THE PARADE

Problem Statement: -

Just like every year on this Republic Day, the regiments will make a walk through the Rajpath. As they walk past the Prime Minister and the president, the lieutenant colonel will command them to stop by, as a gesture of respect.

Rajpath resembles the Cartesian plane. Regiments form a square and every soldier has a pre decided position to stop, which is given in the form of abscissa and ordinate (integer co-ordinates). The sides of the square should be parallel to coordinate axes. The square is formed in such a way that all the points are inside or on the border of the square.

Given the number of soldiers in the regiment, and their corresponding co-ordinates, calculate the minimum area covered by the regiment.

Input: -

First line of input contains an integer **T** denoting the number of test cases.
The first line of the input contains number N denoting the number of soldiers in the regiment.

Each of the next N lines contains a pair of integers X_i and Y_i denoting the coordinates of the corresponding soldiers.

Output: -

Print the minimum area of the square covered by the regiment.

Constraints: -

- $2 \leq N \leq 10^9$
- $-10^3 \leq X[i], Y[i] \leq 10^3$
- All points are pairwise distinct.

Examples: -

Input:

2

0 0

2 2

Output:

4

Input:

2

0 0

0 3

Output:

9

Problem Setter: - Yukti Swaroop