

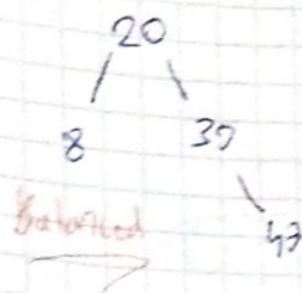
Q1

AVL Visualizations

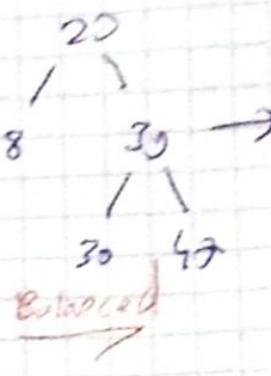
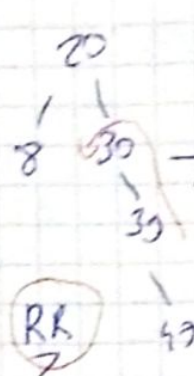
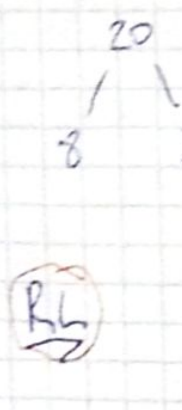
1801042669

Bogdan Erin Gilmut

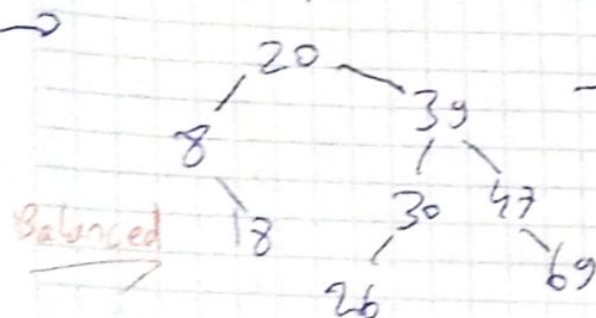
AVL insert 20, 30, 8, 47



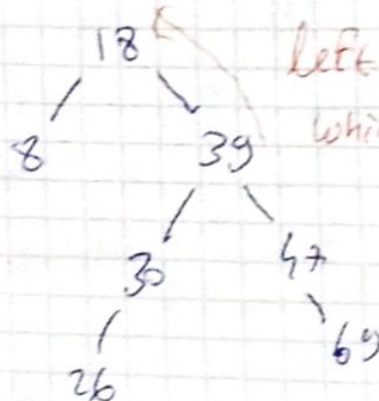
insert 30



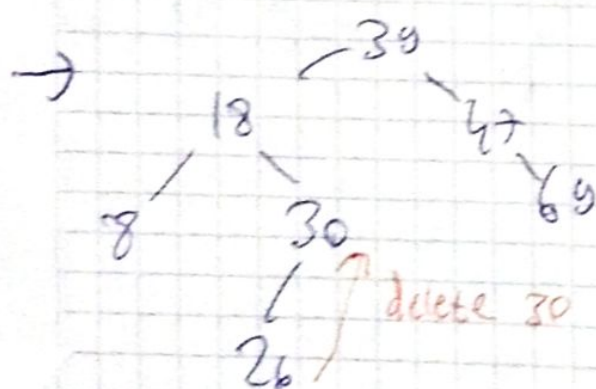
insert 18, 26, 69



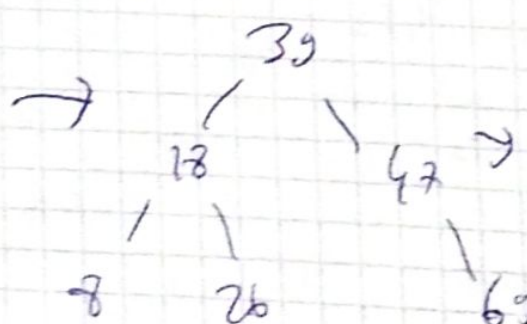
Delete 20

Left max goes to top
which is 18

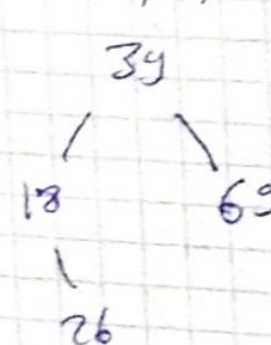
Rebalance



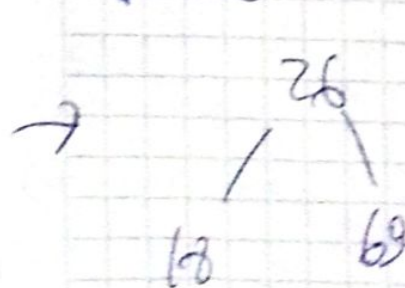
