

Algorithms and Problem Solving (15B11CI411)

Tutorial – 12

Week 12 (16-21 April, 2018)

(Dynamic Programming/String)

Q1. Find an optimal parenthesization of a matrix-chain product whose sequence of dimensions is $\langle 5, 10, 3, 12, 5, 50, 6 \rangle$

Q2. Determine an LCS of $\langle 1, 0, 0, 1, 0, 1, 0, 1 \rangle$ and $\langle 0, 1, 0, 1, 1, 0, 1, 1, 0 \rangle$

Q3. Longest Palindrome Subsequence: A sequence is a palindrome if it reads the same whether we read it left to right or right to left. For example A, C, G, G, G, G, C, A. Given a sequence of length n , devise an algorithm to output the length of the longest palindrome subsequence. For example, the string A, G, C, T, C, B, M, A, A, C, T, G, G, A, M has many palindromes as subsequences, for instance: A, G, T, C, M, C, T, G, A has length 9.

Q4. A circus is designing a tower routine consisting of people standing atop one another's shoulders. For practical and aesthetic reasons, each person must be both shorter and lighter than the person below him or her. Given the heights and weights of each person in the circus, write a method to compute the largest possible number of people in such a tower.

Q5. Given a string "ABCCBCBA", give an algorithm for recursively removing the adjacent characters if they are the same. For example, ABCCBCBA > ABBCBA - > ACBA