CS 330 Intro to the Design and Analysis of Algorithms

Homework 5
(20 points)

1. Show the results of the DP algorithm for computing the longest common subsequence (LCS) as presented in class on the following input:

X = ABCACB
Y = BACAB

a. Show the contents of the LCS table. [4 points]
b. Also, show the matrix of helper values to obtain the solution. I would suggest representing them as arrows (like lecture), but you may represent them as you like, as long as you are able to explain your convention. [2 points]

2. A thief is robbing a store and can carry a maximal weight of W =25 into his knapsack. There are 4 items and weight of i^{th} item is W_i and the profit of selecting this item is P_i as given in the following table. Find a DP recurrence relation to help the thief making maximum profit. Use the DP table to find the items the thief should take. [6 points]

Item	**A**	**B**	**C**	**D**
Profit	24	18	18	10
Weight	24	10	10	7

3. Find a maximum flow from the source (vertex s) to the sink (vertex t) in the following network using the Ford-Fulkerson algorithm. [8 points]