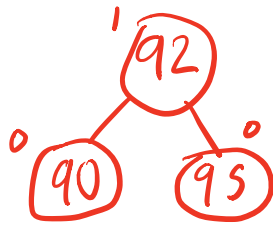
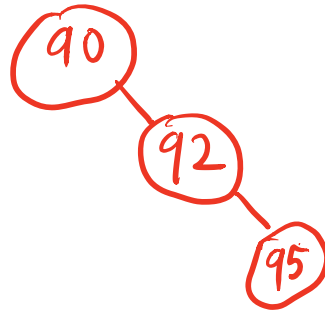
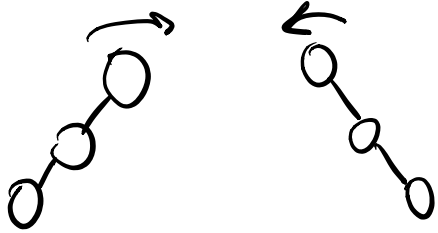
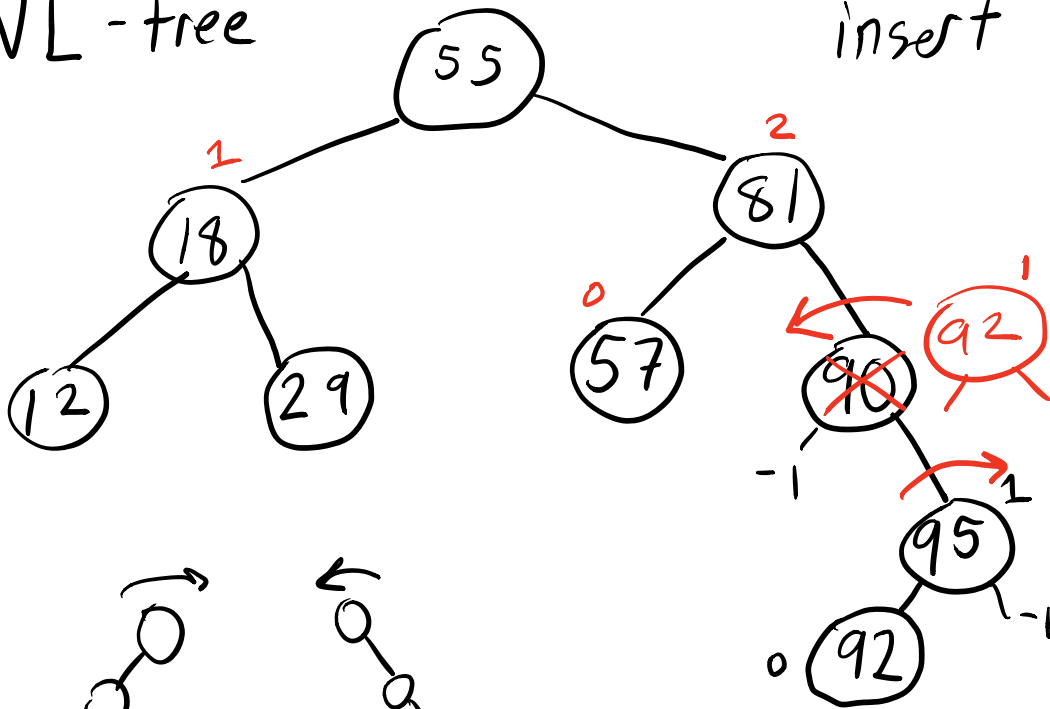
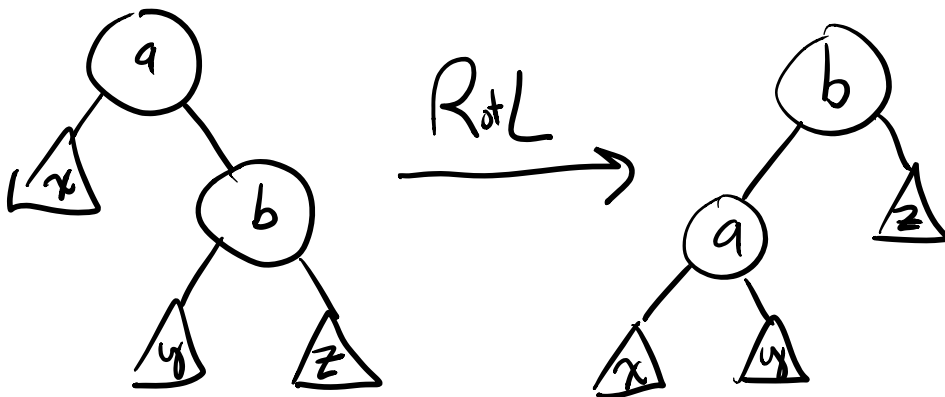
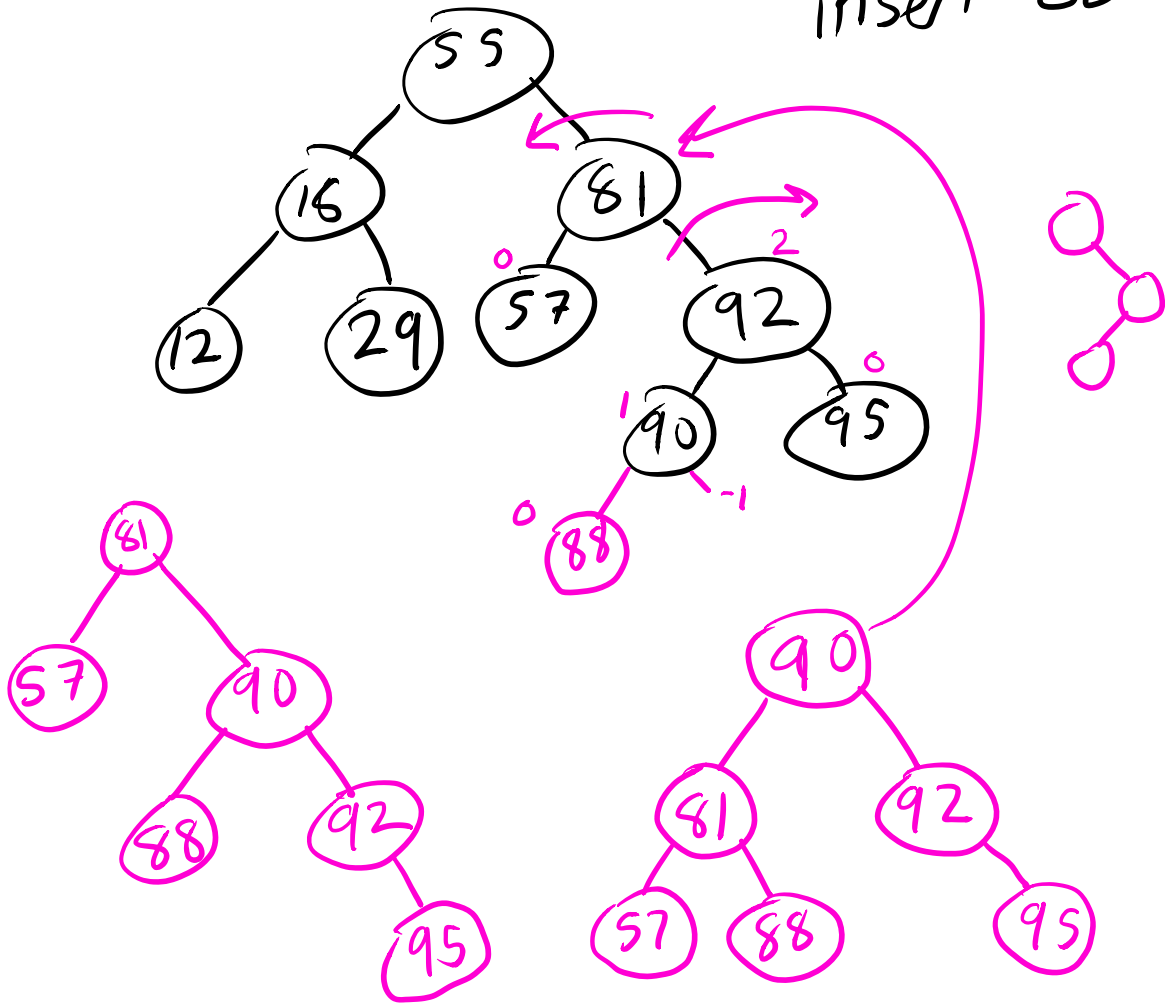


