Contest Duration: 2019-07-21(Sun) 20:00 (http://www.timeanddate.com/worldclock/fixedtime.html?iso=20190721T2100&p1=248) ~ 2019-07-21(Sun) 22:40 (http://www.timeanddate.com/worldclock/fixedtime.html?iso=20190721T2340&p1=248) (local time) (160 minutes) Back to Home (/home)

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D - Negative Cycle

Editorial (/contests/agc036/tasks/agc036_d/editorial)

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Time Limit: 2 sec / Memory Limit: 1024 MB

Score : 1200 points

Problem Statement

We have a weighted directed graph with N vertices numbered 0 to $N-1$.

The graph initially has $N-1$ edges. The i-th edge ($0 \leq i \leq N-2$) is directed from Vertex i to Vertex $i+1$ and has a weight of 0.

Snuke will now add a new edge $(i \to j)$ for every pair i, j ($0 \leq i, j \leq N-1,\ i \neq j$). The weight of the edge will be -1 if $i < j$, and 1 otherwise.

Ringo is a boy. A negative cycle (a cycle whose total weight is negative) in a graph makes him sad. He will delete some of the edges added by Snuke so that the graph will no longer contain a negative cycle. The cost of deleting the edge $(i \to j)$ is $A_{i,j}$. He cannot delete edges that have been present from the beginning.

Find the minimum total cost required to achieve Ringo's objective.

Constraints

- $3 \leq N \leq 500$
- $1 \leq A_{i,j} \leq 10^9$
- All values in input are integers.

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Input

Input is given from Standard Input in the following format:

$$
\begin{array}{l}
N \\
A_{0,1} \ A_{0,2} \ A_{0,3} \ \cdots \ A_{0,N-1} \\
A_{1,0} \ A_{1,2} \ A_{1,3} \ \cdots \ A_{1,N-1} \\
A_{2,0} \ A_{2,1} \ A_{2,3} \ \cdots \ A_{2,N-1} \\
\vdots \\
A_{N-1,0} \ A_{N-1,1} \ A_{N-1,2} \ \cdots \ A_{N-1,N-2}
\end{array}
$$

Output

Print the minimum total cost required to achieve Ringo's objective.

Sample Input 1 Copy

Copy

```
3
2 1
1 4
3 3
```

Sample Output 1 Copy

Copy

```
2
```

If we delete the edge $(0 \to 1)$ added by Snuke, the graph will no longer contain a negative cycle. The cost will be 2 in this case, which is the minimum possible.

Sample Input 2 Copy

Copy

```
4
1 1 1
1 1 1
1 1 1
1 1 1
```

Sample Output 2 Copy

Copy

```
2
```

If we delete the edges $(1 \to 2)$ and $(3 \to 0)$ added by Snuke, the graph will no longer contain a negative cycle. The cost will be $1 + 1 = 2$ in this case, which is the minimum possible.

Sample Input 3 Copy

Copy

```
10
190587 2038070 142162180 88207341 215145790 38 2 5 20
32047998 21426 4177178 52 734621629 2596 102224223 5 1864
41 481241221 1518272 51 772 146 8805349 3243297 449
918151 126080576 5186563 46354 6646 491776 5750138 2897 161
3656 7551068 2919714 43035419 495 3408 26 3317 2698
455357 3 12 1857 5459 7870 4123856 2402 258
3 25700 16191 102120 971821039 52375 40449 20548149 16186673
2 16 130300357 18 6574485 29175 179 1693 2681
99 833 131 2 414045824 57357 56 302669472 95
8408 7 1266941 60620177 129747 41382505 38966 187 5151064
```

Sample Output 3 Copy

Copy

```
2280211
```


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