Delete 30



Delete 8, 47



Delete 30

Left max goes top
which is 26

Delete 18, 26

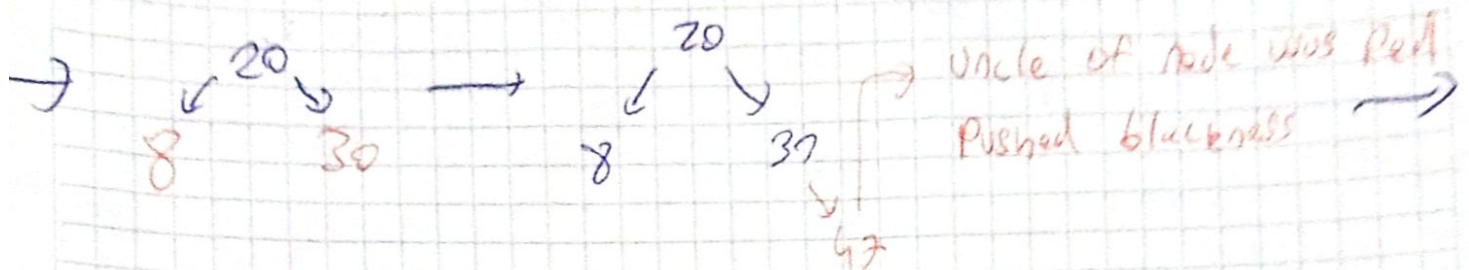


Q1 Red Black Tree Observations

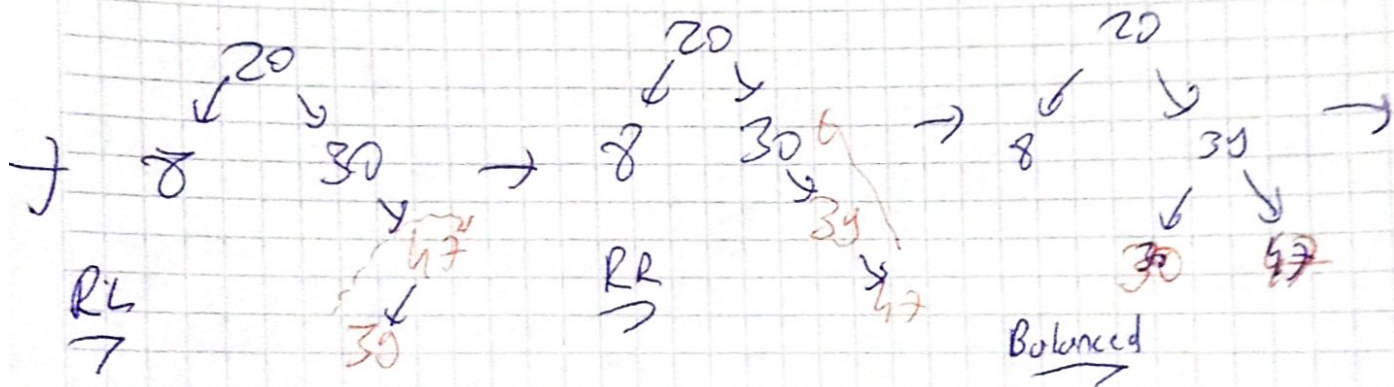
18/10/26/69
Bigen Eray Yilmaz

● → Black
● → Red

RB1 insert 20, 30, 8 insert 47

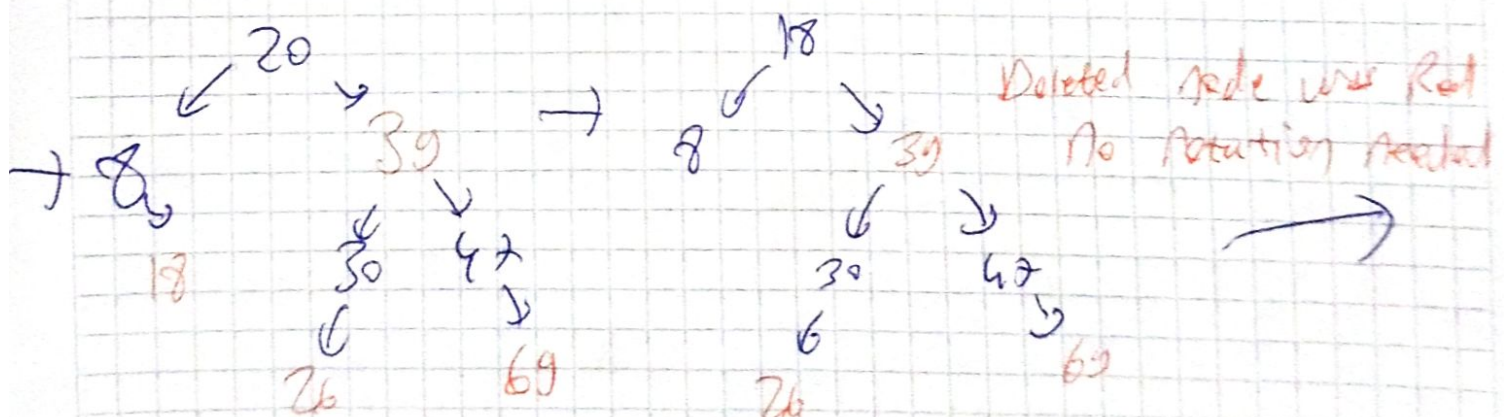


insert 39



insert 18, 26, 69

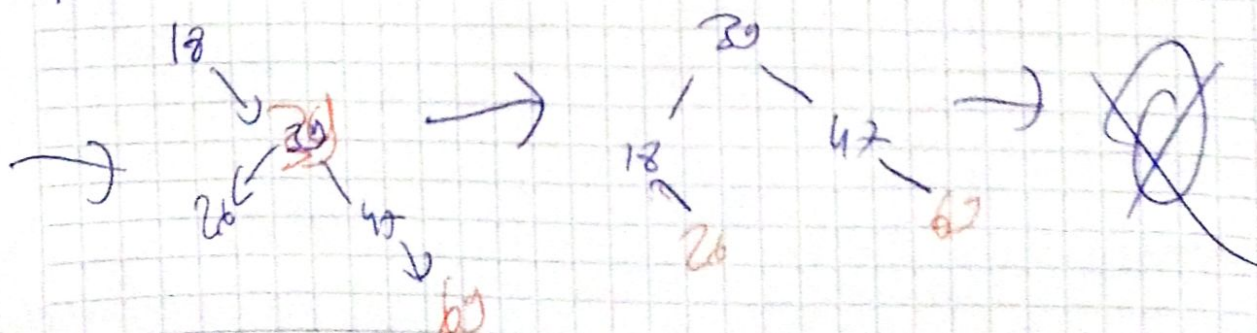
delete 78



delete 30, 8

Rebalance

Remove Root



Q1

2-3 Tree

1801042669

Bhram Enn Viliw

Insert 20, 30

[20 30]

Insert 8

[8 20 30]

Split

20
/ \
8 30

Insert 47

20
/ \
8 [30 47]

Insert 39

