CS302: Design and Analysis of Algorithms
Assignment 02

Due Date: 29th Oct 2019 **Total Marks: 100 Points**
Group Assignment of 2

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1. Illustrate (by steps) on the array
   A={0.535,0.960,0.750,0.750,0.151,0.001,0.981,0.327,0.111}
   the operations by Quick Sort, Radix Sort, Bucket Sort. For Counting Sort, use B = {4,2,8,9,0,1,1,3,3,3}. Discuss Time Complexity of each sorting algorithm [20 Points]

2. Solve 8.2.2, 8.2.3, 8.3.1, 8.3.2, 8.3.3, 8.3.4 from Book [30 Points]

3. 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 [50 Points]

   (a) For Longest Common Subsequence, X: BDCABA and Y: ABCBDAB

   (b) For Shortest-Common-Supersequence, X: HELLO and Y: GEEK

   (c) For Longest-increasing-subsequence, {3, 10, 2, 1, 20}

   (d) For Levenshtein-distance (edit-distance) problem, str1 = "cat", str2 = "cut"

   (e) For Matrix Chain Multiplication, $p_0 = 3, p_1 = 2, p_2 = 5, p_3 = 6, p_4 = 3$, Show parenthesis at the end

   (f) For 0-1-knapsack-problem, Value = [20, 5, 10, 40, 15, 25], Weight = [1,2,3,8,74], W = 10

   (g) For Partition-problem, S = {3,1,1,2,2,1},

   (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: 4

   (i) For Coin-change-making-problem, S = {1,3,5,7}, Desired Change is 18

   (j) For Word Break Problem, S = { i, like, sam, sung, samsung, mobile, ice, cream, icecream, man, go, mango}, Input: Ilikesamsung