



04 : 16 : 47 : 46  
DAY HRS MIN SEC

## June Circuits

LIVE

Jun 18, 2016, 09:00 PM IST - Jun 26, 2016, 09:00 PM IST

INSTRUCTIONS

PROBLEMS

SUBMISSIONS

LEADERBOARD

ANALYTICS

JUDGE

3

← Problems / Akatsuki vs Leaf

LIVE EVENTS

### Akatsuki vs Leaf

Max. Marks: 100

Akatsuki is planning to attack the Leaf Village to capture Naruto. The Hokage ( Head of the Village ), came to know about the plan and also the number of members,  $N$ , in Akatsuki who are going to attack. So, Hokage planned an ambush.



Hokage selected a team of  $N$  members ( one for each Akatsuki member ) and named it Leaf. Each member of Leaf can attack **exactly one** Akatsuki member and an Akatsuki member is **NOT** attacked by **more than one** Leaf member. In the ambush there will be  $N$  fights ( one of each  $N$  members of Leaf and  $N$  members of Akatsuki ). You are the leader of Leaf. You know the positions ( x-coordinates and y-coordinates ) of all the Akatsuki members and Leaf members. Your task is to **assign each member of Leaf to exactly one member of Akatsuki team such that the sum of the distance between them is minimum**. Distance between two points  $(x_1, y_1)$  and  $(x_2, y_2)$  will be equal to  $|x_1 - x_2| + |y_1 - y_2|$ .

Input:

First line contains one integer  $N$ , number of **Akatsuki** members who are going to attack the village. Next  $N$  lines will contain two integers each,  $X$  and  $Y$ , x-coordinate and y-coordinate of the **Akatsuki** members.

Next  $N$  lines will contain two integers each,  $X$  and  $Y$ , x-coordinate and y-coordinate of the **Leaf** members.



#### Output:



Print the **required minimum sum** of the distance.

#### Constraints:

$$1 \leq N \leq 20$$

$$-10^6 \leq X, Y \leq 10^6$$

SAMPLE INPUT	 
2 0 0 8 8 1 1 6 6	

SAMPLE OUTPUT	 
6	

#### Explanation

$$N = 2$$

So there are 2 **Akatsuki** members at position  $(0, 0)$  and  $(8, 8)$  and 2 **Leaf** members at position  $(1, 1)$  and  $(6, 6)$ . There are 2 cases:

##### Case 1:

Leaf member at  $(1, 1)$  will fight Akatsuki member at  $(0, 0)$  and Leaf member at  $(6, 6)$  will fight Akatsuki member at  $(8, 8)$ .

$$\text{Sum of distances} = ((|1 - 0| + |1 - 0|) + (|6 - 8| + |6 - 8|)) = (2 + 4) = 6$$

##### Case 2:

Leaf member at  $(1, 1)$  will fight Akatsuki member at  $(8, 8)$  and Leaf member at  $(6, 6)$  will fight Akatsuki member at  $(0, 0)$ .

$$\text{Sum of distances} = ((|1 - 8| + |1 - 8|) + (|6 - 0| + |6 - 0|)) = (14 + 12) = 26$$

So Case 1 is optimal and minimum sum of distances is 6.

<b>Time Limit:</b>	1.0 sec(s) for each input file.
<b>Memory Limit:</b>	256 MB
<b>Source Limit:</b>	1024 KB
<b>Marking Scheme:</b>	Marks are awarded if any testcase passes.
<b>Allowed Languages:</b>	C, CPP, CLOJURE, CSHARP, D, ERLANG, FSHARP, GO, GROOVY, HASKELL, JAVA, JAVA8, JAVASCRIPT, JAVASCRIPT_NODE, LISP, LISP_SBCL, LUA, OBJECTIVEC, OCAML, OCTAVE, PASCAL, PERL, PHP,

## CODE EDITOR

☺ Our compiler wanted to be here!

But the mobile is too cramped for it to load. It says it would be more comfortable on the web.

Your Rating:   Like   Share   1   Tweet

---

### ABOUT US

[Blog](#)  
[Engineering Blog](#)  
[Updates & Releases](#)  
[Team](#)  
[Careers](#)  
[In the Press](#)

### HACKEREARTH

[API](#)  
[Chrome Extension](#)  
[CodeTable](#)  
[HackerEarth Academy](#)  
[Developer Profile](#)  
[Resume](#)  
[Get Badges](#)  
[Campus Ambassadors](#)  
[Get Me Hired](#)  
[Privacy](#)  
[Terms of Service](#)

### DEVELOPERS

[AMA](#)  
[Code Monk](#)  
[Judge Environment](#)  
[Solution Guide](#)  
[Problem Setter Guide](#)  
[Practice Problems](#)  
[HackerEarth Challenges](#)  
[College Challenges](#)  
[College Ranking](#)  
[Organise Hackathon](#)  
[Hackathon Handbook](#)  
[Competitive Programming](#)  
[Open Source](#)

### EMPLOYERS

[Developer Sourcing](#)  
[Lateral Hiring](#)  
[Campus Hiring](#)  
[Hackathons](#)  
[FAQs](#)  
[Customers](#)

### REACH US



Ground Floor, Salarpuria Business Center,  
4th B Cross Road, 5th A Block,  
Koramangala Industrial Layout,

Bangalore, Karnataka 560095, India.

✉ [contact@hackerearth.com](mailto:contact@hackerearth.com)

☎ +91-80-4155-4695

☎ +1-650-461-4192



© 2016 HackerEarth