4-4 More recurrence examples

Give asymptotic upper and lower bounds for $T(n)$ in each of the following recurrences. Assume that $T(n)$ is constant for sufficiently small n. Make your bounds as tight as possible, and justify your answers.

a. $T(n)=3T(n/2)+n\lg n$.

b. $T(n)=5T(n/5)+n/\lg n$.

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

d. $T(n)=3T(n/3+5)+n/2$.

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

f. $T(n)=T(n/2)+T(n/4)+T(n/8)+n$.

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

h. $T(n)=T(n-1)+\lg n$.

i. $T(n)=T(n-2)+2\lg n$.

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

6.4-2

Argue the correctness of HEAPSORT using the following loop invariant:

At the start of each iteration of the **for** loop of lines 2–5, the subarray $A[1..i]$ is a max-heap containing the i smallest elements of $A[1..n]$, and the subarray $A[i + 1 .. n]$ contains the $n - i$ largest elements of $A[1 .. n]$, sorted.

6.4-5 ⋆
Show that when all elements are distinct, the best-case running time of heapsort is $(n \lg n)$.

درصورتی که تمرین ۴.۴ را قبلا ارسال کرده اید همان کافی است.

پاسخ خود را در فایل زیپ به نام HW۲-۹۵۳۱۰۰۱-AliAmadi.zip قرار دهید.