Problem Set #4 (Algorithms)

Department: _____

Student ID: _____

Student Name: _____

For the following problems, consider the longest common subsequence (LCS) of two sequences.

1. Find a top-down memoized algorithm to compute the length of the LCS of two sequences in $\Theta(mn)$ space.
 (a) Write the pseudocode and explain the pseudocode at least four lines.
 (b) Write the program which includes the comments.
 (c) Show the test results.
 (d) Explain the program and the test results at least four lines.

2. Find a bottom-up dynamic programming algorithm to compute the length of LCS of two sequences in $\Theta(mn)$ space.
 (a) Write the pseudocode and explain the pseudocode at least four lines.
 (b) Write the program which includes the comments.
 (c) Show the test results.
 (d) Explain the program and the test results at least four lines.

3. Find an algorithm to print an LCS of two sequences in $O(m+n)$ time by using the results of Problem 2.
 (a) Write the pseudocode and explain the pseudocode at least four lines.
 (b) Write the program which includes the comments.
 (c) Show the test results.
 (d) Explain the program and the test results at least four lines.