Supplementary Assignments for Function and Algorithm Sections

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1. a. Describe in detail the steps of an algorithm (in pseudocode) that finds the maximum and minimum of a sequence of n elements by examining pairs of successive elements, keeping track of a temporary maximum and a temporary minimum. If n is odd, both the temporary maximum and temporary minimum should initially equal the first item, and if n is even, the temporary minimum and temporary maximum should be found by comparing the initial two elements. The temporary maximum and temporary minimum should be updated by comparing them with the maximum and minimum of the pair of elements being examined.

   b. How many comparisons of elements of the sequence are carried out by this algorithm? (Do not count comparisons used to determine whether the end of the sequence has been reached.)

   c. Express the complexity in Big-O notation.

2. Devise a efficient algorithm for finding the second largest element in a sequence of n elements:

a). Describe the steps of your algorithm, and express the algorithm in pseudocode.

b). Determine the worst-case complexity of your algorithm (i.e. number of operations).