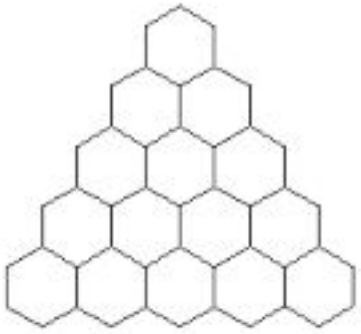
Task 15: **Hexagonal Doom Trap**

[550 points]



Luke has been caught in a Hexagonal Doom Trap. He needs your help to find the fastest way out of the maze. The Hexagonal Doom Trap is depicted by the picture to the right; each module (hexagon) is connected to at least two other modules and at most six other modules. Luke has six total moves available to him – 4 of these possible connections are diagonal: up left, up right, down left, and down right, while the other 2 are simply left and right.

Luke is currently located at the top of the Doom Trap structure. He needs to leave as fast as he can to fight Stormtroopers, but one of his lightsabers is in the bottom right corner of the trap, while the other one is in the bottom left corner. Luke needs both of his lightsabers, and he needs to do it as quickly as possible. Since the exit is just above the top of the Hexagonal Doom Trap, Luke needs help to find the fastest route from the top of the Trap to the bottom right, then to the bottom left, and back to the top again.

Since this is a trap, there are numerous obstacles located in each module of the structure. Therefore, traversing each module will take a different amount of time based on the number of obstacles.

Problem Statement

Given the time that it takes to traverse every module of the Hexagonal Doom Trap, output the minimum amount of time that it would take Luke to get from his current position (top of the Trap), to the bottom right (where one of his lightsabers is), to the bottom left (where the other lightsaber is) and finally to the exit (back to the top of the Trap).

Input Format

The first line contains the integer, `N`, denoting the number of rows in the Hexagonal Doom Trap. Assume that the minimum number of rows is 3. The next `N` lines will contain a comma delimited list of positive integers, denoting the amount of time that it takes to get through a respective

modules. The first line will have one integer, and the second line will have two integers, so on and so forth.

Output Format

Output an integer denoting the minimum time required to get both of Luke's lightsabers and exit the Doom Trap.

Sample Input

```
5
5
1,3
1,2,4
2,4,3,1
6,8,3,7,9
```

Sample Output

```
40
```

Sample Test Case Explanation

In the test case above, Luke starts at the top of the Hexagonal Doom Trap. He moves down left (1), down right (2), down right (3), right (1), and down right (9). He is now in the bottom right and have spent 16 time units getting there. Now he moves up left (1), left (3), up left (2), left (1), down left (2), and down left (6). Getting to the bottom left cost him 15 more time units. Finally, he moves up right (2), up right (1), up right (1), and up right (5). Getting to the top costs him 9 more time units for a grand total of 40 time units spent on the trip.