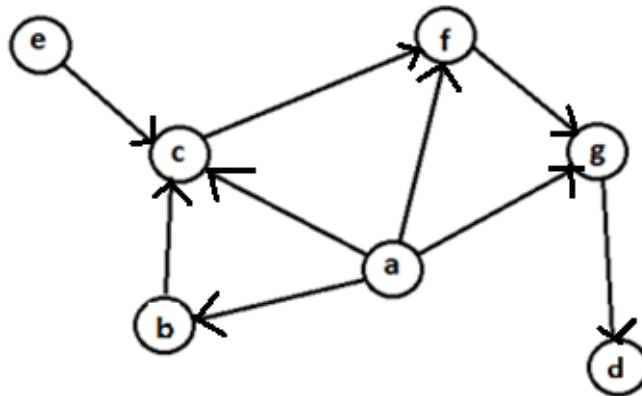
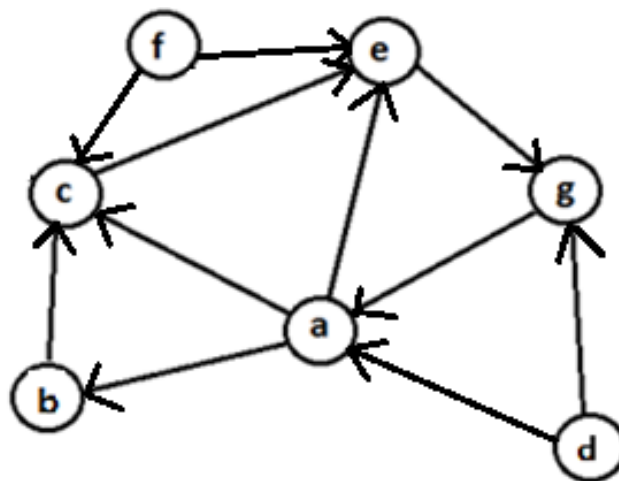


HW5

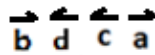
1. Use DFS to find a topological sort on the following graph. "Mark" each node as Depth First Search would find each node in the following graph. Label each edge as **forward**, back, cross, or tree (f,b,c,t). You may stop early if you discover the graph is not a Dag (explain why). Assume each item is visited in alphabetic order for both restarting DFS and also for visiting edges (start at "a" and visit adjacent nodes that are alphabetically before others as you expand each tree).



2. Use the Source removal to find a topological sort of the following graph. If you cannot do so, then indicate why (start the algorithm and , possibly, stop when you cannot continue or otherwise know the graph is not a Dag). If you cannot give a topological sort, state briefly why.



3. Perform 5 rounds of Johnson Trotter on the following input. Assume that $d > c > b > a$, meaning that d will definitely “move” first.


b d c a

4. Perform Quickselect on the following numbers. You are trying to find the median (middle) value. Use Lomuto Partitioning to partition. Add a piece of paper, use back, or better, use Excel. It is fine to combine the scanning into one line (until one less than pivot is found) and then perform the swap in the next line). Indicate the position of the pivot(p), split(s), and loop counter (i) in your work.

5 2 6 1 7 3 4