COSC 2123/1285 Algorithms and Analysis
Tutorial 3
Brute Force Algorithmic Paradigm

Objective

Students who complete this tutorial should:

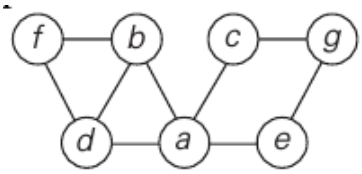
- Understand and apply selection and bubble sort.
- Understand and apply exhaustive search.
- Understand and apply BFS and DFS graph traversals.

Questions

3.1.8 Sort the list "`E, X, A, M, P, L, E`" in alphabetical order by selection sort.

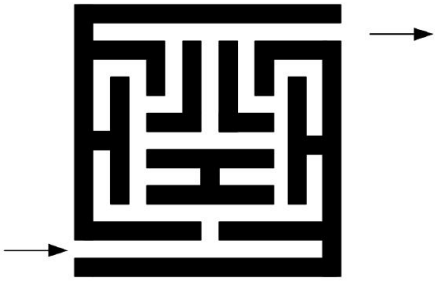
3.1.11 Sort the list "`E, X, A, M, P, L, E`" in alphabetical order by bubble sort.

3.5.4 Traverse the following graph by breadth-first search (BFS) and construct the corresponding breadth-first search tree. Start the traversal at vertex a and resolve ties by the vertex alphabetical order.



3.5.1b Repeat question 3.5.4, but now using depth-first search (DFS) traversal. Also start the traversal at vertex a and resolve ties by the vertex alphabetical order.

3.5.1 One can model a maze by having a vertex for a starting point, a finishing point, dead ends, and all the points in the maze where more than one path can be taken, and then connecting the vertices according to the paths in the maze.



a Construct such a graph for the maze.

b Which traversal – DFS or BFS – would you use if you found yourself in a maze and why?

3.4.6 Consider the **partition** problem: given n positive integers, partition them into two disjoint subsets with the same sum of their elements. (Of course, the problem does not always have a solution.) Design an exhaustive-search algorithm for this problem. Try to minimize the number of subsets the algorithm needs to generate.

