8.00 am for i=2 to 7
do C[i] = C[i] + C[i-1]

8.30 C — (n+k) times

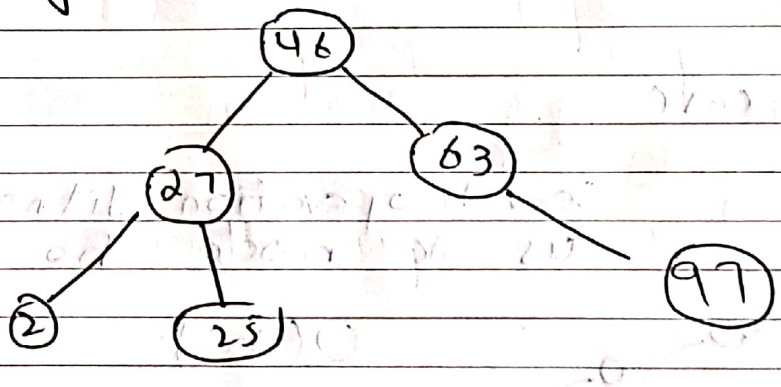
9.00 Binary Tree and Red black Tree

9.30 lecture #10

10.00 Binary Tree

- unique value

10.30



11.00

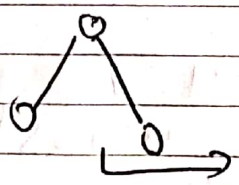
11.30

Noon

12.30 In-order -Travel

1.00 └→ give us Sorted Array

1.30

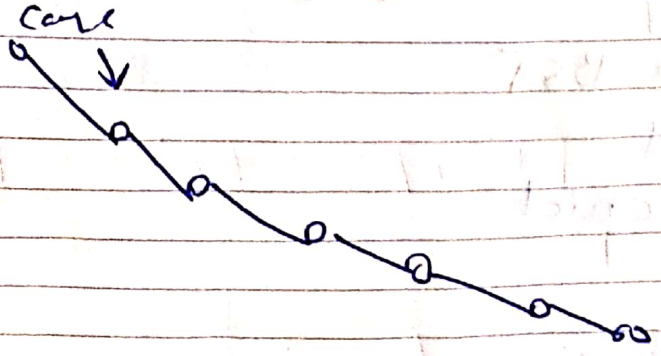


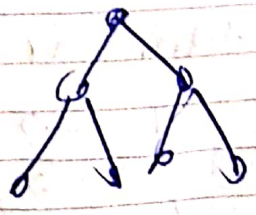
2.00 twice recursively

2.30 because of n node and twice recursival and fixed here then Θ(n)

3.00 wrost case

3.30





4.00

4.30

5.00

6.00 pm

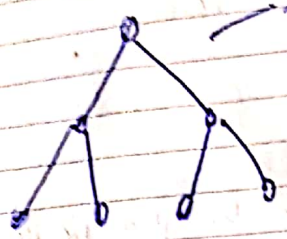
June

29 Thursday

Search operation par jitni us ki Height ho ghi

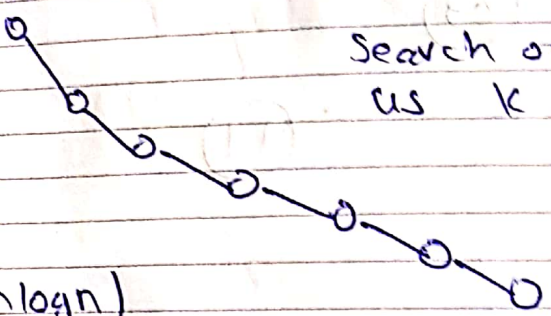
worst case → best case

$O(\log n)$ X



search operating take the time $O(n)$

incase worst case



Search operation jitna us k node ho ghy

$O(n)$

$O(n \log n)$

Insert

If we insert (E M O P T U

then your will have the worst balance tree

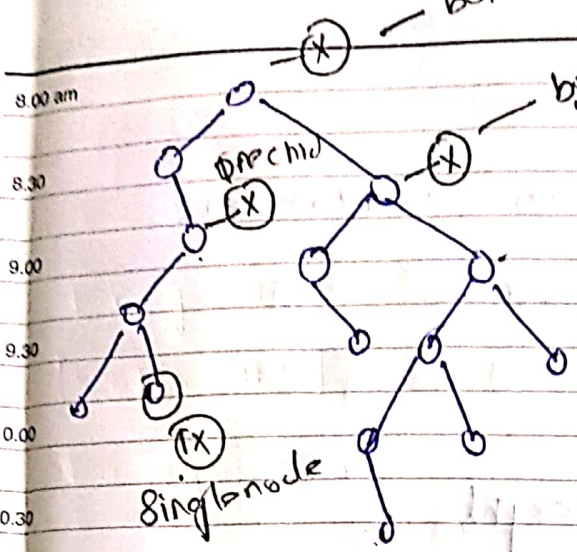
↳ that will create a free like linked list and that $O(n)$

Deletion From a BST

→ leaf

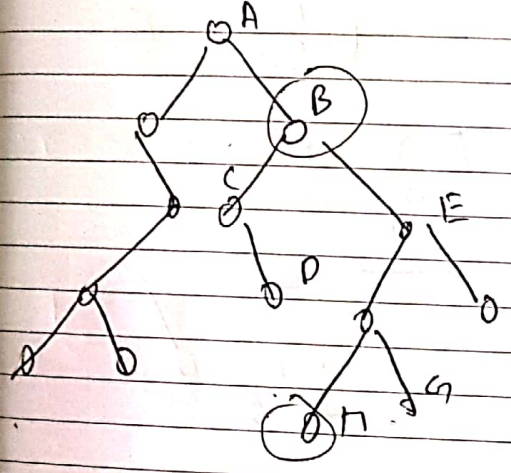
→ one child

Two child



Y — leaf
X → left child (one child)
X → both child

Second case
↳ where we have one child
third case
↳ both child



If want to delete the B then we replace with successor.
Here H is successor

O(h)

Because in BST have worst case which similar to the linked list in order to Handle the worst case we learned the AVL.

