

**Today** Divide and Conquer; recurrences. §§ 4.{1,2,3}.

**Next class** Elementary Graph Algorithms. §§ 22.\*.

1. Write your name below.
  
2. Trace the execution of the FIND-MAX-CROSSING-SUBARRAY algorithm on the array **A** depicted below, with the arguments **low**, **mid**, and **high** equal to 1, 5, and 10, respectively.

i:	1	2	3	4	5	6	7	8	9	10
A[i]:	88	19	9	-66	-2	116	-56	-12	87	101

List the values of *sum* and *left-sum* after each iteration of the first for-loop of the algorithm. Similarly, list the values of *sum* and *right-sum* after each iteration of the second for-loop.

3. Depict the recursion tree that outlines the recursive calls made by the FIND-MAXIMUM-SUBARRAY algorithm when invoked on the array of Question 2 (repeated below), with `low` and `high` equal to 1 and 10, respectively. The nodes of the tree should be labeled with the function invoked (FIND-MAXIMUM-SUBARRAY or FIND-MAX-CROSSING-SUBARRAY and the edges should connect each function's node to the node of its invoker.

i:	1	2	3	4	5	6	7	8	9	10
A[i]:	88	19	9	-66	-2	116	-56	-12	87	101

4. Provide an asymptotic solution (big  $\Theta$ ) for the following recurrence. Explain briefly.

$$S(n) = n^2 - n + S(n - 2)$$