Algorithms Analysis and Design
April 2019

Lab 3

Preliminary task:

In this lab you will first be required to generate a weighted digraph. The number of vertices will be given as a parameter to your program and your prelimiary program should generate a random, non-trivial connected graph having the number of vertices that you have input. (Number of vertices not exceeding 26: maximum number of alphabets)

Main task:

Implement two variations of Dijkstra's algorithm to find the shortest path between any two arbitrary vertices in the digraph and store this information for future retrieval. One implementation would use the normal queues and the other would make use of a binary heap (min-heap).

During the demostration you will be asked questions about:

- The algorithm that you have used to generate the digraph
- Implementations of both algorithms
- The data structures used to implement your algorithm
- The time and space complexity of both the algorithms as a function of the number of the vertices that you have generated in the preliminary exercise.