

## Analysis of Algorithms

CS 375, Spring 2019

Homework 10

Due **AT THE BEGINNING OF CLASS** Monday, April 8

- From your textbook (CLRS), please read Chapters 22.1–22.3.
- *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. Please finish the exercises given to you as part of the class presentations on Wednesday. Recall that each team will be grading the exercises they gave the class, so when you do the exercises, **please turn in each team's exercise(s) on a separate sheet of paper**.
2. CLRS 22.1-2 (pg. 592). (**Note:** A *complete binary tree* is one in which every level is filled in, left to right; a complete binary tree with 7 vertices has every node on three levels. See pg. 1179 for a definition of a complete tree.)
3. CLRS 22.2-2 (pg. 601). Explain your answer by showing every step in the process.
4. Show how depth-first search works on the graph of Figure 22.6 in CLRS by showing the resulting discovery time, finishing time, and  $\pi$  values. Once again, explain your answer by showing every step in the process.

Assume that the **for** loop of lines 5–7 of the DFS procedure considers the vertices in alphabetical order; further, assume that the graph has an adjacency list representation, and assume that each adjacency list is ordered alphabetically.