Convex Hull

The Problem

Given n points in the plane, find a convex hull.

The Input

The first line of the input consists of a single integer n giving the number of points. n is 20,000 at maximum.

Each point is given as (x, y)-coordinate in a line.
Every value of the coordinate is an integer between −10,000 and +10,000.

input file name: hull.inp

The Output

List the convex hull points in ccw(counter clockwise) order. The first point should be the point with minimum x-coordinate. If more than 2 points have the same min x-coordinate, start with the one with minimum y-coordinate.

output file name: hull.out

Sample Input

```
10
-100 -100
-100 30
-100 67
30 20
200 400
200 -24
-20 45
-34 784
234 56
200 444
```

Sample Output

```
6
-100 -100
200 -24
234 56
200 444
-34 784
-100 67
```