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Homework 2

Describe your algorithm in English.

1.)a First my algorithm would start at a vertex with no successors and mark it as visited and set it as the current vertex. Then the algorithm would visit all adjacent unvisited vertexes and mark them as visited and store them in a queue. Then the algorithm would delete the current vertex and store it in list L.

Next it would peek at the first vertex from the queue and check if it has any successors. If it has no successors, then it would remove the vertex from the queue set it to current. Then it would visit all adjacent unvisited vertexes and mark them as visited and store them in a queue. Then it would delete the vertex and store it in list L. The algorithm would repeat this process until it pulls a vertex from the queue which has a successor.

In this case it would find a new, unvisited vertex in the graph with no successors and mark it visited, store it in the queue and set it to current. Then it would repeat the process of looking at all adjacent vertices, marking them as visited, putting them in the queue, deleting and storing the current vertex in list L, peeking at a vertex from the queue, checking if it has any successors, setting it to current if it has none, marking all adjacent vertices as visited … until every vertex is gone. Then it would print list L.

If your algorithm is applied to Fig.1, what is the algorithm’s output?

b Output : ADBCEFGH

If this algorithm is applied to Fig.1, what is the final list L?

2.)a L = CFBAEDGH

Why is “if n has a temporary mark then stop” necessary?

b This is to ensure that nodes who have been marked temporarily do not get visit() called on the nodes which are accessible from it via an edge. If a node has a temporary mark then visit() has already been called on the nodes at the end of their edges. If this check were not in place then an infinite loop would be possible.

What is the purpose of having “unmark n temporarily”?

c This shows that the algorithm has already visited all nodes accessible by edge from n.

What will happen if “unmark n temporarily” is removed?

d Nothing