

B. Distance From Origin

time limit per test: 2 seconds

memory limit per test: 256 megabytes

Given N points (x_i, y_i) uniformly distributed on the unit disk, sort the points in ascending order based on their distance from the origin $(0, 0)$.

Input

The first line of the input, contains number $N(1 \leq N \leq 10^7)$ – number of the points.

On the next N line, you will be given N pairs x_i and y_i ($-1 \leq x_i, y_i \leq 1$), where each pair represent a single point P_i .

Output

Print the point sorted ascending based on their distance from the origin, in format of $x_i y_i$. Each point should be printed on a new line, and the coordinates of x_i and y_i of point p_i should be in a same line separated with a white space. Print each x_i and y_i , 4 digits after the decimal point.

Example

input

Скопировать

```
5
0.5000 0.5000
-0.2000 0.0000
0.0000 0.5000
0.3000 -0.7000
-0.3000 -0.3000
```

output

Скопировать

```
-0.2000 0.0000
-0.3000 -0.3000
0.0000 0.5000
0.5000 0.5000
0.3000 -0.7000
```