考試科目	資料結構	所別	資管系 / 科技組	考試時間	2月28日（六）第3節

I. Find the longest common subsequence (LCS) of two strings.

Consider the two strings:

X = AABBSCHAAA
Y = BABCSCA

The longest common subsequence of X and Y is ABSCA.

Use different ideas to define the algorithms with the following Pseudo code.

Algorithm: LCS(X, Y)
Input: two strings X and Y
Output: the longest common subsequence of X and Y

1. (20%) Define a brute-force algorithm with the above Pseudo code and analyze its time complexity
2. (20%) Define a greedy algorithm with the above Pseudo code. Find a counter example that the algorithm fails.
3. (20%) Define a dynamic-programming algorithm with the above Pseudo code. Show the recurrence equation on LCS.

II. Evaluate an arithmetic expression with tree data structure.

1. (20%) Represent the expression 8 * 2 + 3 * 6 -7 < 4 *(4 - 8 + 5) + 9 using a binary tree. (An internal node stores an operator, e.g., *, +, and an external node stores a value, e.g., 3, 5.)
2. (20%) Define a recursive algorithm to evaluate a binary-tree expression as below.

Algorithm: evaluateExpression(T, v)
Input: A binary tree T and a node v in T
Output: the value of v

備註	一、作答於試題上者，不予計分 二、試題請隨卷繳交。