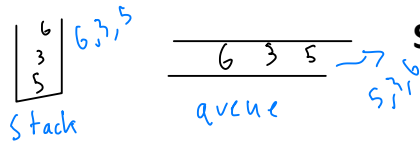


push  $\rightarrow$  add  $\leftarrow$  ena  
 pop  $\rightarrow$  remove  $\leftarrow$  dea  
 5, 3, 6

## 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:

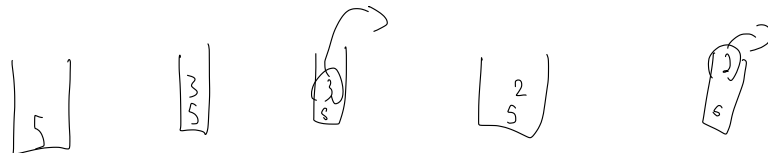
- 1) Be able to explain what a Stack and Que
- 2) Be able to implement a Stack and Que using a linked list and using a Circular array
- 3) Define basic definitions of a tree
- 4) Be able to traverse a tree in order, pre order, and post order

### Questions

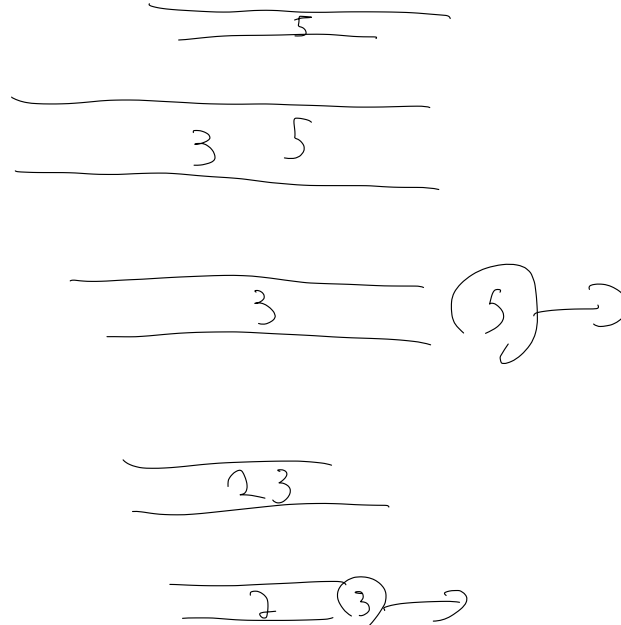
- 1) What are the core principles of stack and que?

Stack: LIFO  
 Queue: FIFO

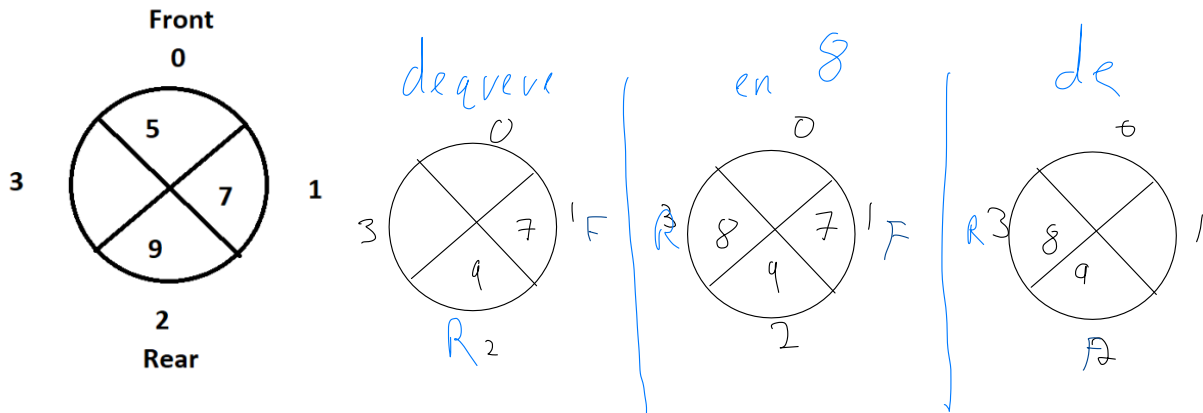
- 2) Draw the following: Stack: push 5, push 3, pop, push 2, pop



- 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?

max 2  
child

no  
children  
node

top node  
of tree

- 6) What is in order traversal? Postorder? Preorder? What is the order each takes. ... if you are doing this at home [here is a good place to learn](#)

