

Problem Set 4: *Dynamic Programming II*

Due: Thursday, February 6, 2014, at the beginning of class

1. Suppose that in the rod-cutting problem of Section 15.1, we also had limit l_i on the number of pieces of length i that we are allowed to produce, for $i = 1, 2, \dots, n$. Show that the optimal substructure property described in Section 15.1 no longer holds.
2. Work exercise 15.3-6 on page 390 (“Imagine that you...”). Also, address the last part of the exercise (i.e., in showing that the variant of the problem does not exhibit optimal substructure) by giving a counterexample (i.e., an example for which the optimal substructure property does not apply).
3. Work problem 15-5a, pgs 406-407 (“Edit distance”). *Note that you only need to solve part a.* In solving this problem, show your work for each of the 4 steps of dynamic programming (as listed on page 359). In doing this, you are going to be arguing that this problem exhibits optimal substructure (step 1), providing a recursive solution (step 2), giving pseudocode for computing the edit distance (step 3), and giving pseudocode for constructing the optimal operation sequence based on the edit distance (step 4).