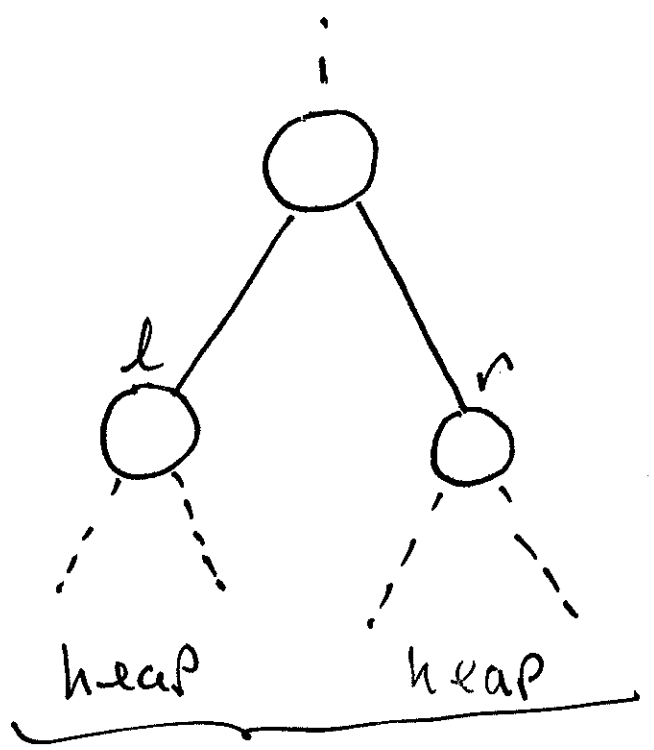


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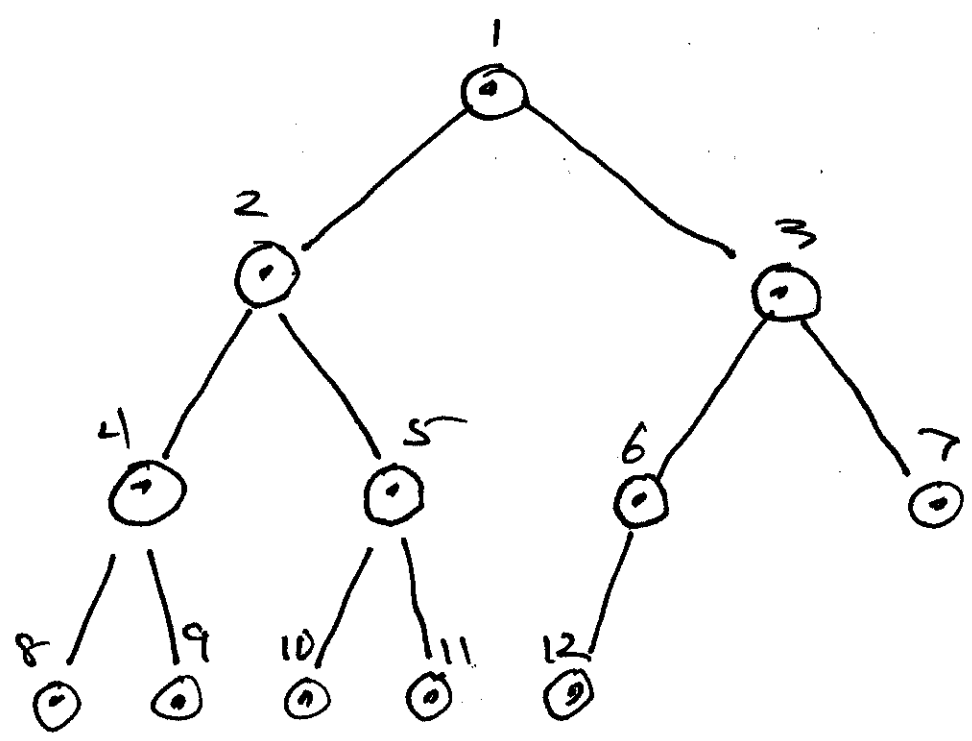
- Pass: ext. 2 more days (last)
to Fri. 10 PM.

