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Algorithms Lab

Exercise – *Bonus Level*

You have played Super Mario Bros.™ thousands of times and think that you know every little detail of the game. However, while playing it again out of boredom, you jumped at a particular moment and place and suddenly you are transported to a secret bonus level you had never seen before!

You find yourself (your Mario character to be precise) on a level consisting of a $n \times n$ grid of shelves. Mario is standing on the top left shelf and Princess Toadstool is on the bottom right one. Your task is to get to the Princess to save her and then return back to the top left shelf. The rules of the bonus level are a bit different to the standard rules in Mario's world. While going towards the Princess, Mario can only jump to the shelf below him or to the shelf to the right (if there is one). On the return journey, Mario and the Princess can only jump to the shelf above or to their left. Since this is a bonus level, along the way you can collect extra points. Each shelf contains a number of coins and Mario's goal is to collect as many coins as he can during his rescue mission. You want to know what is the largest number of coins he can collect.

Input The first line of the input contains the number $1 \leq t \leq 30$ of test cases. Each of the t test cases is described as follows.

- It starts with a line that contains one integer `n` ($1 \leq n \leq 150$), denoting the number of shelves in each row and column.
- The following n lines contain n integers each. In the i-th line there are integers $\texttt{a}_{i,1}, \ldots, \texttt{a}_{i,n}$ ($0 \leq a_{i,j} \leq 100$), separated by a space. Each $a_{i,j}$ denotes the number of coins on the i-th row and j-th column of shelves, counting rows from the top and columns from the left. Thus, the top left shelf contains $a_{1,1}$ and the bottom right $a_{n,n}$ many coins.

Output For every test case the corresponding output appears on a separate line. It consists of one integer, the maximal number of coins Mario can collect by going from his top left shelf to the bottom right shelf and back, while following the rules of moving from shelf to shelf.

Points There are three groups of test sets, worth 100 points in total.

1. For the first group of test sets, worth 30 points, you may assume that $n \leq 6$.
2. For the second group of test sets, worth 50 points, you may assume that $n \leq 30$.
3. For the third group of test sets, worth 20 points, there are no additional assumptions.

Corresponding sample test sets are contained in `test`i`.in/out`, for $i \in \{1, 2, 3\}$.

Sample Input

```
2
4
0 5 0 10
5 5 0 0
1 0 0 0
0 0 0 1
3
2 1 0
2 2 0
1 2 0
```

Sample Output

```
26
10
```