CSE 6331 Homework 5

Due: Tuesday, February 13 by class time

Midterm Exam I: Thursday, February 15.
Topics: up to (including) dynamic programming.

Note: Write your algorithms in pseudo-code.

1. Consider the **first approach** to the longest common subsequence problem, where we solved the problem using the forward approach. Now, solve it using the backward approach. Your answer must include: the definition of $L(i, j)$, the definition of $\phi(k, j)$, the recurrence, boundary conditions, and the goal.

2. Implement the **third approach** of dynamic programming to the longest common subsequence problem. Your algorithm needs to print the actual longest common subsequence. Specifically, write two procedures: (1) a **non-recursive** procedure to compute $L(i, j)$, $1 \le i, j \le n$, and (2) a **recursive** procedure Longest(i, j) such that Longest(1,1) will print the longest common subsequence.

3. Consider the all-pair shortest paths problem. Suppose the **global** arrays $D[1..n, 1..n]$ and $P[1..n, 1..n]$, $1 \le k \le n$, have been computed as in Floyd's algorithm. Write a **recursive** procedure Path(i, j) such that a call to Path(i, j) will print the shortest path from i to j. Note: a path is a sequence of vertices. You may print a vertex more than once (e.g., it is OK to print a path (a, b, c, d) as (a, a, b, c, c, c, d).)