Problem F. Fallensquare

Time limit: 1.5 seconds
Memory limit: 1024 mebibytes

A tiger has escaped from RUN Zoo! To subdue it, the zookeeper Nubzuki plans to drop part of a special cube onto the tiger.

The cube has an $N \times N$ square cross-section, represented on a coordinate plane by the square with lower-left corner $(0, 0)$ and upper-right corner (N, N). The x-coordinate increases to the right, and the y-coordinate increases upward. A bomb is placed at each of the N^2 lattice points (i, j) with $0 \le i < N$, $1 \le j \le N$. The bomb at (i, j) has attack power $A_{i,j}$. An attack power may be negative, in which case it reduces the total damage dealt.

To release part of the cube, the zookeeper must make exactly one straight cut using a laser. Due to technical limitations, the cutting line must have the form $y = mx + k$, where m is a non-positive integer, that is, $m \le 0$. In addition, k must be an integer satisfying $0 \le k \le N$. Thus, the cutting line intersects the left edge of the square, including either endpoint of that edge.

Only the part of the cube on or below the cutting line falls onto the tiger. Thus, the bomb at (i, j) contributes to the damage if and only if $j \le mi + k$. Bombs lying exactly on the cutting line are also included. The total damage is the sum of the attack powers of all included bombs.

Find the maximum possible total damage that RUN Zoo can deal by choosing a valid cutting line.

Input

The first line contains an integer N.

The next N lines describe the bombs as seen on the coordinate plane, from top to bottom and from left to right. The r-th of these lines contains N integers $A_{0,N-r+1}, A_{1,N-r+1}, \ldots, A_{N-1,N-r+1}$. In other words, the c-th integer on the r-th line is the attack power of the bomb at $(c - 1, N - r + 1)$.

Output

Print an integer — the maximum total damage that can be dealt by choosing a valid cutting line.

Constraints

- $1 \le N \le 1\,500$
- $-10^9 \le A_{i,j} \le 10^9$ $(0 \le i < N, 1 \le j \le N)$

Examples

standard input	standard output
3 -100 -100 -100 -1 10 -100 5 7 -100	11
1 -5	0
2 1000000000 1000000000 1000000000 1000000000	4000000000

Note

In the first example, choosing $m = -1$ and $k = 2$ includes the bombs at $(0, 1)$, $(0, 2)$, and $(1, 1)$, dealing $5 + (-1) + 7 = 11$ damage. Although this cut includes a bomb with negative attack power, no valid cutting line deals more damage.

In the second example, choosing $m = 0$ and $k = 0$ includes no bombs, so the maximum damage is 0.

In the third example, choosing $m = 0$ and $k = 2$ includes all four bombs, dealing $4 \cdot 10^9$ damage.