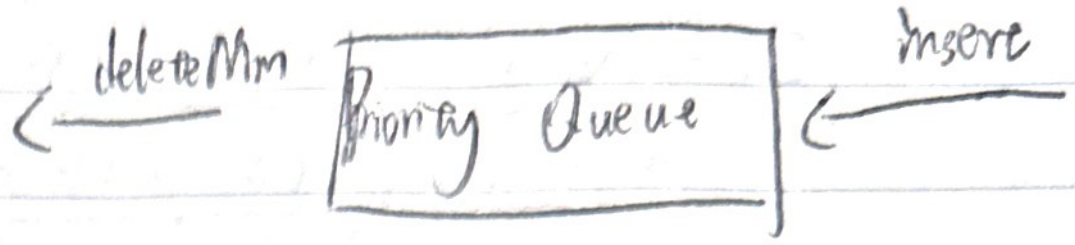
Heap (Priority Queue)

operation :

insert (enqueue)

deleteMin (dequeue)



- Small value higher priority
- Find / save min element, delete from structure and return it

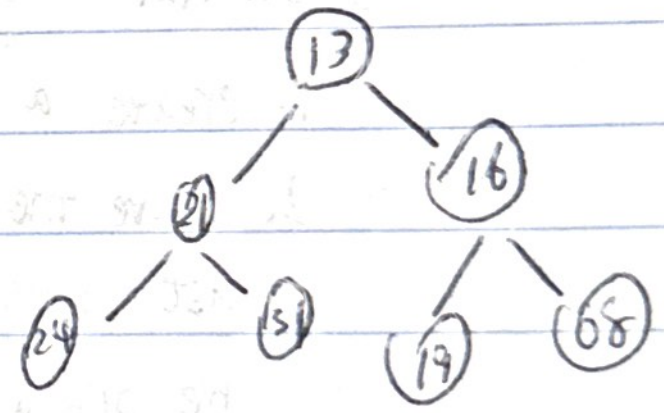
	Insert	DeleteMin
Unsorted Linked List	O(1)	O(N)
Sorted Linked List	O(N)	O(1)
Binary Search Tree	O(logN)	O(logN)

Complete Tree

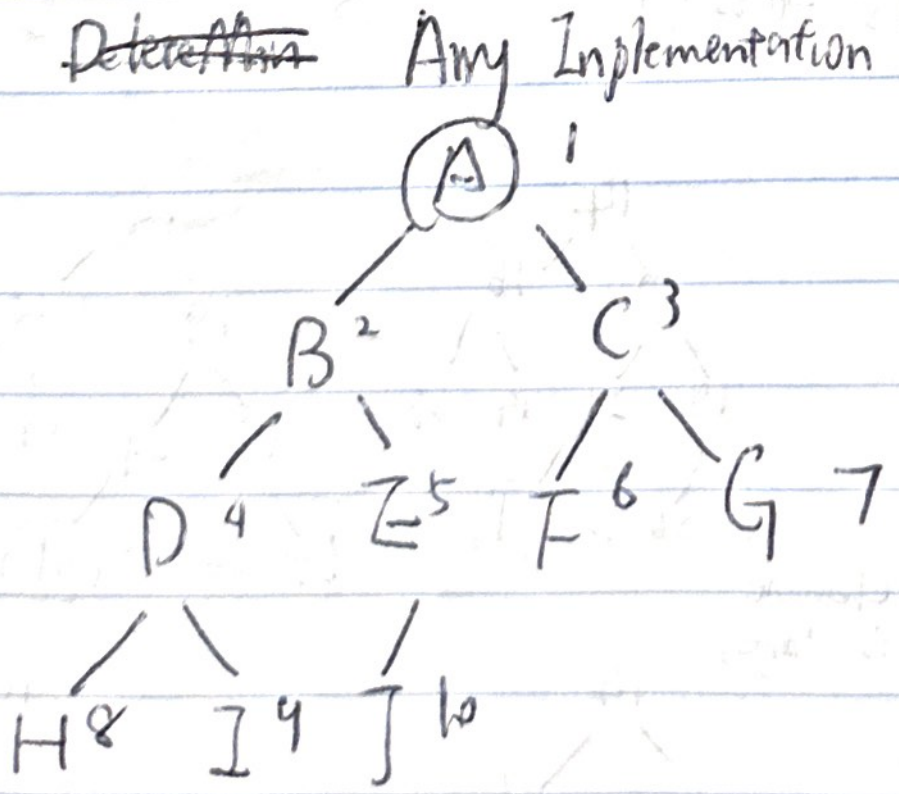
- completely filled
- size between 2^n and $2^{h+1}-1$

Heap (minimum) 最小堆

- Any node is smaller than any children
- Smallest value at root (findMin take O(1) time)



~~DeleteMin~~ Array Implementation of Binary Heap



left Child pos = ~~parent pos · 2~~

right Child pos = ~~parent pos · 2 + 1~~

parent pos = $\frac{\text{child pos}}{2}$ 去掉小数部分

definition : Array of Node

	A	B	C	D	E	F	G	H	I	J
0	1	2	3	4	5	6	7	8	9	10