This document is to provide how you would answer a question from lecture if it were homework or exam questions instead. The text below, in black, would be sufficient for full credit if the LCS problem, presented in lecture, were instead a homework/exam question.

Define $\mathrm{LCS}(i, j)$ to be the longest common subsequence between $X[1 \ldots i]$ and $Y[1 \ldots j]$.

$\mathtt{LCS}(i, j)$
   if $i == 0$ or $j == 0$ **then**
      return 0
   if $X[i] == Y[j]$ **then**
      return $1 + \mathrm{LCS}(i - 1, j - 1)$
   return $\max(\mathrm{LCS}(i, j - 1), \mathrm{LCS}(i - 1, j))$

This can be stored in a two-dimensional vector, $\mathrm{LCS}[0 \ldots n, 0 \ldots m]$, where n and m are the lengths of the two input strings X and Y, respectively. This can then be filled in first by the base cases, and then the general cases can be filled in by increasing value of the first parameter, then increasing value of the second. Each recursive case takes $\mathcal{O}(1)$ to fill in, and there are $\mathcal{O}(nm)$ cases, for a total of $\mathcal{O}(mn)$ time.