

4036 Uggla Mission

According to the trusted source, scientists have found several evidences of creature's existence on a newly found planet, called *Uggla*. These evidences are distributed on k locations in a 1000×1000 square area, and the location coordinate of the i -th evidence is (x_i, y_i) . It is of our great interests to further analyze all of them so that we can have better understanding of the creatures on *Uggla*.

The Interplanetary Creature Protection Council (ICPC) has decided to initiate a mission for the exploration of *Uggla*. More specifically, the ICPC plans to launch a space shuttle to collect the evidences found on *Uggla*. However, for safety reason, the space shuttle will not land on *Uggla*, but it will launch one mobile robot to collect information of the evidences instead. Since the mobile robot is un-recyclable (i.e., they can only be landed once), it will report the space shuttle its collected data using wireless communications.

Unfortunately, after the launch of the space shuttle, a serious design fault of the mobile robot is also reported. That is *the mobile robot can only move straightly, but can not make a turn*. Since the space shuttle only carries one robot, being the captain of the space shuttle, it is now your responsibility to plan a route (i.e., where to land the robot and which direction the robot should move forward) such that the robot can visit as many locations as possible. Note that, each distinct route is a set of evidence's locations, regardless of the order of the location coordinates and the landing location of the mobile robot.

Technical Specification

1. $1 < k \leq 1000$.
2. $x_i \in N$ and $0 < x_i \leq 1000$, for $i = 1 \dots k$.
3. $y_i \in N$ and $0 < y_i \leq 1000$, for $i = 1 \dots k$.
4. $\forall i \neq j, (x_i, y_i) \neq (x_j, y_j)$, i.e., each evidence is located on a distinct coordinate.

Input

The first line of the input file contains an integer indicating the number of test cases to follow. In each test case, the first input line is an integer k indicating the number of evidences on *Uggla*, and in the following k lines, each line contains two integers, separated by one while space, indicating the x and y coordinates of each evidence of creature's existence.

Output

For each test case, output two integers, separated by one while space, in a line. The first integer is the maximum number of evidence locations that the mobile robot can visit, and the second integer is the number of distinct routes that can yield the maximum number of visited evidence locations.

Sample Input

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1
5
1 1
1 2
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1 3
2 1
2 3

Sample Output

3 1