6.2 + heapify

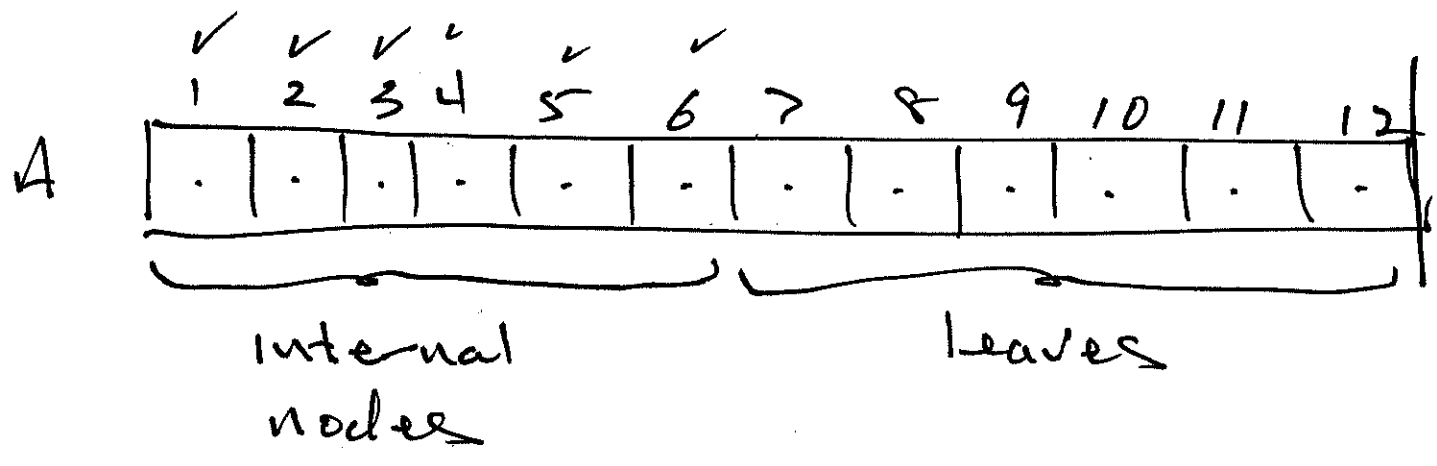


Precondition to heapify

6.3 Build Heap



$\sqrt{12}$



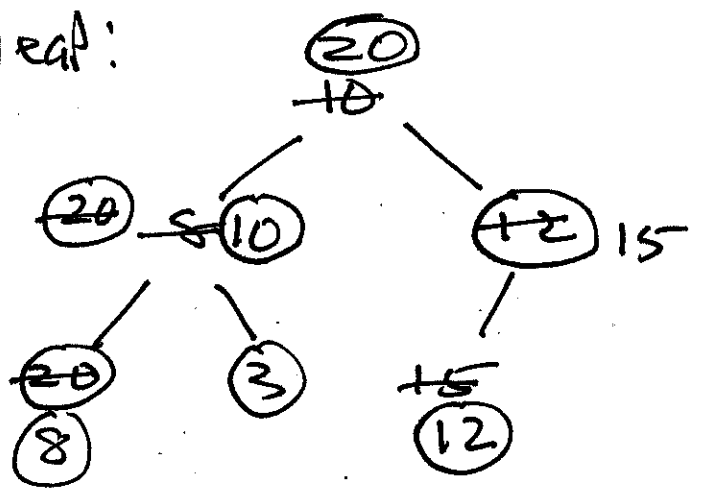
Runtime: $\Theta(\log n)$

6.4 Heapsort

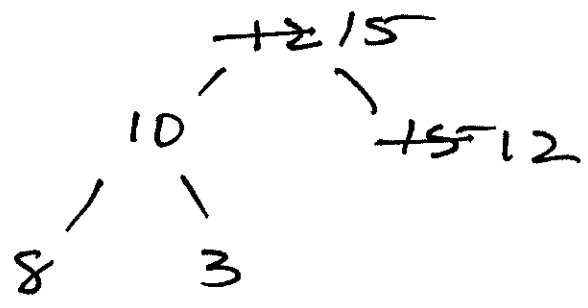
Ex:

1	2	3	4	5	6
10	8	12	20	3	15

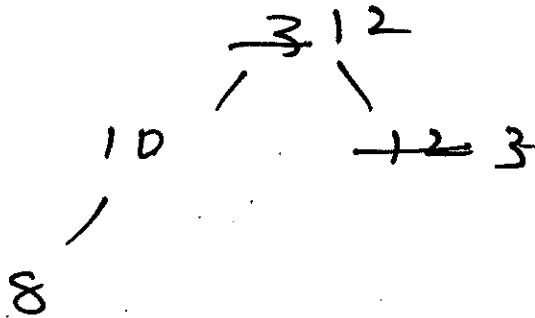
Build Heap:



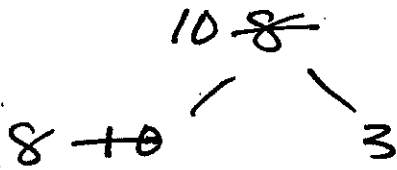
1	2	3	4	5	6
20	10	15	8	3	12
12					20



1	2	3	4	5	6
15	10	12	8	3	20
				15	



1	2	3	4	5	6
2	10	3	8	15	20
8			12		



2	8	3	12	15	20
3		10			

3 8
8 3

8	3	10	12	15	20
3	8				

3

1	2	3	4	5	6
3	8	10	12	15	20

Runtime : $\Theta(n \log n)$

6.5 Priority Queues

- $\text{HeapMaximum}(A)$: Pre $\text{heapSize}[A] \geq 1$
runtime: $\Theta(1)$
- $\text{HeapDeleteMax}(A)$: Pre $\text{heapSize}[A] \geq 1$
runtime: $\Theta(\log n)$
- HeapExtractMax : Pre $\text{heapSize}[A] \geq 1$
runtime: $\Theta(\log n)$
- $\text{HeapIncreaseKey}(A, i, k)$: Pre $1 \leq i \leq \text{heapSize}[A]$
runtime: $\Theta(\log n)$
- $\text{HeapInsert}(A, k)$: Pre $\text{heapSize}[A] < \text{length}[A]$
runtime: $\Theta(\log n)$