B Journey

Time limit: 2.0s
Memory limit: 256MB

Chances are that you have probably already heard of the travelling salesman problem. If you have, then you are aware that it is an NP-hard problem because it lacks an efficient solution. Well, this task is an uncommon version of the famous problem! Its uncommonness derives from the fact that this version is, actually, solvable.

In this case, Shah Abbas, the great ruler of Isfahan, is the traveller on a mission to visit n places in Isfahan, each exactly once. These places are represented by numbers $1, 2, \ldots, n$. What we know is the direct travel duration between each pair of places. Shah Abbas, known for his efficiency and love for order, wants to modify the visiting sequence so that the total travel duration is the minimum possible.

However, the task is complicated further by a peculiar condition from Shah Abbas himself. He has decreed that for each place labeled k, it must apply: either all places with labels smaller than k have been visited before the place labeled k, or they will all be visited after the place labeled k. In other words, the situation when one of these places is visited before and the other after is not allowed.

Assist the great Shah Abbas in his ambitious mission and calculate the minimum total travel duration needed in order to visit all the places, starting from whichever place and ending in whichever place, visiting each place exactly once, while adhering to Shah Abbas' peculiar request.

Input

The first line of input contains the positive integer n ($2 \leq n \leq 1500$) — the number of places in Isfahan.

Each of the following n lines contains n positive integers from the interval $[0, 1000]$. The number in the bth place in the ath row represents the travel duration between places a and b. That number is equal to the ath number in the bth row. When $a = b$, that number is 0. Otherwise, it is a positive value.

Output

The first and only line of output must contain the required minimum total travel duration.

Samples

Sample input 1	Sample output 1
3 0 5 1 5 0 4 1 4 0	6

Sample input 2	Sample output 2
4 0 15 7 8 15 0 16 9 7 16 0 11 8 9 11 0	31