

CS 3343 (Fall 2007) Assignment 2

Time Analysis

Due: 11th September. (Tuesday)

Excuse: 13th September. (Thursday)

1. Exercise 2.3 Question 6 (a - d).
2. Consider the following recursive algorithm where A is an array of positive numbers, i and j are indices to the left and right boundary of the input.

Mystery(A, i, j)

1. **if** $i < j$ **return** -1
2. **if** $i == j$ **return** $A[i]$
3. **if** $i + 1 == j$ **return** $\max(A[i], A[j])$
4. $k \leftarrow \lceil (j - i + 1)/3 \rceil$
5. $S_1 \leftarrow \text{Mystery}(A, i, i + k)$
6. $S_2 \leftarrow \text{Mystery}(A, i + k + 1, j - k)$
7. $S_3 \leftarrow \text{Mystery}(A, j - k + 1, j)$
8. **return** $\max(\max(S_1, S_2), S_3)$

- (a) What does line 4 compute? In other words, what is the value of k ?
- (b) What does the algorithm compute?
- (c) Write the running time as a recurrence.