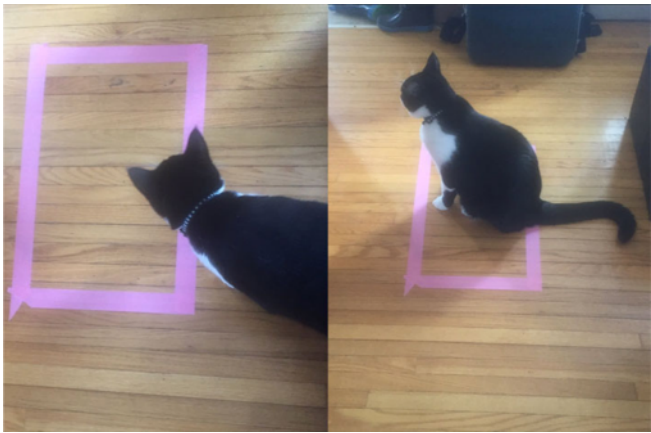


Problem B – Baker Sleeping Again.

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Most cats love to sleep in well-defined spaces and Baker is no exception. As you know, he loves to sleep in rectangular-shaped places. His owner decided to create for him a rectangular shape in her room. To do this, She knows the coordinates x,y of the objects in her room, she will tie a piece of rope to different objects she has in the room to create rectangles with the rope.



Help Baker’s owner to find the area of the biggest rectangle she can make using the objects in the room. Baker does not care if there are other things inside the rectangle, Baker can always squeeze in, as long as it is the biggest rectangle.

Input

The first line of input contains an integer T , the number of test cases. Each of the T test cases start with a line with an integer N ($4 \leq N \leq 50$), representing the number of objects in Baker’s owner room, followed by N lines, each of these lines contains two integer numbers separated by a space x_i , and y_i ($0 \leq x_i, y_i \leq 1000$). representing the i -th object is in the coordinate (x_i, y_i) of the room. Every point (x_i, y_i) is unique.

Output

For each test case print “d” (without the quotes) where d is the maximum area with 9 decimal places. If no rectangles can be formed, output -1.000000000 . Your answer value must be within 10^{-9} absolute error to be considered correct.

Sample input 1	Sample output 1
3	2.000000000
4	-1.000000000
0 0	68.000000000
1 2	
0 2	
1 0	
4	
0 0	
1 2	
0 2	
1 3	
4	
0 5	
5 2	
6 15	
11 12	