has 1 symmetry line(s).
```