Written Assignment III  
COP3502H  

Due: Wednesday, 4/11/07 in class  

Make sure you show all you work and start early.

From “Data Structures, Algorithms, and Software Principles in C”

1. page 547, #1,2  
2. page 551, #1  
3. page 571, #1

Also do this problem:

Professors Howard, Fine, and Howard have proposed the following sorting algorithm:

STOOGESORT(A,i,j)  

    if A[i] > A[j]  
        swap (A[i], A[j]);  
    if i+1 ≥ j  
        return;  
    k = ⌊(j-i+1)/3⌋;     // round down  
    STOOGESORT(A,i,j-k);   // first two-thirds  
    STOOGESORT(A,i+k,j);   // last two-thirds  
    STOOGESORT(A,i,j-k);   // first two thirds again  

a). Argue that STOOGESORT(A,1, length[A]) correctly sorts the input array A[1..n], where n=length[A].

b). Give a recurrence for the worst-case running time of STOOGESORT. Solve the recurrence relation and find the running time using Big-O notation.

c). Compare the worst case running time of STOOGESORT with that of insertion sort, merge sort, bubble sort, and quicksort. Doe the professors deserve tenure?