

Analysis of Algorithms

CS 375, Fall 2018

Homework 15

Due **AT THE BEGINNING OF CLASS** Wednesday, November 14

- **Reading Assignment:** From your textbook (Levitin), please read Chapter 8 (you can skip Section 8.3).
- *A general note:* When writing up your homework, please write neatly and explain your answers clearly, giving all details needed to make your answers easy to understand. Graders may not award credit to incomplete or illegible solutions. Clear communication *is* the point, on every assignment.

Exercises

1. Exercise 5.1.5, parts b and c. *Be sure to use the Master Theorem for these exercises.* As always, be sure to give a brief explanation of your answers—here, that will include what version of the Master Theorem you are applying (because two were presented in lecture), the values for each relevant variable in the Master Theorem, what case of the Theorem you are applying, and a very brief explanation of how you know what case to apply. (A full explanation could take no more than 3–4 sentences.)
2. Give Θ bounds for the following recurrences. As always, be sure to give a brief explanation of your answers.
 - (a) $T(n) = 4T(n/3) + n \lg n$, $T(1) = 1$.
 - (b) $T(n) = 4T(n/2) + n^2\sqrt{n}$, $T(1) = 1$.
3. Exercise 8.1.4. Please show the what the entire table is at every step of the algorithm, similar to Figure 8.2 in the book, as well as giving all of the requested solutions.