

8593 - LAB 11

Instructions

1. Access the auto-grader at <https://c200.luddy.indiana.edu>
2. Please write the code for the problems in python language
3. The code should be readable with variables named meaningfully
4. Plagiarism is unacceptable and we have ways to find it, so do not do it
5. Don't change the function signature (name of the function and number and types of arguments) provided in this file.
6. Once you pass all the tests on the auto grader, show your work to the teaching assistant

Problem

Question

Imagine a galaxy where a council of alien civilizations seeks to establish a network of hyper-space pathways between their planets to ensure fast and efficient travel. Each planet is represented by coordinates in a cosmic array, *points*, where each entry $points[i] = [x_i, y_i]$ denotes the fixed position of a planet in the two-dimensional expanse of space.

The cost of establishing a hyper-space pathway between any two planets is determined by the interstellar energy required, which corresponds to the Manhattan distance between the planets — that is, the sum of the absolute differences of their coordinates, calculated as $|x_i - x_j| + |y_i - y_j|$. The alien council has tasked you, the chief architect of cosmic pathways, with a critical mission: to calculate the minimum total interstellar energy required to connect all planets. The connection must be done so that every planet is linked to another directly or through a series of connections, ensuring that there is a single, unbroken route between any two planets.

Embark on this intergalactic quest to weave a web of pathways that conserves energy, fosters interplanetary alliances, and creates a network that binds the galaxy's planets in the most efficient way imaginable. Return the minimum energy required to join all the planets.

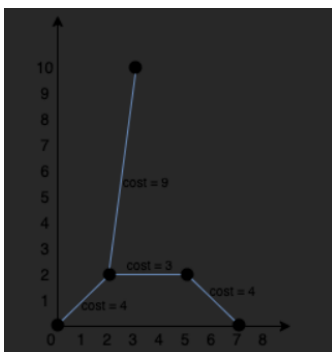
Test cases

1)

Input: $[[0,0],[2,2],[3,10],[5,2],[7,0]]$

Output: 20

Explanation:



2)

Input: $[[3,12],[-2,5],[-4,1]]$

Output: 18

Function signature

```
def minCostConnectPoints( points):  
    **your logic**  
    return int
```