

Goal

Welcome to the year 3000. The future does not belong to you, you are an unlucky pizza delivery man. In order to deliver pizzas orders, you take the ionized compressed air transportation network of New York City. The stations of this network are points of space described by the triplet of coordinates x, y, z .

You start your run in the professor's pizzeria located in the station with the smallest y , commonly called "the end of the tube". The professor gives you a list of the stations where customers who ordered pizza are.

The stations are connected by pipes and - we are in the future - there is a direct pipe between each pair of stations. This means of locomotion can be extremely fast, but it has the disadvantage (for obvious reasons of pressure differences) of being only one way: you always move from a station i to j with a $y_i < y_j$.

You can only go back when arriving at what travelers commonly call "the other end of the tube" (the station with the largest y), where you can operate a mechanical lever to reverse the flow of air making you go in the other direction: then you always move from a station i to j with a $y_i > y_j$. And this up to your starting point located opposite the city (the station with the smallest y).

Thus two stations can not be on the same y , so that there is always enough pressure to move through the pipes.

What is the minimum distance you have to travel to get to all the stations and return to the pizzeria? To flatter your ego, you will round down to the largest integer lesser or equal than the distance you computed.

Data

Input

Row 1: an integer number N comprised between 5 and 1000, representing the total number of stations that is, the Professor's pizzeria and all the stations that have ordered a pizza .

Rows 2 to $N+1$: three integer numbers comprised between 1 and 1000 and separated by spaces representing the coordinates x, y and z of a station.

Output

The minimal distance that you need to travel to deliver all pizzas and get back to the Professor's station (rounded down to the largest integer lesser than or equal to such distance).

You can download sample input and output data files to work locally by clicking on the link at the bottom of the French version of the question



Téléchargez des fichiers d'exemple ainsi qu'un modèle de code pour travailler localement.