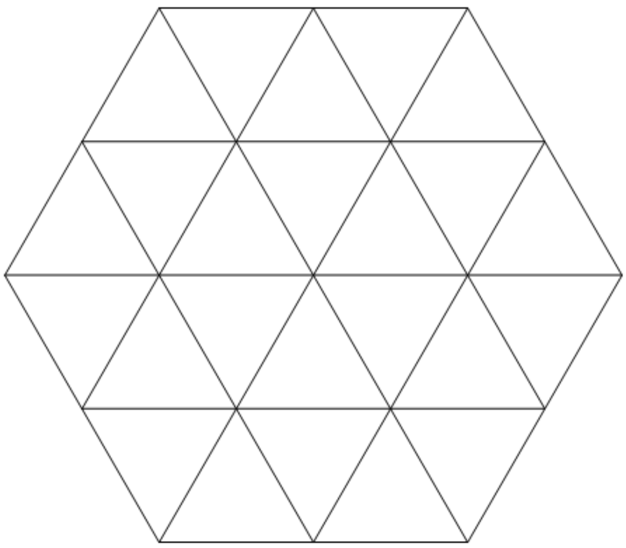
Hexagonal Tiling

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	1024 mebibytes

You are given a regular hexagon having sides of length N. A regular hexagon can be split into unit equilateral triangles of side length 1 as shown in the figure below. We are going to completely fill the hexagon with unit rhombuses of side length 1 formed by joining two equilateral triangles which share an edge.



Hexagon formed from triangles

For each position a unit rhombus can be placed, the cost of placing a rhombus is given. Find the minimum cost required to fill the hexagon.

Input

The first line of input contains N.

The following $2N$ lines contain the cost for a rhombus placed in each respective row.

Let's say the cost of a rhombus formed by joining the j-th and $j+1$-th triangles of the i-th row is $p_{i,j}$.

The i-th of the $2N$ lines of input contains $p_{i,1}, p_{i,2}, \ldots$.

The next $2N-1$ lines of input contain the cost for a rhombus placed across two rows.

Let's say the cost of a rhombus formed by joining the j-th inverted triangle of the i-th row and the triangle above it is $q_{i,j}$.

The i-th of the $2N-1$ lines contains $q_{i+1,1}, q_{i+1,2}, \ldots$.

Output

Print the minimum cost required to fill the hexagon using unit rhombuses. It can be proved that it is always possible to fill a hexagon using unit rhombuses.

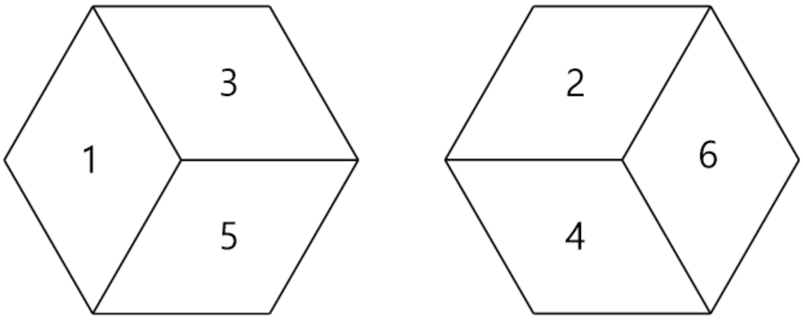
Scoring

- $1 \le N \le 100$
- $0 \le p_{i,j}, q_{i,j} \le 10^9$

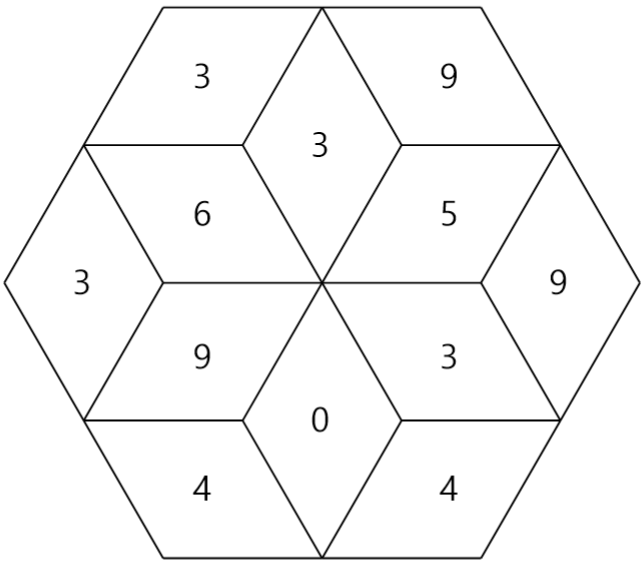
Examples

standard input	standard output
1 2 3 4 5 1 6	9
2 3 14 15 9 2 6 5 3 5 8 97 9 3 2 3 8 4 6 26 4 3 3 8 3 2 7 9 5 0 2	58

Note



The costs of rhombuses given in example 1



The solution for example 2