Problem D. Christmas Holiday

Gump country consists of a number of cities, if we want to go from Kabi city to Toka city, if there is a direct route between Kabi and Toka cities, then we will take that route, and if there is no direct route between these two cities, we must Let's start in Kabi city and follow a path of citys that have a direct route to finally reach Toka city.

While we will have no limit on the number of direct routes that can intersection in a city, we guarantee that there is only one direct route between any 2 desired cities. (there can either be a direct route between two cities or not, but if there is, there is only one direct route)

Recently, a criminal group called Gumbol, which was a fan of Gump country in the past, but unfortunately, over time, due to the wrong management system, this group suffered a severe economic blow, which made them hate the country.

The Gumbol group plans to destroy one of the important and main intercity roads of the Gump country during the New Year's Eve celebration to make an important and main direct route unusable for the people of the country in order to cause the most possible damage to the Gump country because with The failure of a route is possible for people to travel to different cities during the Christmas holidays, in this case they may take longer routes for their trips, and this will decrease their satisfaction with the Gump country management system, which is the best. This could be an effective way for the Gumbol Group to cause damage to the Gump country.

An important and main way is to cut off the remaining pairs of connections between cities. You should order the construction of a new road between two desired cities to the Ministry of Roads and Urban Development, so that there is no direct route between these two cities, and as a result, by building this new direct route, the number of disconnected pairs will be reduced after You reduce the loss of critical connectivity. The critical junction is the one whose removal disconnects the most pairs of other remaining junctions in the system.

Your task is to determine which direct route should be built between the 2 cities of your choice to minimize the number of broken pairs as much as possible.

Input

The input starts with a line containing an integer N ($1 < N < 10000$), which is the number of direct routes between cities in Gump's country. Next, there are N lines in the shape of X Y, which shows that there is a direct route between X and Y city.

Direct routes are numbered consecutively starting from 0. All direct paths are two-way, and no direct path appears more than once in an entry.

There is exactly one path between any two junction points given in the input.

Output

First, print the number of pairs of connections when we have not constructed the best edge between the two cities. Then print the number of pairs of connections when we have made the best edge between the two cities. We guarantee that there will not be more than one critical connection.

Examples

test	answer
6 0 1 1 2 2 3 2 4 4 5 4 6	11 5
2 2 1 0 1	1 0