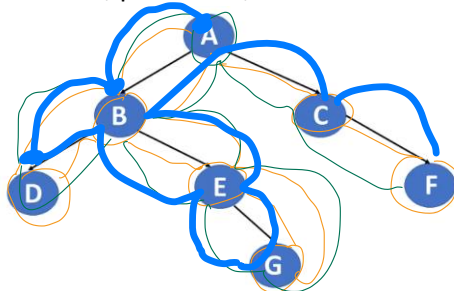
Inorder : LCR

Preorder : CLR

Post order : LRC

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

$h=3$



in D, B, E, G, A, C, F

pre A, B, D, E, G, C, F

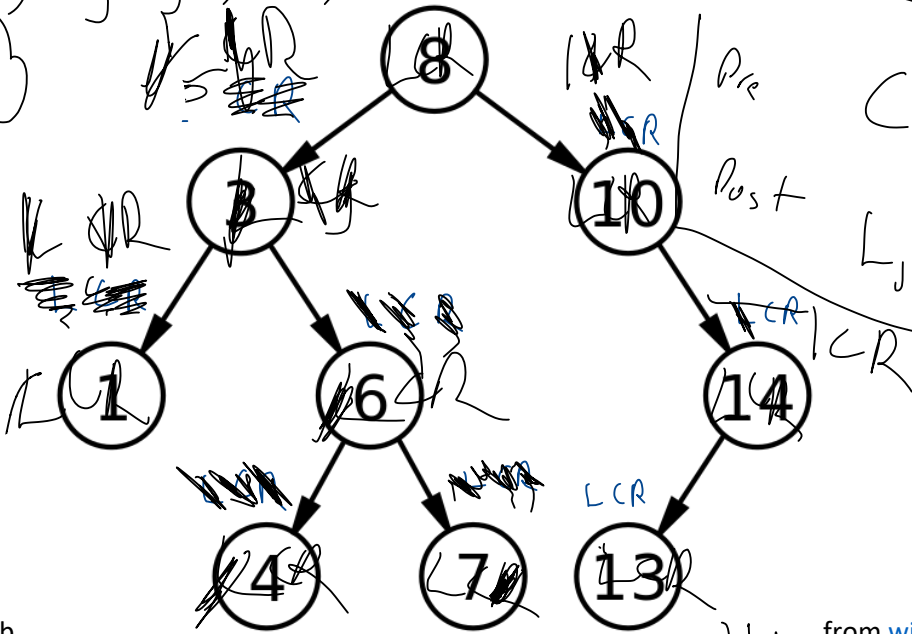
post D, G, E, B, F, C, A

image from Simplilearn

8, 3, 1, 6, 4, 7,  
10, 14, 13

In : 1, 3, 4, 6, 7, 8, 10, 13, 14  
Pre : 8, 3, 1, 6, 4, 7, 10, 14, 13  
Post : 1, 4, 7, 6, 3, 13, 14, 10, 8

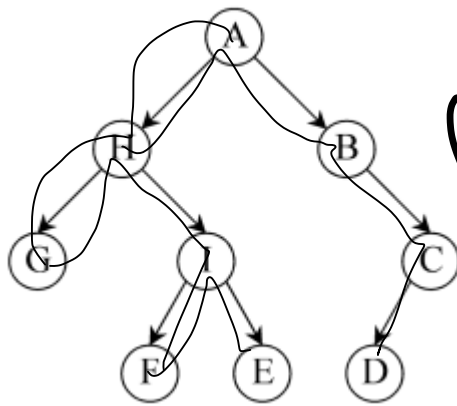
1, 4, 7, 6,  
7,



b.  
1, 3, 4, 6, 7, 8, 10, 13, 14

from [wikipedia](https://en.wikipedia.org/wiki/Binary_search_tree)

In : G, H, F, I, E, A, B, D, C  
Pre : A, H, G, I, F, E, B, C, D  
Post : G, F, E, I, H, D, C, B, A



c.

also from Wikipedia

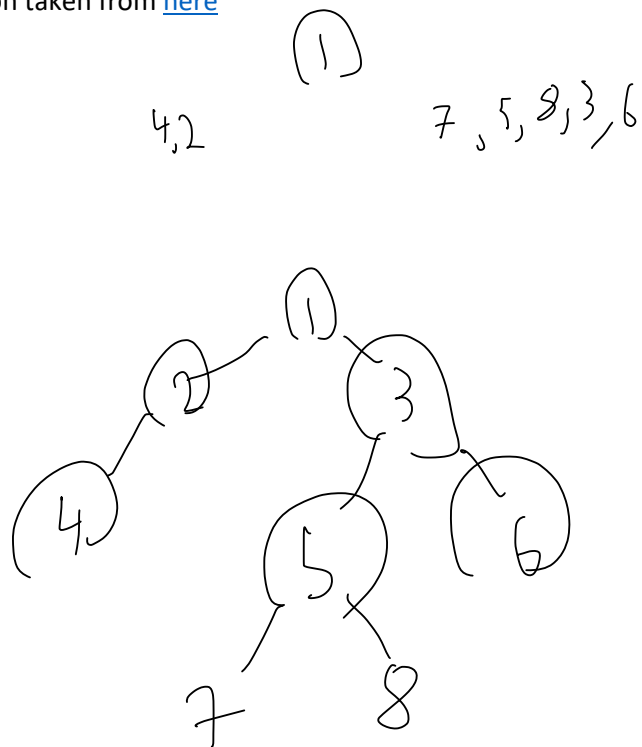
**Exam Like Question (This question is based off of my midterm exam hardest question . . . most people in my class were unable to answer it but got partial credit for showing work . . . question worth 10% of midterm)**

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