B7 – Triangle path maximum sum

Consider the following triangular matrix of numbers:

$$
\begin{array}{ccccccc}
\underline{5} & & & & & & \\
\underline{6} & 2 & & & & & \\
0 & \underline{3} & 8 & & & & \\
4 & \underline{9} & 5 & 1 & & & \\
8 & \underline{4} & 0 & 4 & 2 & & \\
1 & 0 & \underline{5} & 7 & 4 & 0 & \\
9 & 4 & 2 & \underline{5} & 0 & 3 & 7 \\
\end{array}
$$

A path through the matrix includes exactly one element from each row. For two elements from adjacent rows to be in the same path requires that one element be either directly below the other, or else below it and one place to the right. In other words, in traversing a path from the top row to the bottom, at each step you must move either to the element directly below or to that element's immediate right neighbor. The sum of a path is simply the sum of the elements in that path. In the 7-row matrix depicted above, the sum of the path whose elements are underlined is 37, which is the maximum of the sums of all 64 paths.

Develop a program that, given a triangular matrix, computes the maximum of the sums of all the paths through it.

Input:

The first line of the input contains a positive integer $m \leqslant 40$. The matrix is described on the following m lines, and each of the next m lines contains the elements of one row of the matrix. For i satisfying $1 \leqslant i \leqslant m$, the i-th row contains exactly i integers, separated by one or more spaces.

Output:

Output the maximum of the sums of all the paths through the matrix.

Input and output samples:

Input:
7
5
6 2
0 3 8
4 9 5 1
8 4 0 4 2
1 0 5 7 4 0
9 4 2 5 0 3 7

Output:
37

Input:
8
3
5 -2
-3 4 8
7 2 -1 5
2 9 14 -2 17
10 -3 8 6 2 -2
8 -2 5 7 13 -9 -5
-5 0 3 6 -2 5 9 13

Output:
52