



Problem 13: Plinko Plus¹

Source filename: `plinko.(cpp|java)`
 Input filename: `plinko.in`
 Output filename: `plinko.out`

Plinko has proven to be a favorite game of contestants on the “Price is Right” TV show. In the TV show version, contestants drop a token through a series of pegs hoping it will land in the \$10,000 bin at the bottom of the rectangular array of pegs.

The pegs for this problem are arranged in a triangle and every peg has a value; and rather than hoping that the token lands in the largest value at the bottom of the triangle, you are searching for the maximum sum of values that could result as a token falls through the triangular grid of pegs scoring the value associated with each peg it hits along the way.

Objective

Write a program that reads input from a file named **plinko.in** that contains one or more test cases and reports the maximum sum of numbers passed as the token **starts at the top and ends somewhere on the base of the triangle**. Each step can go either diagonally down to the left or diagonally down to the right one position. For example, in the example triangle shown below, the token that travels from 7 to 3 to 8 to 7 ending up at 5 produces the maximum sum of 30.

```

      7
     3 8
    8 1 0
   2 7 4 4
  4 5 2 6 5
  
```

Be careful! A poor choice in algorithms may cause your program to exceed the time limit.

Input File Specification (**plinko.in**)

The input file contains 1 or more test cases. The end of the file is marked by a line that contains a single zero.

The first line of each test case contains a single integer, n ($0 < n < 100$), that represents the number of rows in the triangle to follow. The next n lines contain the integers for each of the n rows of the triangle. The i^{th} such line ($1 \leq i \leq n$) which represents the i^{th} row of the triangle contains i integers. Rather than attempt to preserve the formatting shown in the example triangle above, the input file has no leading or trailing spaces and only a single space between the integers. For example, a test case that corresponds to the example shown above would appear as:

```

5
7
3 8
8 1 0
2 7 4 4
4 5 2 6 5
  
```

Each integer in the triangle is a number between 0 and 999, inclusive.

Output Specification (**plinko.out**)

For each test case, output the value of the maximum sum found by traversing the triangle from the top to the bottom.

<u>Example Input File</u>	<u>Corresponding Output</u>
5	30
7	1000
3 8	
8 1 0	
2 7 4 4	
4 5 2 6 5	
3	
1	
998 0	
0 0 999	
0	

¹ This problem appeared at the CCSC:MidSouth Student Programming Contest April 3, 2009.