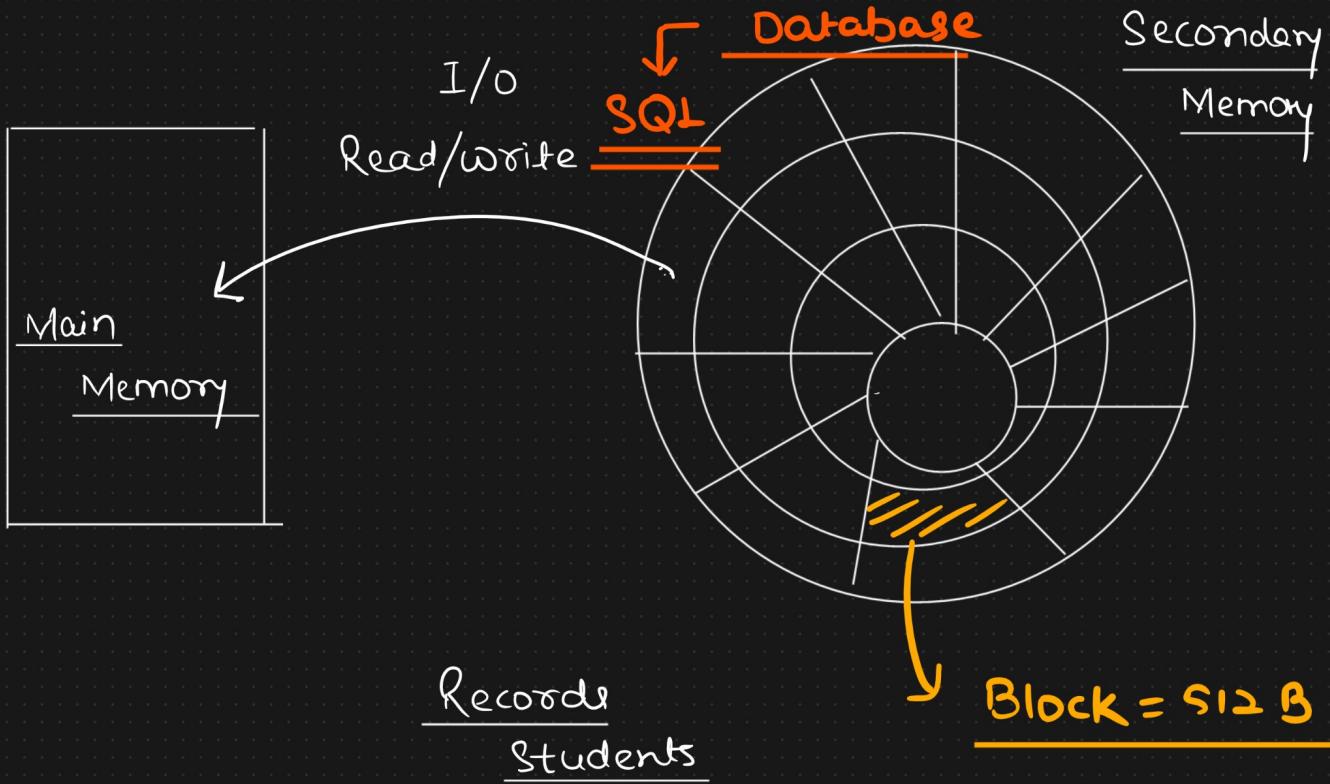


B & B+ Tree



features

1 - Sid	10B
Priya - Sname	50B
12th - Section	10B
Medcat - Sdept	8B
Delhi - Saddress	50B