AVL-tree

insert 92



insert 88



# Priority Queue ADT

	linked list	array list	BST	AVL
insert		$O(n)$	$O(1)$	$O(h)$
remove		$O(1)$	$O(n)$	$O(h)$
getFirstValue		$O(1)$	$O(n)$	$O(h)$
getFirstPriority		$O(1)$	$O(n)$	$O(h)$

sorted

not sorted

problem:  
duplicate priorities

(min)

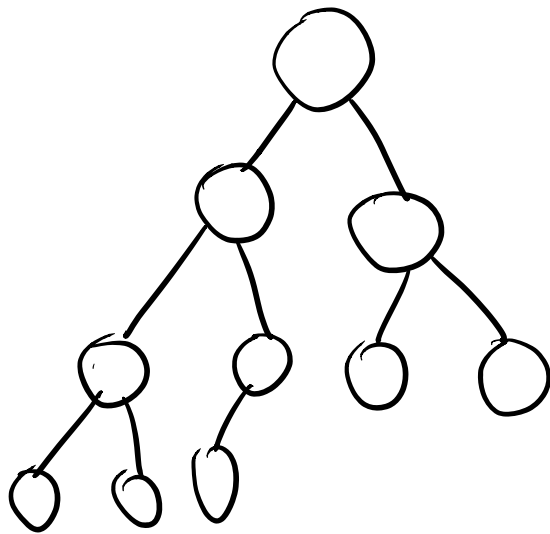
## Max Heap

A complete binary tree where

every child has priority

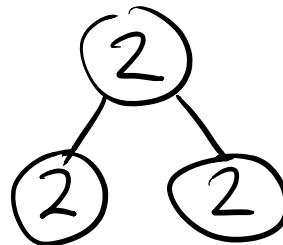
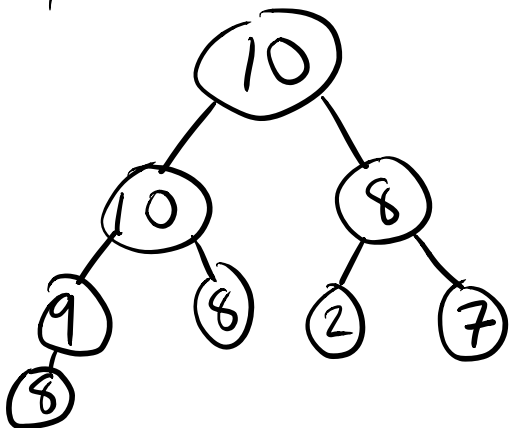
less than or equal to its  
(greater) parent's.

A binary tree is complete if all levels (except possibly the last) are full, and the last level is left-aligned.

