(Adv.) Competitive Programming

Submit until end of contest, via the judge interface

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Problem: geometry (1 second timelimit)

Note: This problem needs some heavy geometry. Solve it first! It's easy, I promise ...

Your parents bought you a nice, convex polygon for your birthday. The $3 \leq n \leq 500$ vertices are labeled from 1 to n in counter-clockwise order. Before you can eat it, however, you have to properly triangulate it. Otherwise the pieces will not fit on a spoon and your parents will be angry.

Oh boy, this task is way too easy. Let's ask the bringer of treaps for some definitions to make it more interesting. The weight of a triangle is the product of the labels of its vertices. A triangulation of a given polygon is a set of triangles such that each vertex of each triangle is a vertex of the initial polygon, there is no pair of triangles such that their intersection has non-zero area, and the total area of all triangles is equal to the area of the given polygon. For an integer $a > 1$, if a composite integer x divides $a^{x-1} - 1$, then x is called a Fermat pseudoprime to base a. The weight of a triangulation is the sum of weights of its contained triangles.

Input The first line contains the number of points n. The next n lines contain the coordinates $0 \leq x, y \leq 10^8$ of the points.

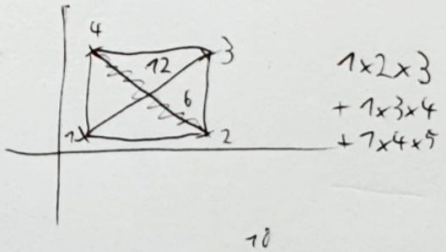
Output Compute a triangulation with minimum weight for the given convex polygon. Since I trust you, it's OK if you just print the total weight modulo $10^9 + 7$.

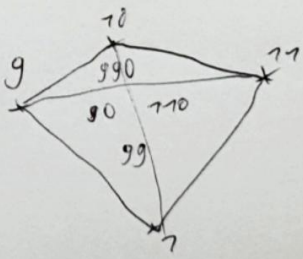
Sample input

```
4
0.25 0.25
0.75 0.25
0.75 0.75
0.25 0.75
```

Sample output

```
18
```





```
3
0 2
2 4
1 2
```

```
6
```