

CSE 417: Algorithms and Computational Complexity
Assignment #4
February 11, 2004
due: Wednesday, February 18

In this assignment, you will implement the dynamic programming algorithm that finds the optimal separation of a sequences of words into lines. This is the problem of Section 10.5 in the text, but you should not base your implementation on the recursive algorithm of page 474, which is very confusing. Instead, use the recurrence I gave in lecture as the basis for an iterative dynamic programming algorithm: do *not* use recursion in implementing the dynamic programming.

Your program should take as input a file containing words, spaces, and line breaks, and an integer W (which is actually 1 more than the line width, as explained in the text). It should treat line breaks as though they were spaces, collapse multiple consecutive spaces into a single space, and use the dynamic programming algorithm to find the optimal placement of line breaks. It should then output the reformatted paragraph, with those optimally placed line breaks. You may assume that any character in the file other than a space or line break is to be treated as part of a word.

Use the penalty function $\text{lineCost}(X) = X^3$ as in the text's Example 10.8. But you should write your program in a modular way so that it is simple to change this function.

We will supply some paragraphs to use as input on the course web. Turn in your source code and its output on our paragraphs.