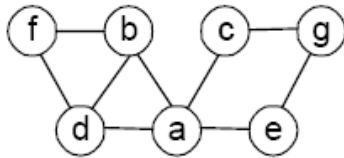# CPSC 5031 Algorithms
HW #5 (6 pts)

## I. Exercises 3.5 #1 (4 points)

1. Consider the following graph.

a. Write down the adjacency matrix and adjacency lists specifying this graph. Assume that the matrix rows and columns and vertices in the adjacency lists follow in the alphabetical order of the vertex labels.

b. Starting at vertex a and resolving ties by the vertex alphabetical order, traverse the graph by depth-first search and construct the corresponding depth-first search tree. Give the order in which the vertices were reached for the first time (pushed onto the traversal stack) and the order in which the vertices became dead ends (popped off the stack).

II. Exercises 3.5 #4 (2 points)

4. Traverse the graph of Problem 1 by breadth-first search and construct the corresponding breadth-first search tree. Start the traversal at vertex a and resolve ties by the vertex alphabetical order.

III. Exercises 4.2 #1 (4 points)

Starting at vertex a and resolving ties by the vertex alphabetical order, apply the DFS-based algorithm to solve the topological sorting problem for the following digraphs. Give the order in which the vertices were reached for the first time (pushed onto the traversal stack) and the order in which the vertices became dead ends (popped off the stack).
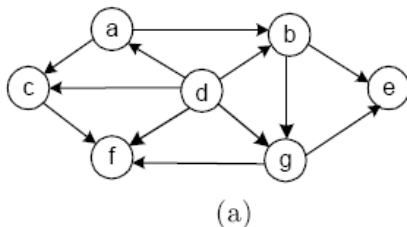
(a)
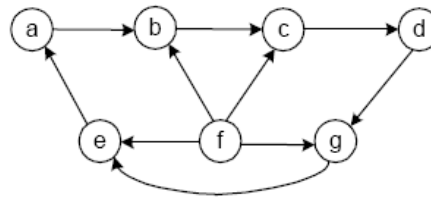
(b)

Note(s):
- All problems may be found in the Levitin textbook.

Submission:
- Deadline: Monday, May/8/2023, 11:59pm
- Submit your solutions on Canvas under HW #5