# C. Counting Self-Rotating Subsets

Time limit: 1s

A set of points in the plane is *self-rotating* if there is a point **P**, *the center,* and *an angle* **α**, expressed in degrees, where 0 < **α** < 360, such that the rotation of the plane, with center **P** and angle, maps every point in the set to some point also in the set.

You are given a set of **N** distinct points, all having integer coordinates. Find the number of distinct subsets of size 1, 2, . . . ,**N** that are self-rotating. Two subsets are considered distinct if one contains a point that the other does not contain.

## Input

The first line of the input contains one integer **N** representing the number of points in the input set (1 ≤ **N** ≤ 1000). Each of the following **N** lines describes a different point of the set, and contains two integers **X** and **Y** giving its coordinates in a Cartesian coordinate system ($-10^9 \le$ **X, Y** $\le 10^9$). All points in the input set are distinct.

## Output

Output a single line containing **N** integers $\mathbf{S_1, S_2, \ldots, S_N}$. For **i** = 1, 2, . . . ,N the integer $\mathbf{S_i}$ must be the number of subsets of **i** points of the input set that are self-rotating. Since these numbers can be very big, output them modulo $10^9 + 7$.

| Input Samples | Output Samples |
|---|---|
| 3<br>1 1<br>2 2<br>1 0 | 3 3 0 |
| 7<br>-2 0<br>-1 1<br>0 2<br>0 0<br>2 0<br>1 -1<br>0 -2 | 7 21 5 5 3 1 1 |
| 1<br>-1000000000 1000000000 | 1 |

ACM/ICPC South America Contest 2016

By Pablo Ariel Heiber Argentina