Watering Hole

Paul Christiano, 2007
Points: 400

Farmer John has decided to bring water to his N (1 <= N <= 300) pastures which are conveniently numbered 1..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 (1 <= W_i <= 100,000). Connecting pastures i and j with a pipe costs P_ij (1 <= P_ij <= 100,000; P_ij = P_ji; P_ii=0).

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

Input

- Line 1: A single integer: N
- Lines 2..N + 1: Line i+1 contains a single integer: W_i
- Lines N+2..2N+1: Line N+1+i contains N space-separated integers; the j-th integer is P_ij

Output

- Line 1: A single line with a single integer that is the minimum cost of providing all the pastures with water.

Example

Input:
```
4
5
4
4
3
0 2 2 2
2 0 3 3
2 3 0 4
2 3 4 0
```

Output:
```
9
```

Input details

There are four pastures. It costs 5 to build a well in pasture 1, 4 in pastures 2 and 3, 3 in pasture 4. Pipes cost 2, 3, and 4 depending on which pastures they connect.

Output details

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