Data Structures: Homework 5

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1) $T(n) = T(9n/10) + n$ $\quad a=1,\ b=10$ $\xrightarrow{\text{Case 1}}$ $\Theta(n)$

$T(n) = 7T(n/2) + n^2$ $\quad a=7\ \ b=2\ \ d=2$ $\xrightarrow{\text{Case 3}}$ $\Theta(n^{\log_2 7})$

$T(n) = 2T(n/4) + n^{1/2}$ $\quad a=2\ \ b=4\ \ d=1/2$ $\xrightarrow{\text{Case 2}}$ $\Theta(n^{1/2}\log n)$

Large Element

2) if $l = r$
return l

else
mid = $\frac{l+r}{2}$

A[1] ← Large Element (A[1mid])
A[2] ← Large Elements (A[1mid+1])
if A[1] > A[2]
return A[1]
else
return A[2]

Outputs largest Element at the farthest left

$C(n) = n-1$

The Algorithm = brute force Comparisons

3) If all elements are equal, the array is already sorted so Best Case [logic]

If all elements decreasing, the array will become two arrays of n and n-1, Worst Case

4) pre order - a, b, d, e, c, f

in order - d, b, e, a, c, f

Post order - d, e, b, f, c, a