6th South African Regional
ACM Collegiate Programming Competition

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Problem C – Purple balloon
Wisdom

You have recently ascended the throne of a small (and primitive) island of Italy. The inhabitants of your domain rely almost exclusively on subsistence farming for survival. This has inevitably lead to numerous squabbles over the ownership of every square millimetre of the island.

Fortunately, you, as sovereign, have come up with a truly wise solution to the problem. Whenever two neighbours are locked in a property dispute, you merge their individual properties into a single piece of land. This plot you then divide into two equal halves. Fair is fair.

Your trusted minions are responsible for surveying the land, drawing up the relevant map, and suggesting where the new border (bisecting the unified plots) should be drawn.

However, being minions by nature, you suspect that they may be susceptible to `gifts' offered by the various parties involved. You have therefore decided to double-check the fairness of the new border line suggested by your minions. (That, and you've promised yourself to fire anyone in your employ by the name of Brutus.)

Thus, given the vertices of the polygon defining the unified plot, you wish to compute the respective areas of the two plots that result after (supposed) bisection with the new border line.

Input

Each input record will start with four positive integer values defining the two endpoints of the dividing line. Note that these endpoints will typically fall outside (rather than on the boundary) of the polygon you wish to split.

These four integers should be interpreted as two (x,y) pairs. The rest of the input record will consist of further (x,y) coordinates, one for each vertex of the polygon. Note that the polygon is not explicitly closed, so that the first and the last vertex specified are implicitly connected by the last edge of the polygon. The record will be terminated by a -1.

Further records of the same format may follow immediately after the -1.

All input records will define polygons and dividing lines such that the polygon can be split into exactly two polygons.

Output

You must print out the respective areas of the two polygons obtained by splitting the input polygon with the specified dividing line.

You should print out the smaller value first, and all your output values must be rounded to the nearest integer.

Sample Input

```
540 45 1125 855
225 225 1125 225 1575 675 450 675 -1
```

Sample Output

```
222750 232875
```