

Farm

SEASON 8 – FOURTH ROUND



Old MacDonald had a farm. In it he wanted to build a hen house. To do that that he needed to build a fence around an area where the hen house would be. He has N posts at different points in the farm and wants to have the fence connect some of them in a convex polygon such that the area of the hen house to be maximal. However, because of his superstitions MacDonald wants to use exactly K posts.

Input

From the first line of the file `space.in` two whole numbers N and K are inputted – the total number of posts and the number of posts MacDonald wants to use. From each of the following N lines two non-negative whole numbers X_i and Y_i are inputted – the coordinates of the i -th post.

Output

In the output file `space.out` print a single number – the maximal possible area of the hen house multiplied by two (so that it is a whole number). If it isn't possible to build a strictly convex polygon through K posts, print -1.

Constraints

$$1 \leq K \leq N \leq 50$$

$$0 \leq X_i, Y_i \leq 10^5$$

Time limit: 1 sec

Memory limit: 256 MB

Sample tests

Input (farm.in)	Output (farm.out)	Input (farm.in)	Output (farm.out)
5 4 0 0 0 2 1 1 1 2 2 0	6	5 4 0 0 0 1 0 2 1 1 2 1	-1

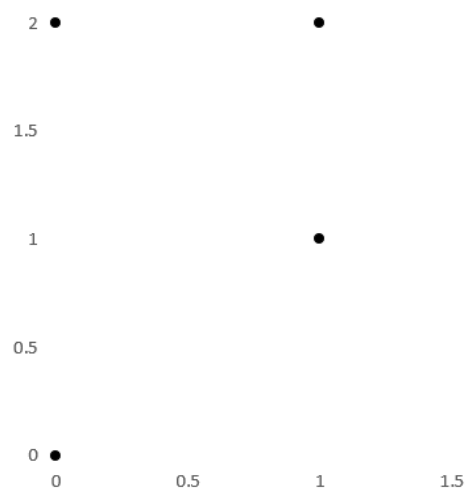
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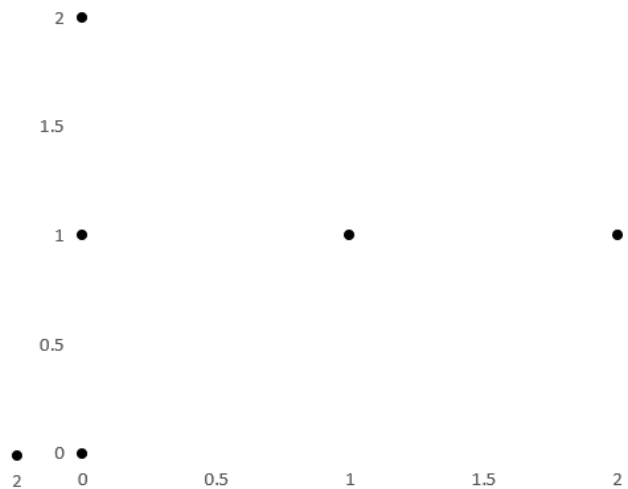


Explanation of the sample tests

Test one



Test two



In the first test, the maximal area is 3, but we need to print it multiplied by 2, so because of that we print 6.

In the second test there is no way to take four points to form a strictly convex polygon.