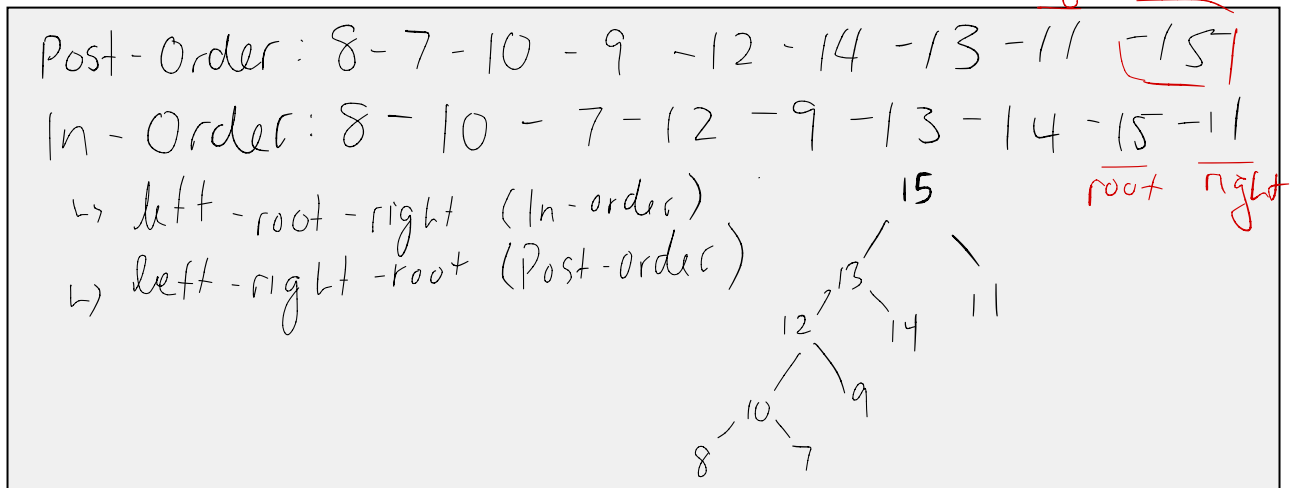


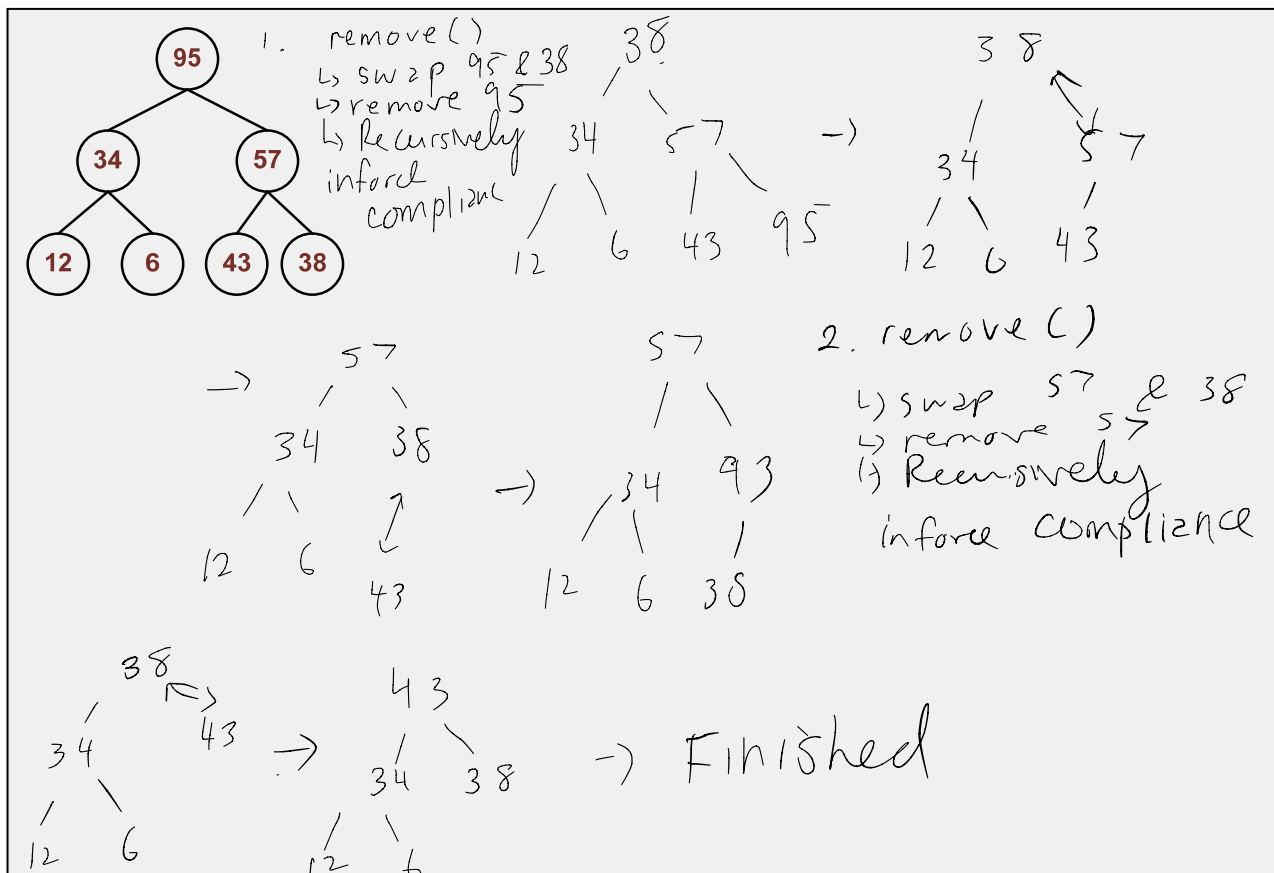
Review Activity 12

Binary Trees, Tree Traversals, Heaps

- 1) A binary tree was processed using post-order and in-order traversals. For post-order, the output derived is [8, 7, 10, 9, 12, 14, 13, 11, 15]. For in-order, the output is [8, 10, 7, 12, 9, 13, 14, 15, 11]. Draw a binary tree that complies with the traversals above. Show how you have derived the tree. *right root*



- 2) Run the remove function two times on the following max-heap (i.e., remove two elements from the heap). Show steps used in deriving your solution.



3) Consider the following array representation of a complete binary tree:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
--	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

a. What is the parent of L? Also, write the formula that you used to derive the value.

$$\text{floor}(i/2)$$

$$= 6$$

\therefore Parent is F

b. What is the right child of E? Also, write the formula that you used to derive the value.

$$(2i + 1)$$

$$= 11$$

\therefore Right child is K

c. What is the left child of C? Also, write the formula that you used to derive the value.

$$(2i)$$

$$= 6$$

F

d. List all the leaf nodes. Also, write the formula that you used to derive the values.

if leaf node $n < 2i$

$$16 < 2i$$

$$8 < i$$

$$\therefore 9 - 16$$

[I, J, K, L, M, N, O, P]

4) Insert the following nodes into an empty max-heap: 17 22 29 62 83 14

Show steps used in deriving your solution.

1. Insert node at bottom right
2. parent has a smaller value, then switch
3. Recursively continue upward

