Assignment 2

Design and analysis of Algorithms – Fall 2016, Section B

NOTE: Plagiarism will not be tolerated, minimum penalty is zero in ALL assignments.

Q1: Draw a graph on which dijkstra fails, run and show why it fails. Show working. (10)

Q2: Given there is only one -ve edge weight in a graph; how about if we add a constant such that all nodes become +ve. Will minimum path from any given source vertex remains same? If not, how can we correct it? (10)

Q3: Suppose in a graph there is only one edge with a small positive weight, and all other edges are of weight 1, how can you find shortest path in O(V+E). Explain by drawing graph. (10)

Q4: Another way to topologically sort is to find vertex having in-degree of 0. Output that vertex from left to right and remove it from graph. Now find again any vertex having in-degree of 0 and output it and then remove it, so on. Will this produce correct sorting? Show it on a graph and if it fails show why it fails on your graph. (10)