Due Date: 18th November 2021   CS 2009: Design and Analysis of Algorithms
20% penalty for 1 day late   Assignment 03
40% penalty for 2 days late   Total Marks: 100 points
Submission not allowed afterwards
Group assignment: Do it in a group of total 2 students

1. Go through the website https://medium.com/@codingfreak/top-10-dynamic-programming-problems-5da486eeb360. Understand how these problems can be solved using Dynamic Programming. Now, solve each problem using an example [100 Points]

   a) For Longest-Common-Subsequence, X: BACDB and Y: BDCB
   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 = "INTENTION", str2 = "EXECUTION"
   e) For Matrix Chain Multiplication, $p0 = 2$, $p1 = 25$, $p2 = 3$, $p3 = 16$, $p4 = 1$ $p5 =1000$, Show parenthesis at the end
   f) For 0-1-knapsack-problem, Value = [2,3,1,4], Weight = [3,4,6,5], W = 8
   g) For Partition-problem, The Set contains 6 numbers. The first three numbers are the conversion of first three alphabets of Group member 1 into respective numbers, and the last three numbers are from the first three alphabets of Group member 2.
      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[] = {1,5,8,9,10,17,17,20}, Rod Length: 6
   i) For Coin-change-making-problem, S = {1,5,6,8}, Desired Change is 11
   j) For Word Break Problem, S = {i, like, sam, sung, samsung, mobile, ice, cream, icecream, man, go, mango}, Input: Ilikemobile