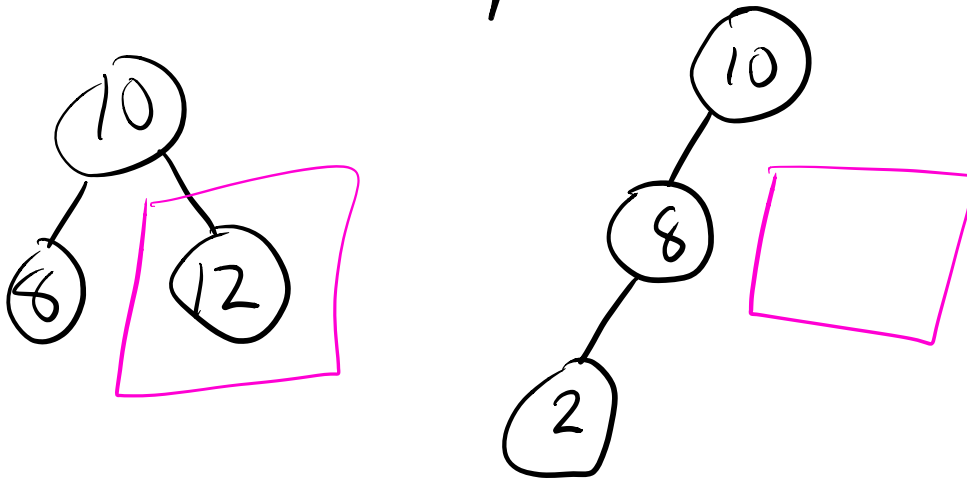


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Max heaps

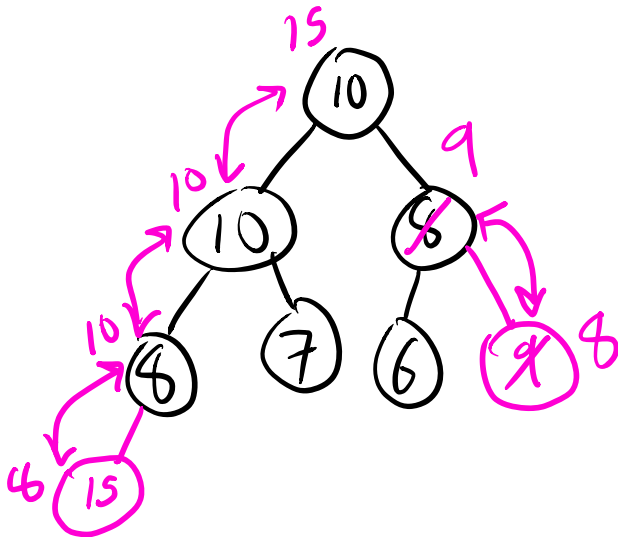


Not max heaps



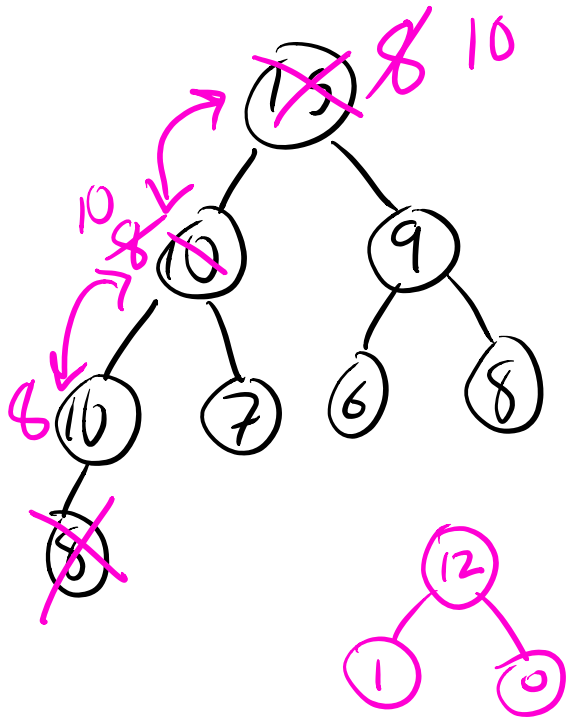
Insert

- maintain completeness
- maintain heap invariant



insert 9  
insert 15

"bubble up"



remove

"bubble down"