ETH Zurich
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HS 2015
Exercise Sheet 0

ACM Programming Challenges Lab

Exercise 1 – *Closest Pair*

Description You are given a set of points in the Euclidean plane. Your task is to determine the *square* of the shortest Euclidean distance between two points.

Note: the Euclidean distance between (x_1, y_1) and (x_2, y_2) is $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$, hence square of the distance is $(x_1 - x_2)^2 + (y_1 - y_2)^2$.

Input The first line of the input contains integer t ($1 \leq t \leq 10$), which denotes the number of test cases. Each test case starts with a line containing an integer N, which denotes the number of points in the test case. The next N lines contain two *integer* numbers each representing the coordinate of one point, the first number being the x coordinate, the second the y coordinate and $1 \leq x, y \leq 10^8$.

There are two sets of test cases. The first is a 'small' test case that is worth 30 points and where you can assume that $N \leq 1000$. In the second 'large' test case you can assume $N \leq 200000$.

Output For each test case print one line of output containing the square of the distance between the closest pair of distinct points in the test case.

Remark: Don't forget to use `ios_base::sync_with_stdio(false);` as your first line of the main procedure.

Sample input

```
1
5
1 1
1346343 11135235
234 57346
86785 23532
56 462362636
```

Sample output

```
3288503314
```