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HS 2014
Exercise Sheet ACM Week III

Algorithms Lab

Exercise 3 – *Burning Coins from Two Sides*

A friend of yours who recently sold his internet startup for several million dollars wants to share parts of his money with you. The catch is that he will not just give it to you but that he wants to play a game that will determine how much you actually get. The game works as described below.

There are n coins lined up in a row ($0 \leq n \leq 1000$). Each coin has a specific, known value $0 < v_i \leq 1000$. The game is played in turns and you are the one to start. Every time it is your turn you can either take the first or last coin in the row. Once you took the coin of your choice your friend will do the same (also either take the now first or last coin in the row), and this procedure will be iterated till someone has taken the last coin. The money you get at the end is the sum of the values of the coins you have collected while playing this simple game.

For a given row of coins $c_1, c_2, \ldots, c_n$ with corresponding values $v_1, v_2, \ldots, v_n$ we want to know how much money you are guaranteed to win if you manage to play optimally. (Independent of the strategy of your friend.)

Input The first line contains c, the number of testcases following. Each testcase consists of a single line containing $n + 1$ integers. The first integer is n, the number of coins used for the game, followed by n integers representing the individual coin values $v_1, v_2, \ldots, v_n$.

Output After analyzing the game simply print w_{min}, the amount you are guaranteed to win if both players play an optimal strategy, on a line of its own. Remember that you start taking the first coin.

Sample Input

```
2
3 3 1 2
4 1 4 9 4
```

Sample Output

```
4
10
```

(100 Points)