

Due: 9th November 2023,
20% penalty for 1 day late
40% penalty for 2 days late
Submission not allowed afterwards

CS2009: Design and Analysis of Algorithms
Assignment 03
Total Marks: 100 points

Group assignment (Submission as a group of **3** students)

Go through the [website](#).

Understand how these problems can be solved using Dynamic Programming.
Now, solve each problem using an example.

- a) For Longest-Common-Subsequence, X: {B, First Alphabet in the Name of Group Member 1, C, A, B, A} and Y: {First vowel in the Name of Group Member 2, B, C, B, D, A, B}
- b) For Shortest-Common-Supersequence, X: First Name of Group Member 1 and Y: First Name of Group Member 2
- c) For Longest-Increasing-Subsequence, {4th Digit of Group Member 1, 10, 2, 4th Digit of Group Member 2, 20}
- d) For Levenshtein-distance (edit-distance) problem, str1 = "ELEPHANT", str2 = "RELEVANT"
- e) For Matrix Chain Multiplication, p0 = 2, p1 = 25, p2 = 3, p3 = 16, p4 = 1, p5 = length of first name of Group member 3, Show parenthesis at the end.
- f) For 0-1-knapsack-problem, Value = [1, 4, 5, 7, 4], Weight = [1, 3, 4, 5, 2], W = 9
- g) For the partition problem, The Set contains 6 numbers. The first three numbers are the conversion of the first three alphabets of Group Member 1 into respective numbers, and the last three numbers are from the first three alphabets of Group Member 3.
Just for an example (don't solve this example): if two group members are: Ahmed and Waqas then S = {1, 8, 13, 23, 1, 17}. That is by letting A = 1, B=2, C = 3, etc.
- h) For Rod Cutting Problem, length [] = {1, 2, 3, 4, 5, 6, 7, 8}, price [] = {1, 5, 8, 9, 10, 16, 18, 20}, Rod Length: 8.
- i) For Coin-change-making-problem, S = {1,5,6,8}, Desired Change is 13
- j) For Word Break Problem, S = {i, like, ice, cream, icecream, mobile, apple}, Input: ilikeapple.