20
/ \
8 [30 39 47]

Split

20
/ | \
8 30 47

Insert 18, 26, 69

[20 30]

[20 30]
/ | \
[8 18] [26 30] [47 69]

Delete 20

[18 30]

[18 30]
/ | \
8 [26 30] [47 69]

Delete 30

[18 30]

[18 30]
/ | \
8 26 [47 69]

Delete 8

[18 30]

[18 30]
/ \
26 [47 69]

Merge Nodes

39
/ \
[18 26] [47 69]

Delete 47

[39]

[39]
/ \
[18 26] 69

Delete 39

26

[8]

Left with 26
comes to root

26
/ \
[8] 69

Delete 18

26

69

Merge

[26 69]

Delete Root

Skip List

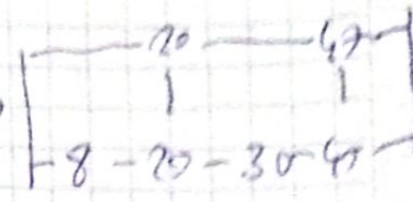
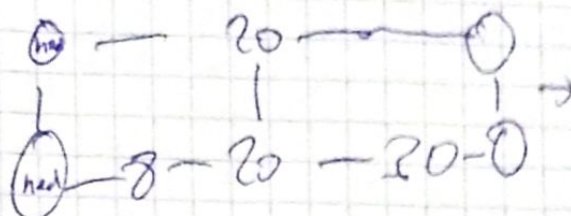
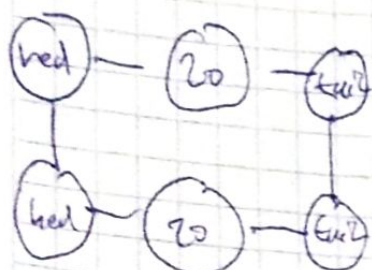
Buğru Eni yd/mz

