Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam - 603 110
(An Autonomous Institution, Affiliated to Anna University, Chennai)

UCS2403: DESIGN & ANALYSIS OF ALGORITHMS

Assignment 8

1. Given the adjacency matrix representation of a simple weighted, directed graph $G = (V, E)$, write a Python program to implement the Floyd-Warshall algorithm.

2. You are given a string S consisting of lowercase letters. Find the length of the longest palindromic subsequence in the string. A palindromic subsequence is a subsequence of the string that is read the same forward and backward. Implement a dynamic programming algorithm to solve this problem efficiently.
   Example: Input string: abacbca
   The solution is 5.

3. *In computational linguistics and computer science, edit distance is a string metric, i.e. a way of quantifying how dissimilar two strings are to one another, that is measured by counting the minimum number of operations required to transform one string into the other* (Source: Wikipedia).

   These operations include insert a character, remove a character or update a character. Develop and implement a bottom-up dynamic programming algorithm to compute the edit distance between two strings s_1 and s_2.

   Example:

   ```
   Input: s1 = "intention", s2 = "execution"
   Output: 5
   Explanation:
   intention -> inention (remove 't')
   inention -> enention (replace 'i' with 'e')
   enention -> exention (replace 'n' with 'x')
   exention -> exection (replace 'n' with 'c')
   exection -> execution (insert 'u')
   ```