UCF "Practice" Local Contest — August 27, 2011

Simple Convex/Concave Polygons (filename: simpoly)

Given two polygons, you are to determine their common area. Each polygon may be convex or concave, but each polygon will be simple (non-intersecting sides). Also, each side of a polygon will be parallel to x-axis or y-axis.

The Input:

There will be multiple data sets, each set consisting of three input lines. The first input line of a data set will contain two even integers m ($4 \leq m \leq 30$) and n ($4 \leq n \leq 30$), indicating the number of vertices for the two polygons, respectively. The next input line will have the x and y coordinates for the vertices of the first polygon. Similarly, the next input line will have the x and y coordinates for the vertices of the second polygon. Assume that input (x and y) values are integers between zero and 1000 (inclusive) and are separated by spaces. Also assume that the vertices for a polygon are given in order (i.e., the first two vertices for a polygon will give side 1 for that polygon and vertices 2 and 3 will give side 2, etc.). End of data is indicated by a value of zero for both m and n.

The Output:

Print a heading for each data set along with the common area. Leave a blank line after the output for each data set. Follow the format illustrated in Sample Output.

Sample Input:

```
4 8
1 3     1 7     15 7     15 3
4 1     4 5     5 5     5 2     11 2     11 5     12 5     12 1
4 8
2 1     2 8     7 8     7 1
1 3     1 6     3 6     3 5     4 5     4 4     5 4     5 3
0 0
```

Sample Output:

```
Data set #1: 4

Data set #2: 6
```

The Output:

Print a heading for each input matrix. Then, echo print the matrix on consecutive output lines with a single space between letters. Then, for each request, print the message:

Symmetric diagonals r:

where r is the number of the symmetric diagonals requested. Print the symmetric diagonals on subsequent output lines. Print the upper diagonal before the lower, print the values as they appear from left to right in the matrix, and print a single space between letters. Leave a blank line after the output for each data set. Follow the format illustrated in Sample Output.

(Sample Input/Output on the next page)