Lecture 26: Analyzing Divide and Conquer Algorithms

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MergeSort(A[1 .. u])
if n > 1
    m = ⌊(u-l)/2⌋
    MergeSort(A[l .. m])
    MergeSort(A[m+1 .. u])
    Merge(A[l .. u], m)

Merge(A[l .. u], m)
i = l; j = m+1
for k = 1 to u
    if j > u
        B[k] = A[i]; i = i+1
    else if i > m
        B[k] = A[j]; j = j+1
    else if A[i] < A[j]
        B[k] = A[i]; i = i+1
    else
        B[k] = A[j]; j = j+1
    for k = l to u
        A[k] = B[k]

Problem 1. What is the running time of the above algorithm?
Problem 2. What is the running time of the above algorithm?

Problem 3. Suppose the running of an algorithm is given by $T(1) = 1$ and

$$T(n) = T(3n/4) + T(n/4) + n$$