CPS 130 Homework 4
Recurrences

due Wed May 22nd

Write and justify your answers in the space provided.[1]

1. (CLRS 4.2-2) Argue that the solution to the recurrence

$$T(n) = T(n/3) + T(2n/3) + n$$

is $\Omega(n \log n)$ by appealing to a recursion tree.

[1]Collaboration is allowed, even encouraged, provided that the names of the collaborators are listed along with the solutions. Students must write up the solutions on their own.

Give asymptotic upper and lower bounds for the following recurrences. Assume T(n) is constant for $n \leq 2$. Make your bounds as tight as possible, and justify your answers.

2. $T(n) = T(n-1) + n$

3. $T(n) = T(\sqrt{n}) + 1$

4. $T(n) = 2T(n/2) + n/\lg n$

5. $T(n) = T(n-1) + 1/n$