



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY
Algorithm Laboratory (CSLR41)

Assignment 8

Problem Statement: Given a list of cities and the distances between each pair of cities, what is the shortest possible route that visits each city exactly once and returns to the origin city.

Input: The number of cities: n

Part A: Assume random weights between each pair of the cities.

Now, write an algorithm (program) to solve the problem statement. Plot and show the time complexity of your solution.

Part B: Consider that for every pair of cities (A,B), the direct connection from A to B is never farther than the route via intermediate C. Under this condition, reassign the weights for your input cities, if necessary. Now, for this new graph, find a near-optimal efficient solution for which the time complexity is polynomial. Plot and show the time complexity and compare with the solution over the same weight graph with algorithm of Part A. How bad is your solution? Show the approximation ratio.