Problem F. Grid Points

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	512 megabytes

You are given a simple polygon in the first quadrant of the Cartesian plane. This means that the coordinate (x, y) of any point in the polygon satisfies $x > 0$ and $y > 0$.

Consider all grid points in the polygon. Order them in increasing order of **slopes**. Output the k-th grid point in this order.

A grid point is a point (x, y) such that x and y are integers. A point on the boundary of a polygon is considered to be in the polygon. The slope of point (x, y) is y/x. If two points have the same slope, they are ordered lexicographically first by x, then by y. In other words, a point (x_1, y_1) is lexicographically less than (x_2, y_2) if $(x_1 < x_2) \vee (x_1 = x_2 \wedge y_1 < y_2)$.

Input

The first line contains one integer T ($1 \le T \le 500$), the number of test cases.

For each test case, the first line contains two integers n, k ($n \ge 3, 1 \le k$). Each of the next n lines describes a vertex of the polygon. Each vertex is denoted by two integers x, y ($1 \le x, y \le 10^9$), representing its coordinate (x, y). The vertices are given in counterclockwise order.

It is guaranteed that the polygon is simple, i.e. the vertices are distinct, two edges may overlap only when they are consecutive on the boundary, and the overlap contains exactly 1 point. It is guaranteed that k is no more than the number of grid points in the polygon.

It is guaranteed that the sum of n over all test cases is no more than 2000.

Output

For each test case, output two integers x, y in one line representing the coordinate (x, y) of the k-th grid point.

Example

standard input	standard output
4 3 3 1 1 3 1 3 3 4 500000000000000000 1 1 1000000000 1 1000000000 1000000000 1 1000000000 9 22 9 6 6 7 9 7 10 10 6 9 3 9 1 6 1 5 7 3 5 22447972861454999 270353376 593874603 230208698 598303091 237630296 255016434 782669452 568066304 654623868 958264153	3 2 500000000 500000000 7 8 730715389 644702744