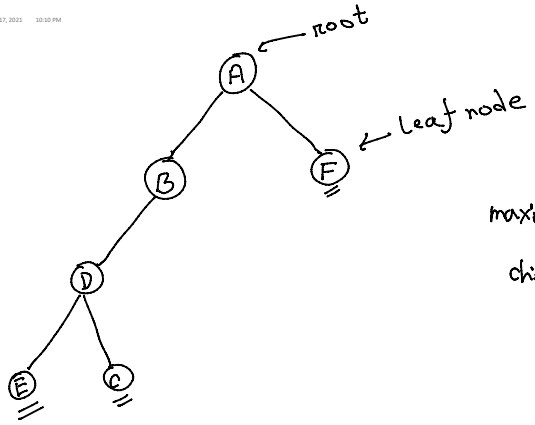
Class 10

Thursday, June 17, 2021 10:10 PM



Graph Theory

↳ Tree

↳ node

↳ edge

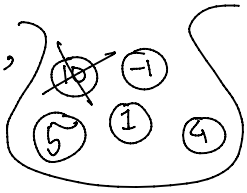
maximum 2 direct children

Node: N

Edge: N-1

5, 1, 4, 10, -1, 0,

7, 2



Binary Heap

getMax → O(1)

popMax → O(log N)

insertion → O(log N)

getMax() → O(1)

popMax() → O(1)

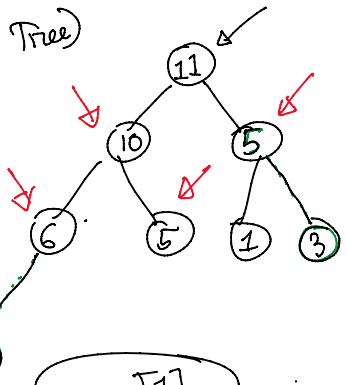
insert(v) → O(N)

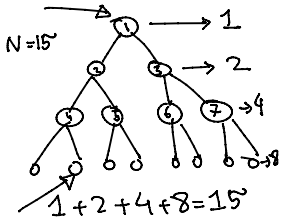
$2^4 - 1 = 16 - 1 = 15$

insert(5)

insert(11)

Binary (Binary Tree) Heap



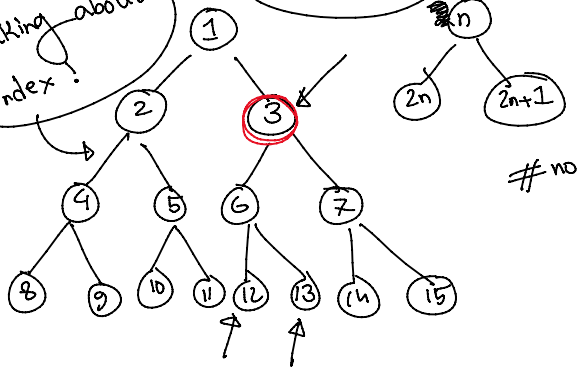


$1 + 2 + 4 + 8 = 15$

$2^0 + 2^1 + 2^2 + 2^3 = 2^4 - 1$

Talking about index!

arr[1]



$N = 15 = 2^h - 1$

$h = 4$

node $N = 2^h$ ← height

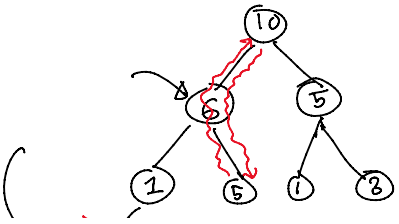
$\Rightarrow \log_2 N = \log_2 2^h$

$\Rightarrow \log_2 N = h \cdot \log_2 2$

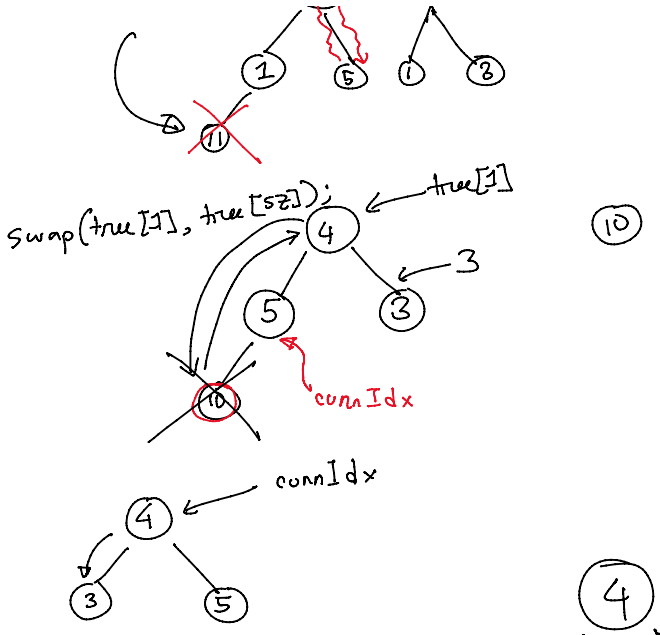
$\therefore h = \log_2 N$

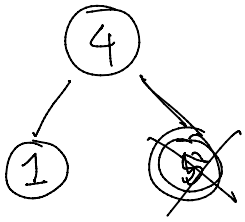
size = 7

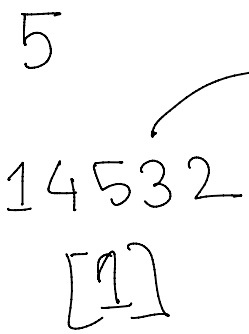
Pop

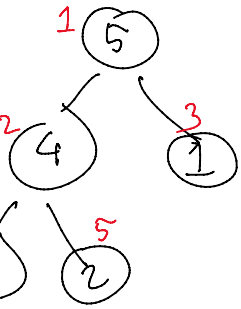


h h

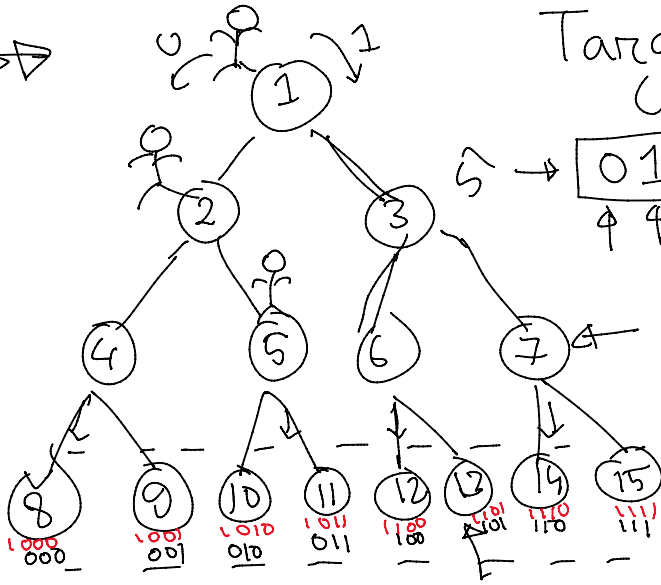

swap(tree[1], tree[sz]);
tree[1]
3
connIdx
connIdx




5
14532
[1]




14536
[2]
5 4 1 3 2


Targ
5
01

$et = 5$

$7 \to 11$