Assume every 4th coin flip is free
1000 1000 1000

Insert 20 (1)

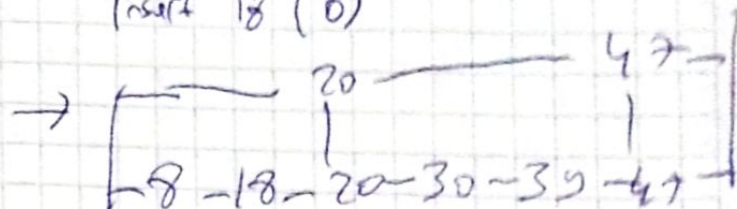
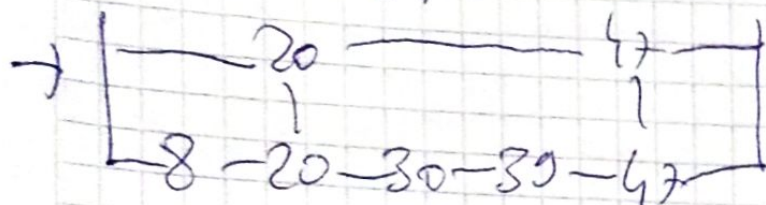
Insert 30, 8 (0, 0)

Insert 47 (1)



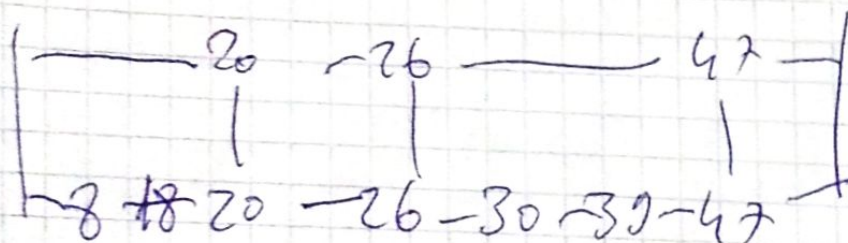
Insert 39 (0)

Insert 18 (0)

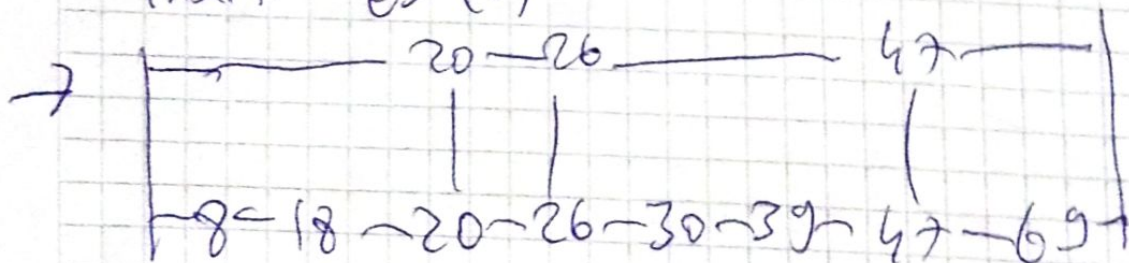


Present 26 (1)

Robert May



insert 69 (0)



Remove 20, 30, 8, 47, 39, 18, 26, 69



Remove from main lane and
Express lane if exists.

