CSDS 233 Spring Session 5

SI Leader: Jakob Danninger

2/14/2022

Disclosure: This is a supplement to class, not a replacement. This should not be your only study activity for exams, it should aid you in studying. I do not have the actual exam so questions here will differ from those on the exam.

Session Objectives:

1) Be able to explain what a Stack and Que
2) Be able to implement a Stack and Que using a linked list and using a Circular array
3) Define basic definitions of a tree
4) Be able to traverse a tree in order, pre order, and post order

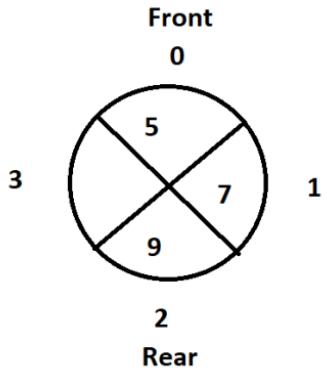
Questions

1) What are the core principles of stack and que?

2) Draw the following: Stack: push 5, push 3, pop, push 2, pop

3) Draw the following: Queue: enqueue 5, enqueue 3, dequeue, enqueue 2, dequeue

4) Re-label the front and rear of the following circular array queue of size 4 after the following operation: dequeue, enqueue 8, dequeue



5) What is a binary tree? (what makes it binary) . . . What is a leaf in a tree? What is a tree root?

6) What is in order traversal? Postoder? Preorder? What is the order each takes. . . if you are doing this at home here is a good place to learn

7) Write the pre order, post order, and in order traversals of the following trees

a.

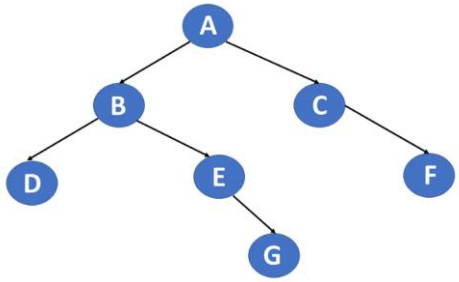
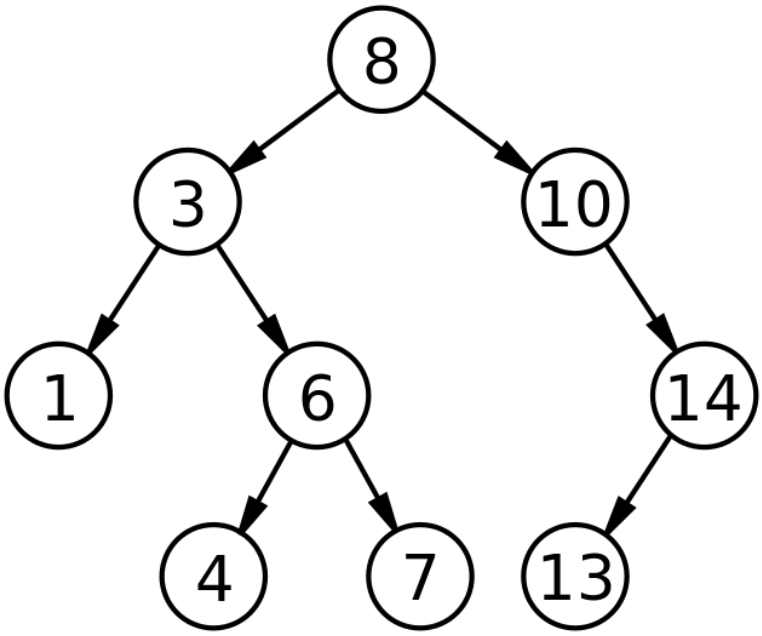


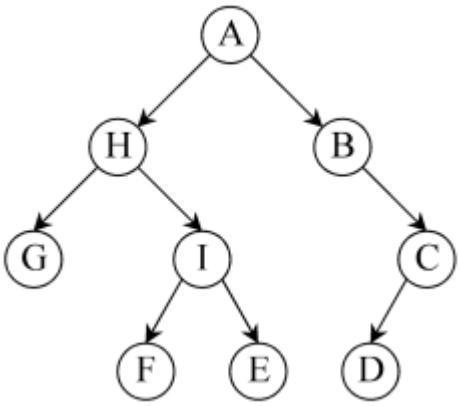
image from Simplilearn

b.



from [wikipedia]

c.



also from Wikipedia

Exam Like Question (This question is based off of my midterm exam hardest question . . . most people in my class were unable to answer it but got partial credit for showing work . . . question worth 10% of midterm)

Given the following in-order and pre-order lists, construct a binary tree:

```
Inorder Traversal : { 4, 2, 1, 7, 5, 8, 3, 6 }
Preorder Traversal: { 1, 2, 4, 3, 5, 7, 8, 6 }
```

- Question taken from here

Next SI is on 2/16 and will cover Binary Search Trees, methods, and basic code