CPS 130 Homework 5
Recurrences; Quicksort

due Thu May 23rd

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

Give asymptotic upper and lower bounds for the following recurrences. Assume T(n) is constant for $n = 1$. Make your bounds as tight as possible, and justify your answers.

1. $T(n) = 2T(n/4) + \sqrt{n}$

[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.

2. $T(n) = 7T(n/2) + n^3$

3. $T(n) = 7T(n/2) + n^2$

4. $T(n) = 5T(n/5) + n/\log n$

5. (CLRS 7.1-2) Show that the running time of QUICKSORT is $\Theta(n \lg n)$ when all elements of arrary A have the same value.

6. (CLRS 7.2-3) Show that the runnning time of QUICKSORT is $\Theta(n^2)$ when the arrary A contains distinct elements and is sorted in decreasing order.