

# CS 624: Analysis of Algorithms

## Assignment 8

Due: Monday, April 2, 2018

1. Exercise 22.5-2 (page 620).
2. Exercise 22.5-4 (page 620). (This looks complicated and confusing. It isn't.)
3. Give an example to show that the pre-order numbering of a DAG may not topologically sort the DAG.
4. Prove that if we start with a connected *undirected* graph, then the depth-first walk algorithm always yields a spanning tree (i.e., not a forest of trees).
5. In an undirected graph  $G$  a set of vertices  $C$  is called a *clique* iff every two vertices of  $C$  are connected by an edge. Prove that in the spanning (directed) tree resulting from a depth-first walk of  $G$ , all the vertices of  $C$  appear on one directed path. That is, there is a path of tree edges such that every element of the clique is on the path.
6. Exercise 1.1 in the Lecture 14 handout.
7. Exercise 1.2 in the Lecture 14 handout.
8. Exercise 1.3 in the Lecture 14 handout.
9. Exercise 1.4 in the Lecture 14 handout.
10. Exercise 1.6 in the Lecture 14 handout.
11. Exercise 1.8 in the Lecture 14 handout.