

Analysis of Algorithms
CS 375, Fall 2019

Homework 14

Due **AT THE BEGINNING OF CLASS** Wednesday, November 20

- From your textbook (CLRS), please read Chapter 25.2, Chapter 16 up to (and including) Section 16.2, and Chapter 23.
- *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. CLRS Exercise 15.4-5 (pg. 397).
2. In chess, a rook can move horizontally or vertically to any square in the same row or in the same column of a chessboard. Find the *number of shortest paths* by which a rook can move *from one corner of a chessboard to the diagonally opposite corner*. (The length of a path is measured by the number of squares it passes through, including the first and the last squares.)

Solve the problem by a dynamic programming method. That is, come up with a relevant recurrence—i.e., a recursive definition of the relevant values for a solution, as we’ve seen in the examples from class—and using dynamic programming techniques, calculate the solution. Note that you do not need to provide a shortest path from one corner to the other, just the number of shortest such paths. Please be sure to include an explanation of the correctness of your solution (a well-worded paragraph could suffice).