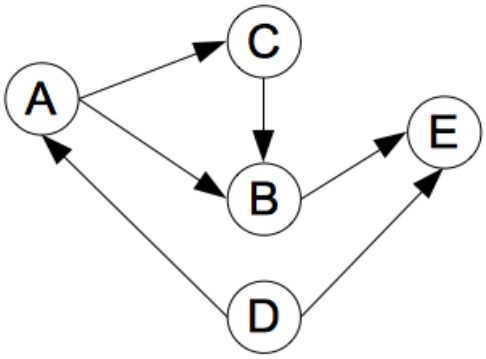
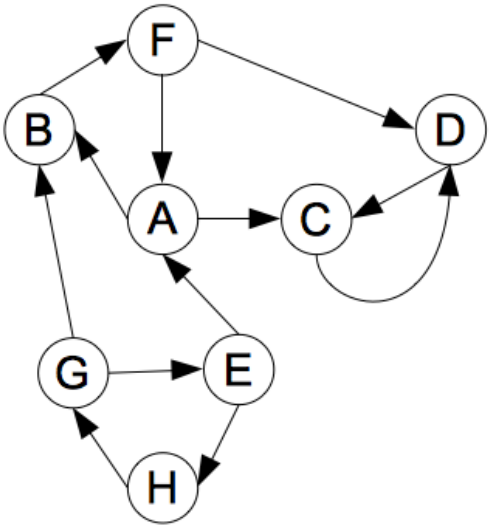
Writing Assignment # 6

Digraphs

Due April 12, 2010



Graph 1



Graph 2

1. a) **T/F**: Graph 1 is a DAG.
   b) What are the sources and sinks of graph 1?

2. a) **T/F**: Graph 2 is a DAG.
   b) What are the sources and sinks of graph 2?

3. Give the strongly connected components of graphs 1 and 2.

4. Give the transitive closure of graphs 1 and 2.

5. Using the XOR operation, describe the relationship between the transitive closure matrix of a digraph and the strongly connected components of that graph?

Bonus: Given the transitive closure matrix of a digraph, give an O(N) algorithm which determines whether the digraph is a DAG (N is number of nodes in graph).