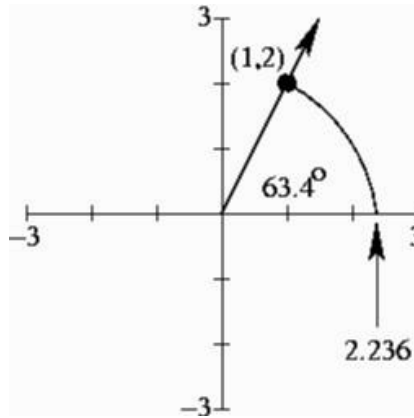


Polar Angles

Problem Statement

A point (x,y) , on the cartesian plane, makes an angle **theta** with the positive direction of the x-axis. **Theta** varies in the interval $[0, 2\pi)$ radians, i.e, greater than or equal to zero; but less than 2π radians.

For example, the polar angle of the point (1,2) as marked in this plane below, is (approximately) 63.4 degrees (multiply by $\pi/180$ to convert to radians)



Ref <http://eldar.mathstat.uoguelph.ca/dashlock/Outreach/Articles/images/PRfig1.jpg>

The Task

Given a list of points in the 2D plane, sort them in ascending order of their polar angle. In case multiple points share exactly the same polar angle, the one with lesser distance from the origin (0,0) should occur earlier in the sorted list.

Input Format

The first line contains an integer **N**.

This is followed by **N** lines containing pairs of space separated integers, **x** and **y** which represent the coordinates of the points in the cartesian plane.

Constraints

$1 \leq N \leq 1000$

$-100 \leq x, y \leq 100$

The point (0,0) will not be present in the list of points.

Output Format

The output should contain **N** lines. Each line should contain two integers **x** and **y**, corresponding to a point in the original list. Display the points in ascending order of their polar angle.

Sample Input

```
4
1 0
0 -1
-1 0
0 1
```

Sample Output

```
1 0
0 1
-1 0
```

Explanation

The point $(0,1)$ has a polar angle of 90 degrees. The point $(1,0)$ has a polar angle of 0 degrees. $(-1,0)$ has a polar angle of 180 degrees and $(0,-1)$ has a polar angle of 270 degrees.