

All the Way Left

Input file: **standard input**
Output file: **standard output**
Time limit: 2.5 seconds
Memory limit: 1024 megabytes

Little Drink Congee is a good friend of Little Cyan Fish and a member of the famous acting group *All the Way Left*. He has recently been practicing his ability to recognize directions on a stage. To practice, he has selected n **distinct** points $A_1, A_2, \dots, A_n$ on the stage. The stage is represented as a two-dimensional Cartesian plane, where the i -th point is located at the coordinates (x_i, y_i) . Little Drink Congee aims to travel through all these points in the order of $p_1, p_2, \dots, p_n$. A traversal is a permutation p of length n , where each point A_{p_i} is connected to $A_{p_{i+1}}$ with an oriented line segment.

Little Drink Congee thinks a traversal is considered good if and only if the following condition holds:

- It is non-self-intersecting, i.e. no two segments intersect except for two adjacent segments intersecting at one common endpoint.
- For each $1 \leq i \leq n - 2$, the i -th turn is left (or going straight). Formally, the cross product of $\overrightarrow{A_{p_i}A_{p_{i+1}}}$ and $\overrightarrow{A_{p_{i+1}}A_{p_{i+2}}}$ is non-negative.

Little Drink Congee wants to know the number of good traversals, modulo $(10^9 + 7)$. However, he needs to spend time with Little Cyan Fish and cannot solve this challenge himself. Please help him calculate it!

Input

The first line contains a single integer T ($1 \leq T \leq 10^4$), denoting the number of test cases.

For each test case, the first line contains a single integer n ($1 \leq n \leq 2 \times 10^3$).

In the next n lines, the i -th line contains two integers x_i and y_i ($1 \leq x_i, y_i \leq 10^9$), denoting the coordinates of A_i . The coordinates of all the points are distinct.

It is guaranteed that the sum of n^2 over all test cases does not exceed 4×10^6 .

Output

For each test case, output one line, containing the number of good traversals modulo $(10^9 + 7)$.

Example

standard input	standard output
3	6
4	2
1 1	13
3 1	
2 2	
2 3	
3	
1 1	
1 2	
1 3	
6	
1 1	
2 1	
2 2	
2 3	
3 2	
4 2	