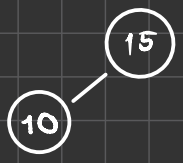
8. (2019)
The starting heap (tree form)

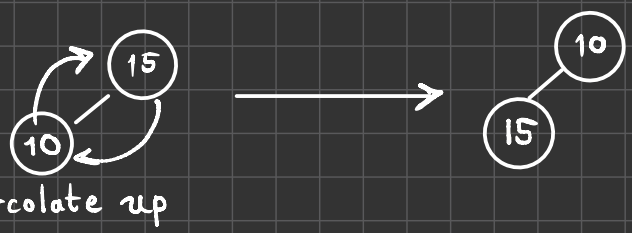
Add 10

Since this is a min-heap 10 must be above 15 so
First insert 10 into the last avaliable node



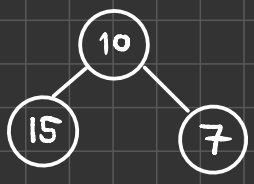
Note that I use only a single line to represent both node pointers this is for readability

Then percolate up 10 to maintain heap property, the resulting heap



Add 7

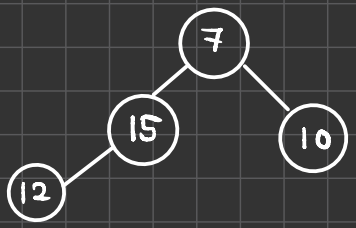
Since 7 is less than 10 do the same as add 10, First insert at last avaliable node



Then percolate up 7

Add 12

First insert 12 at last avaliable node

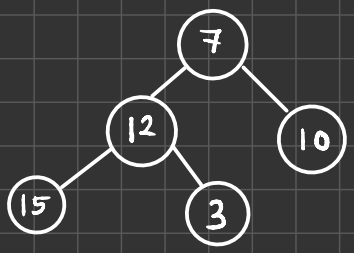


Then because 15 > 12 violates heap property perlocate up 12

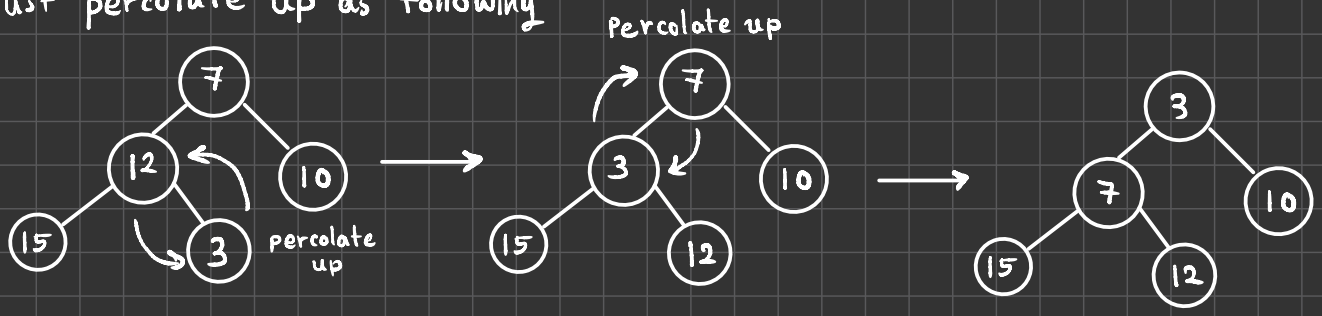
And since 7 < 12 12 is in the correct position

Add 3

First insert 3 at last avaliable node

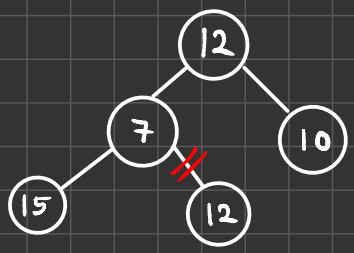


Since 3 < 12 and 3 < 7 this violate heap property
3 must percolate up as following

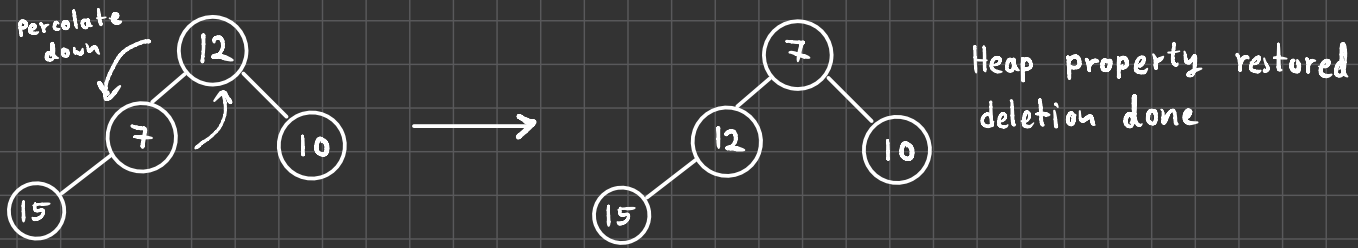


Remove most important value

In this case remove 3
First overwrite 3's node with the last data 12, then remove pointers of the last node (make 0 in array case)



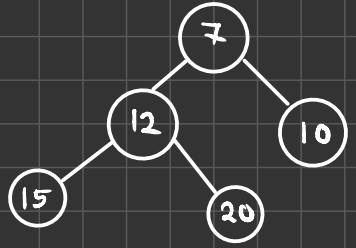
Then percolate down 12 until heap property is restored



Heap property restored
deletion done

Add 20

Add 20 to avaliable node

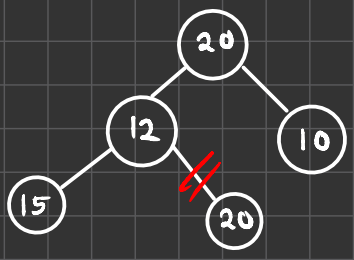


No heap property violated
Insertion done

Remove most important value

In this case remove 7

First overwrite 7 with last node 20 and delete connection of 20's node



Since 20 > 12 & 20 > 15 heap property is violated percolate down 20