## EL9343 Homework 4 (Due Nov 22, 2018)

All problem/exercise numbers are for the third edition of CLRS text book.

- **1**. Exercise 22.1-3
- **2.** Exercise 22.1-5
- **3**. Exercise 22.2-6
- **4.** Given an O(V + E)-time algorithm to compute a path in a connected undirected graph G = (V, E) that traverses each edge in E exactly once in each direction.
- **5**. Exercise 22.3-12
- **6.** Exercise 22.4-1
- 7 Show how the procedure Strongly-Connected-Components works on the graph in Figure 1. Show the finishing times computed in line 1 and the forest produced in line 3. Assume DFS considers vertices in alphabetical order and and the adjacency lists are also alphabetical order.

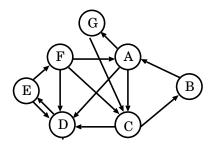


Figure 1: Directed Graph for Question 7

- **8.** Problem 22-1
- **9**. Problem 22-3
- 10. Exercise 12.2-1 in CLRS Text book
- 11. Exercise 12.2-5 in CLRS Text book
- **12.** Exercise 12.3-3 in CLRS Text book
- 13. For the AVL Tree A in Figure 2, construct one insertion to trigger each of the four imbalance cases defined on slide 20, for each case,
  - (a) what is the key value inserted?
  - (b) how many rotations needed to restore the AVL tree property?
  - (c) what is the restored AVL tree with the inserted key?

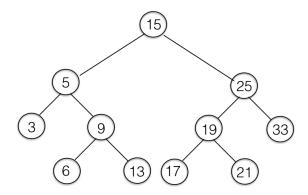


Figure 2: AVL Tree for Question 10