ER triage
- chest pain
- fever
- breathing

} Example of prioritization

- Boarding group
- Fast pass
- Orders for restaurant prioritized by need of completion
- CS Lottery

ADTs — interface w/ set of operations to interact w/ data

List — ArrayList, LinkedList

Stack — LinkedStack

Queues — LinkedQueue

Dictionary — LinkedBST

PriorityQueue — MaxHeap

Data Structure — implementation of ADT

PriorityQueue<P, V>

- void enqueue(P priority, V value)
- V dequeue() ← return the element w/ highest priority which hasn't been returned
- int getSize()
- V peek()
- P peekPriority()

Implementation

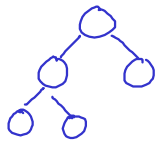
- BST where keys are priorities and values are queues of V
- Sorted list

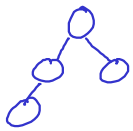
Shape Binary Tree

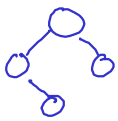
Shape

Complete Binary Tree

all levels are full except the last, where all nodes are shifted to the left


complete


complete


not complete


not complete

Data

Max Heap

all nodes have children with priority ≤ this node's priority

Data

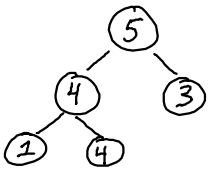
BST

at all nodes
left desc. < key
right desc. > key

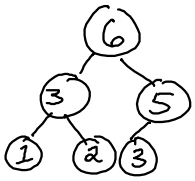
Data

AVL

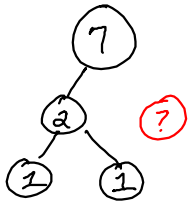
at all nodes,
height left subtree & height right subtree differ by at most 1



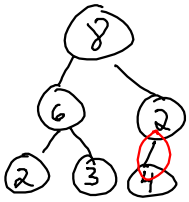
Max heap



Max heap



Not a max heap
(not complete)



Not a max heap
4 ≰ 2

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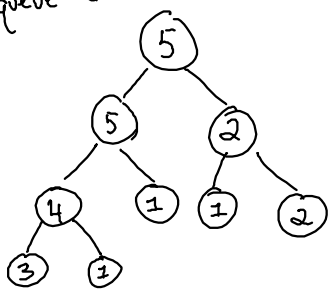
enqueue 6



If I know # nodes, then I know where to put next node.

enqueue

1. Put new priority in that spot.
2. Consider swapping w/ parent recursively — bubble-up

dequeue

1. Swap root contents w/ last node's contents
2. Remove last node
3. Consider swapping w/ biggest child recursively — bubble-down

maintain completeness and max-heap