Q1

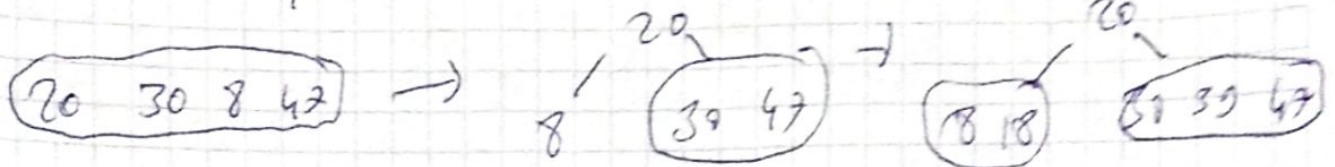
B-Tree with Order 4

1801042669

Bogran Erkan Yilmaz

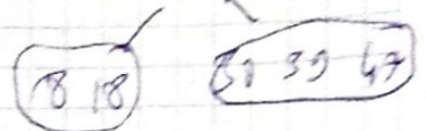
Insert 20, 30, 8, 47

Split



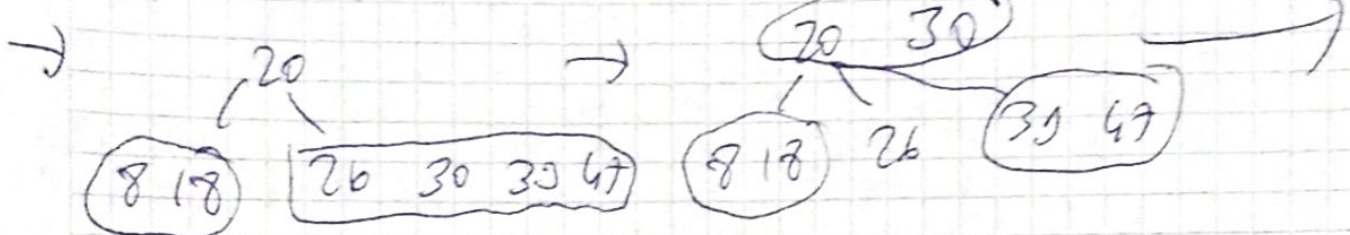
Insert 39, 18

20



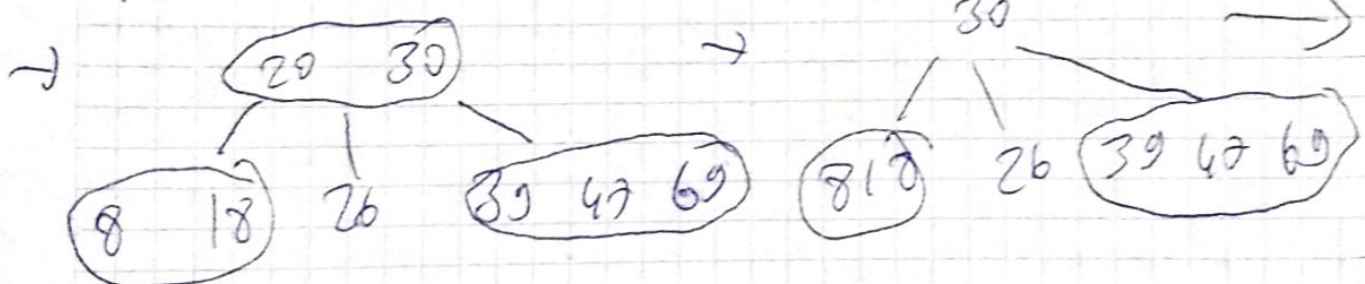
Insert 26

Split



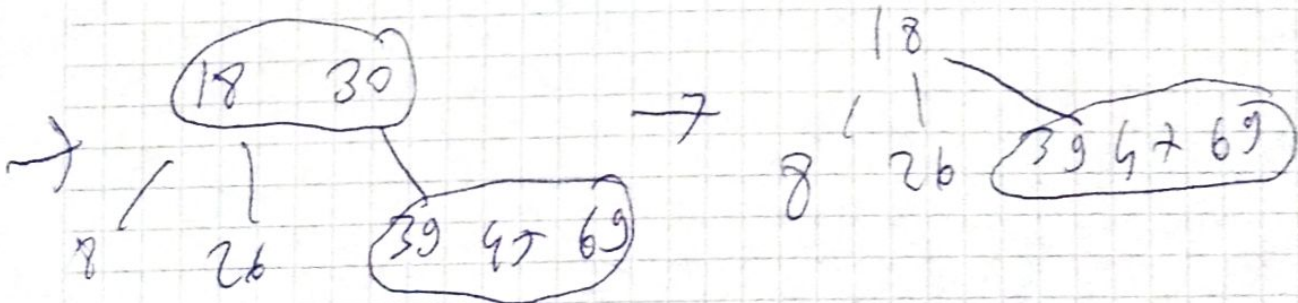
Insert 69

Delete 20



Left max moves up (18)

Delete 30



Right max moves up (39) Delete 8 and merge Delete Rest

