Watering hole

Farmer John has decided to bring water to his N pastures which are conveniently numbered $1, \ldots, N$. He may bring water to a pasture either by building a well in that pasture or connecting the pasture via a pipe to another pasture which already has water.

Digging a well in pasture i costs W_i. Connecting pastures i and j with a pipe costs $P_{i,j}$.

Determine the minimum amount Farmer John will have to pay to water all of his pastures.

Input

The first line contains a single integer N ($1 \leq N \leq 300$). N lines follow, the i-th of them contains a single integer W_i ($1 \leq W_i \leq 100\,000$). Another N lines follow, the i-th of them contains N space-separated integers, the j-th of them being $P_{i,j}$ ($1 \leq P_{i,j} \leq 100\,000, P_{i,j} = P_{j,i}, P_{i,i} = 0$).

Output

Output a single line with a single integer that is the minimum cost of providing all the pastures with water.

Example

vstup

```
4
5
4
4
3
0 2 2 2
2 0 3 3
2 3 0 4
2 3 4 0
```

výstup

```
9
```

Farmer John may build a well in the fourth pasture and connect each pasture to the first, which costs $3 + 2 + 2 + 2 = 9$.