

C - Minimal Circle

Input: standard input

Output: standard output

You are to write a program to find a circle which covers a set of points and has the minimal area. There will be no more than 100 points in one problem.

Input

The input contains several problems. The first line of each problem is a line containing only one integer N which indicates the number of points to be covered. The next N lines contain N points. Each point is represented by x and y coordinates separated by a space. After the last problem, there will be a line contains only a zero.

Output

For each input problem, you should give a one-line answer which contains three numbers separated by spaces. The first two numbers indicate the x and y coordinates of the result circle, and the third number is the radius of the circle.

Sample Input

```
2
0.0 0.0
3 0
5
0 0
0 1
1 0
1 1
2 2
0
```

Sample Output

```
1.50 0.00 1.50
1.00 1.00 1.41
```