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Contest Code: FEB222C Problem Code: PLYARSM



You are given a **convex** polygon P with N vertices. The vertices (in clockwise order) are $v_1, v_2, \dots v_N$. The coordinates of v_i are (x_i, y_i) . All vertices have integer coordinates.

A diagonal of P is a line segment l joining two distinct vertices v_i and v_j of P, such that l is not already an edge of P. Every diagonal of P splits it into two smaller convex polygons, both having positive areas.

The evenness of a diagonal of P is the minimum of the areas of the two parts obtained when the polygon P is cut along this diagonal.

Let S be the sum of the evenness of all diagonals of P.

Find the value of $2S \pmod{998244353}$.

It can be shown that for all polygons P with integer coordinates, the value 2S is an integer.

Input Format

- The first line of input contains an integer T, denoting the number of test cases. The description of T test cases follows.
- The first line of each test case contains an integer N, the number of vertices of the convex polygon P. This is followed by N lines describing the points of the convex polygon, in **clockwise** order.
- The i^{th} subsequent line contains two space-separated **integers**, x_i, y_i the coordinates of v_i .

Output Format

For each test case, print a new line with a single integer, the answer as per the problem statement.

Constraints

- $1 \le T \le 10^5$
- $3 < N < 10^5$
- The sum of N over all test cases does not exceed $10^6\,$
- $\bullet \quad \text{ The given polygon } P \text{ is convex} \\$
- ullet Every coordinate is an integer whose absolute value does not exceed 10^8

Subtasks

Subtask #1 (5 points): Sum of ${\cal N}$ over all test cases does not exceed 500

Subtask #2 (15 points): Sum of N over all test cases does not exceed $2000\,$

Subtask #3 (80 points): Original constraints

Sample Input 1 🖆

4

4

-1 0

A 1

1 0

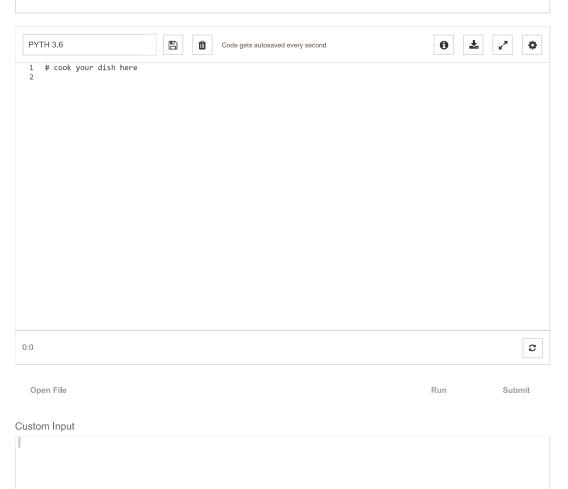
0 -1

4

-100000 0

0 100000

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100000 0
0 -100000
3
0 0
0 1
1 0
5
-87260 82619
-59348 68595
86583 -16668
85637 -45559
-49307 -31316
Sample Output 1 🖆
4
70225880
0
667956140
Explanation
Test case 1: The given polygon is a square with side length $\sqrt{2}$. There are only two diagonals, both are
identical and split the polygon equally into two halves each with area $rac{(\sqrt{2})^2}{2}=1$. Thus
$S = \min(1,1) + \min(1,1) = 2$. The value of $2S \pmod{998244353}$ is thus 4 .
Test case 2: The given polygon is identical to the previous case, except that all coordinates are multiplied by 10^5 . Therefore the given sum gets multiplied by $(10^5)^2$. Make sure you output the sum modulo 998244353 . Here $2S=4\cdot 10^{10}$ and $4\cdot 10^{10}$ (mod 998244353) = 70225880 .
Test case 3: There are no diagonals in this polygon, and so the answer is 0 .



Note: You	ur program will be run with no input.

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