Closest Pair

Time limit: 1 sec

Given a set of **N** points in a plane where each point is described by its coordinate (**x**, **y**). Your task is to identify the minimum distance of pairs of these points.

To avoid the problem of floating point precision, we define the distance between the point (x1, y1) and (x2, y2) as ($(x1 - x2)^2 + (y1 - y2)^2$). Moreover, the coordinate of each point is within the range of [0..30,000]. It is also guaranteed that no two points has the same coordinate.

Input

- The first line of input contain the number of points **N** (1 <= **N** <= 50,000)
- The following **N** lines, each contains two integers **X** and **Y**, gives the coordinate of each points.

Output

Output exactly one line containing the minimum distance pairs of these points.

Example

Input	Output
2 1 1 2 2 5 1	2
6 10 2 10 4 10 6 12 3 12 5 12 7	4