

A problem that is simple to solve in one dimension is often much more difficult to solve in more than one dimension. Consider satisfying a boolean expression in conjunctive normal form in which each conjunct consists of exactly 3 disjuncts. This problem (3-SAT) is NP-complete. The problem 2-SAT is solved quite efficiently, however. In contrast, some problems belong to the same complexity class regardless of the dimensionality of the problem.

Given a 2-dimensional array of positive and negative integers, find the sub-rectangle with the largest sum. The sum of a rectangle is the sum of all the elements in that rectangle. In this problem the sub-rectangle with the largest sum is referred to as the *maximal sub-rectangle*.

A sub-rectangle is any contiguous sub-array of size 1×1 or greater located within the whole array. As an example, the maximal sub-rectangle of the array:

0	-2	-7	0
9	2	-6	2
-4	1	-4	1
-1	8	0	-2

is in the lower-left-hand corner:

9	2
-4	1
-1	8

and has the sum of 15.

Input

The input consists of an $N \times N$ array of integers.

The input begins with a single positive integer N on a line by itself indicating the size of the square two dimensional array. This is followed by N^2 integers separated by white-space (newlines and spaces). These N^2 integers make up the array in row-major order (i.e., all numbers on the first row, left-to-right, then all numbers on the second row, left-to-right, etc.). N may be as large as 100. The numbers in the array will be in the range $[-127, 127]$.

Output

The output is the sum of the maximal sub-rectangle.

Sample Input

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4
0 -2 -7 0 9 2 -6 2
-4 1 -4 1 -1
8 0 -2
```

Sample Output

15