Introduction to Algorithm Engineering

Spring 2024

Homework 2

Issue Date: March 15, 2024 Due Date: 26th March 2024

1. Show how the algorithms of Jen-Schmidt works on a graph of about 12 vertices and 15 edges. Where does the algorithm fail if the input graph is NOT biconnected? Explain your answer.
   (4+2=6 points)

2. Write a program to transpose a large matrix (not necessarily square) using
   a. A naïve nested loop approach
   b. A recursive approach
   c. Reading an appropriate sized submatrix, transpose the submatrix, and write the submatrix back.

   Compare the three programs with respect to their runtime on your system over varying matrix sizes. Make sure you test your program on as large matrices as possible. Recall your answer to Q2 in HW1 that mentioned the parameters of your system. Plot the results using software such as gnuplot or excel charts. You should submit the plot along with your source codes.

   (3+3+3+3 = 12 points)