

CSE 101 Spring 2020

Quiz 3

Solutions

1. (25 Points) Run DFS on the digraph G having the adjacency list representation below. Pseudo code for DFS can be found in the textbook, or on page 5 of the [handout on graph algorithms](#). Process vertices in order of increasing labels in the main loop 5-7 of DFS and in loop 3-6 of Visit.

```
1 : 2 4
2 : 3 5 6
3 :
4 :
5 : 3 4 6
6 :
```

Determine the topological sort of $V(G)$ given by decreasing finish times in your run of DFS. Determine the total number of different topological sorts of $V(G)$.

Solution:

Topological sort: 1 2 5 6 4 3

This digraph admits 6 different topological sorts.

2. (25 Points) Insert the following keys (in order) into an initially empty BST: 5 9 7 2 6 4 8 3 1. Determine the order in which keys are processed in the following tree traversals. The algorithm for BST insertion can be found [here](#). The algorithms for tree traversals can be found in Chapter 12 of the textbook.
- a. (5 Points) In-order tree walk.
 - b. (10 Points) Pre-order tree walk.
 - c. (10 Points) Post-order tree walk.

Solution:

- a. 1 2 3 4 5 6 7 8 9
- b. 5 2 1 4 3 9 7 6 8
- c. 1 3 4 2 6 8 7 9 5