1 Saturday 182/183

8.00 am Red - black Tree

8.30 ↳ Take O(log n) in worst case

9.00 Define

↳ five step

9.30

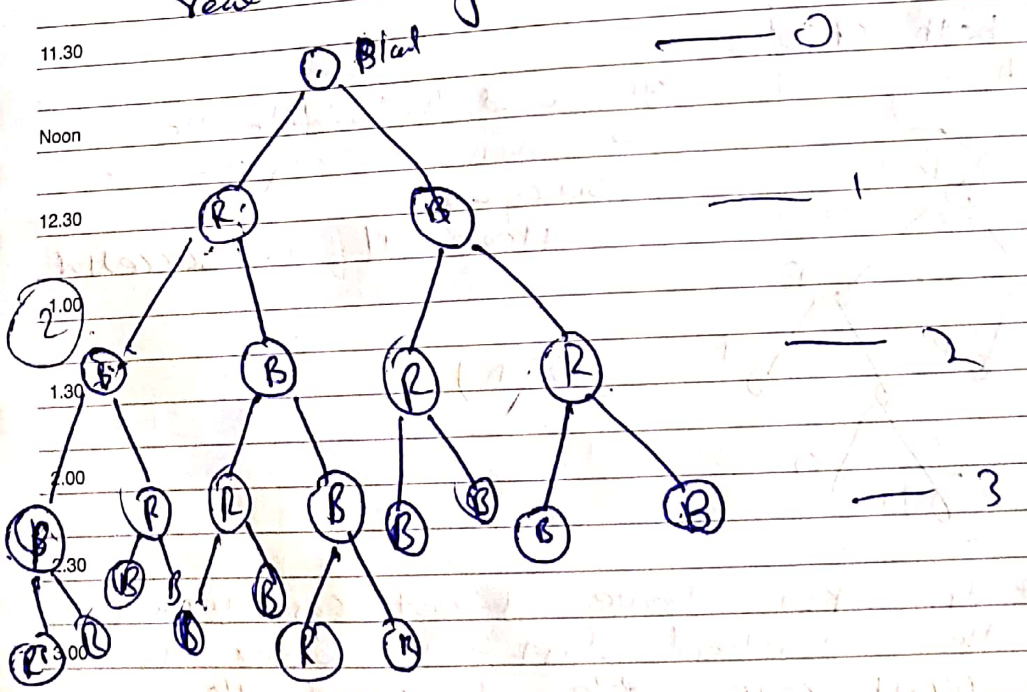
10.00 Black Height ???

10.30 Height & Red black Height

Black Height may be Half of the

11.00 real Height

11.30



Noon

12.30

1.00

1.30

2.00

2.30

3.00

3.30 What is the minimum of B-H of node

with height h?

4.00

4.30

5.00

6.00 pm

8.00 am

Theorem :

A Red black tree with n internal nodes has height $h \leq 2 \log(n+1)$

(internal nodes does not include leafs.)

① Define

$F(n) \leq (g(n))$

$n \leq 2 \log(n+1)$

height

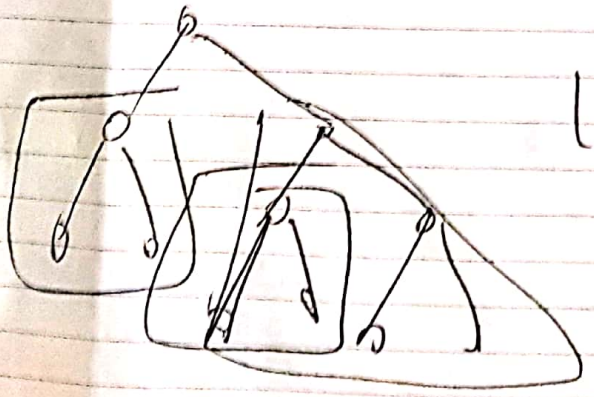
$2^{(1)} - 1 = (1)$

Atleast one node $= 2^1 - 1 = 1$

$2^1 - 1 = 1 \Rightarrow$ Atleast these node in tree

$2^2 - 1 = 3 \rightarrow$ //

$2^0 - 1 = 0 \rightarrow$ 0 internal nodes (True)



$\lfloor 2^{bh(u)} - 1 \rfloor + (2^{bh(u)} - 1) + (1)$

Root

Scanned with CamScanner

July
WEEK 27

May 2017

M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June 2017

M	T	W	T	F	S	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

July 2017

M	T	W	T	F	S	S
31					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

3 Monday

8.00 am

Online Class

8.30

Best case → CBT

9.00

Worst case → Like linked list

9.30

AVL Similar to Red Black Tree

10.00

10.30 Theorem

Nill external node
other internal node

11.00

$n \leq 2(\log(n+1))$

11.30

$\log_2(n+1) \geq \log_2^{n/2}$

Noon

$\log_2(n+1) \geq n/2$

12.30

1.00