Online 1 | Topic: MST | Sec: B & C | Time: 25 minutes | Marks: 20

Your job is to establish an efficient water supply network for every residence within a city. Let us conceptualize this city as a 2D plane, where each house is positioned using coordinates. You are provided with an array, named 'houses,' representing the coordinates of houses in the city, denoted as houses[i] = [xi, yi]. The required pipe to connect two houses, [xi, yi] and [xj, yj], is determined by the Manhattan distance between them: |xi - xj| + |yi - yj|, where |val| denotes the absolute value of val.
Your objective is to calculate the minimum cost needed to connect all houses for an efficient water supply. All houses are considered connected if there exists exactly one simple path between any two houses.
Assuming all distances are measured in kilometers, the cost for purchasing each kilometer of pipe is 1 taka.

Input

The first input line contains one integer n, representing the number of houses. Following that, there are n lines describing the house positions. Each line consists of two integers, x and y, where x and y represent the two coordinates of the house position

Output

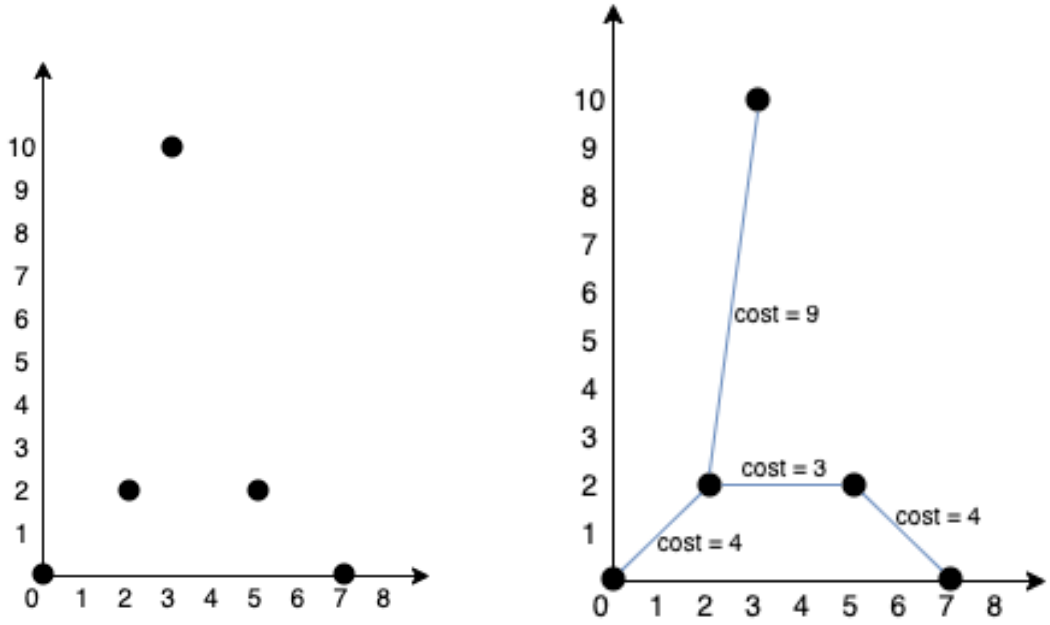
Print the minimum cost of establishing such a pipeline.

Examples:

Input	output
5 0 0 2 2 3 10 5 2	20

7 0	
3 3 12 -2 5 -4 1	18

Explanation for example 1:



We can connect the points as shown above to get the minimum cost of 20.
Notice that there is a unique path between every pair of points.