Deadline: 15-FEB, 11:59pm

## Solving the Max Subarray Problem via Divide-and-conquer

**Description** In this lab assignment, your job is to implement the  $O(n \log n)$  time divideand-conquer algorithm for the Max Subarray Problem; for the pseudo-code, see page 72 in the textbook or the lecture slides. Recall that in the problem, we are given as input an array  $A[1 \cdots n]$ of n integers, and would like to find  $i^*$  and  $j^*$   $(1 \le i^* \le j^* \le n)$  such that  $A[i^*] + A[i^* + 1] +$  $\cdots + A[j^*]$  is maximized.

**Input structure** The input starts with an integer number n, which indicates the array size. Then, the integers,  $A[1], A[2], \dots, A[n]$ , follow, one per line.

**Output structure** Output the sum of integers in the max subarray, i.e.,  $A[i^*] + A[i^* + 1] + \cdots + A[j^*]$ .

## Examples of input and output:

Input

6

-3

11

-2 -3

. .

10

-5

Output

16

Note that in this example, the max subarray is  $A[2\cdots 5]$ . So, we output  $A[i^*] + \cdots + A[j^*] = 11 - 2 - 3 + 10 = 16$ . The output is only one number and has no white space.

See the lab guidelines for submission/grading, etc., which can be found in Files/Labs.