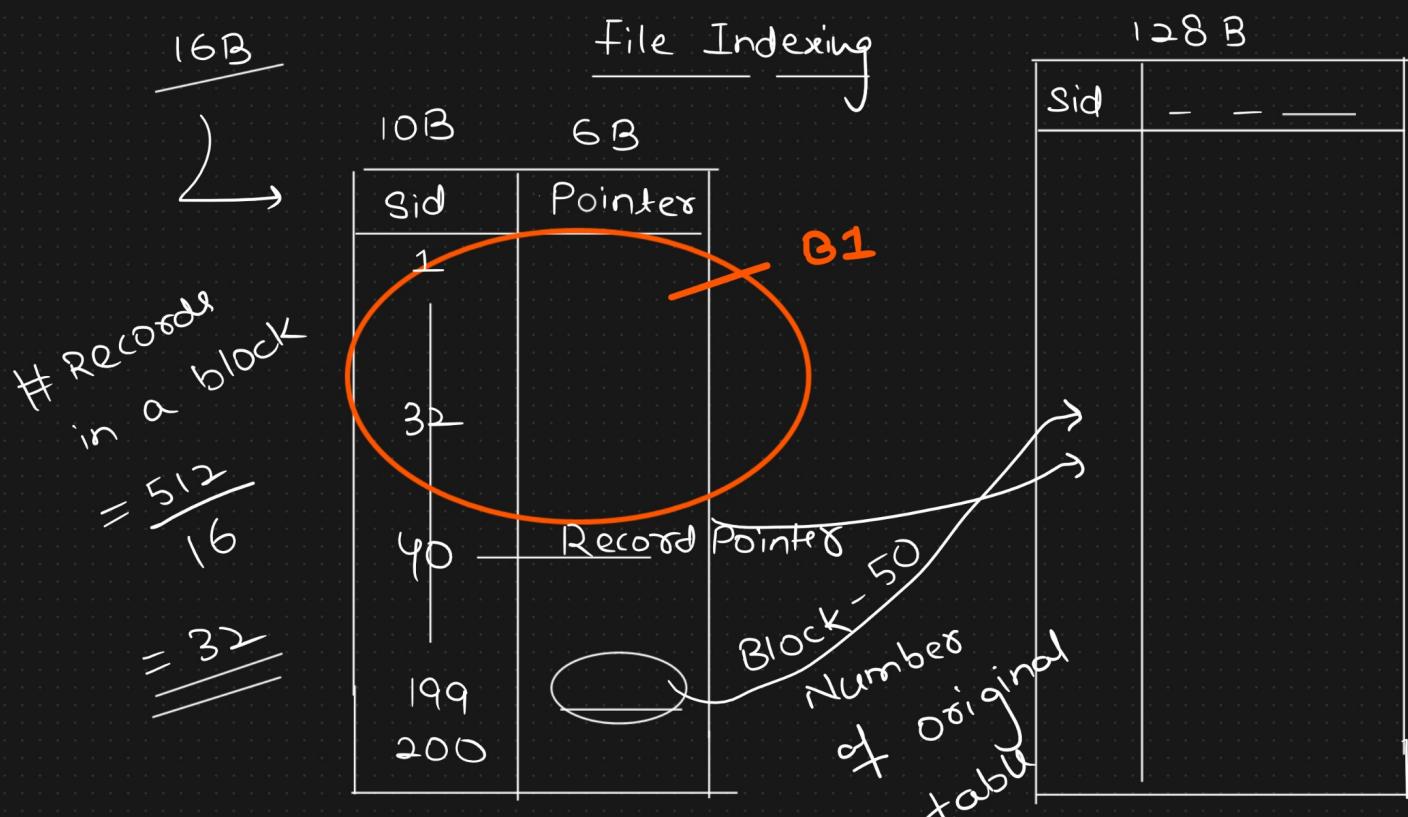
$$\begin{aligned} \# \text{ Records in a Block} \\ = \frac{512}{128} \quad 4 \text{ Records} \end{aligned}$$

128 B

Total Num of Records = 200

$$\begin{aligned} \# \text{ Blocks Requirement} = \frac{200}{50} \\ = 4 \end{aligned}$$

= 50



Total number of

$$\frac{\text{Blocks}}{\text{ }} = \frac{200}{32}$$

二

$$\underline{1} + \underline{1}$$

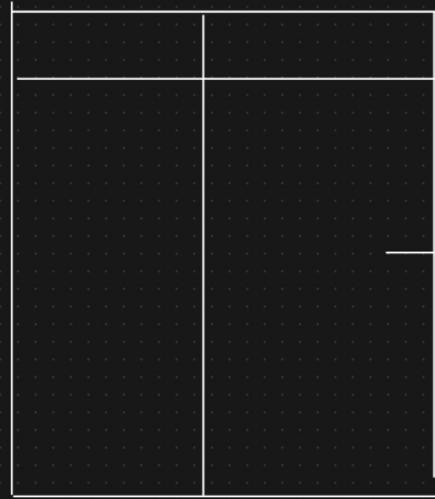
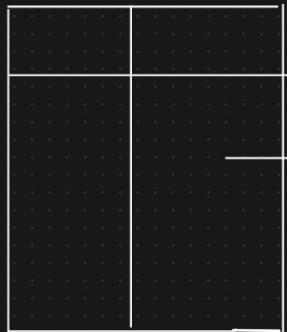
→ 2 Blocks

Multilevel Indexing

3

↳ factors 2 the search space

1

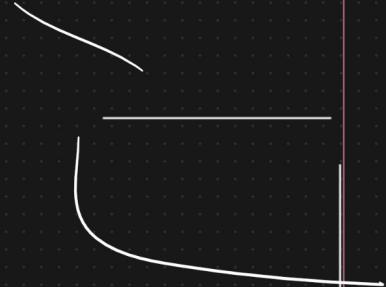
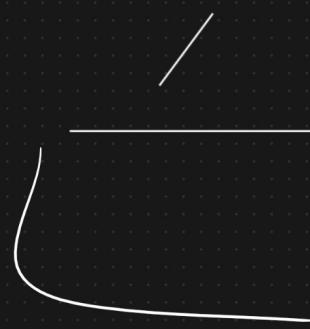


↳ H child

m-way search tree

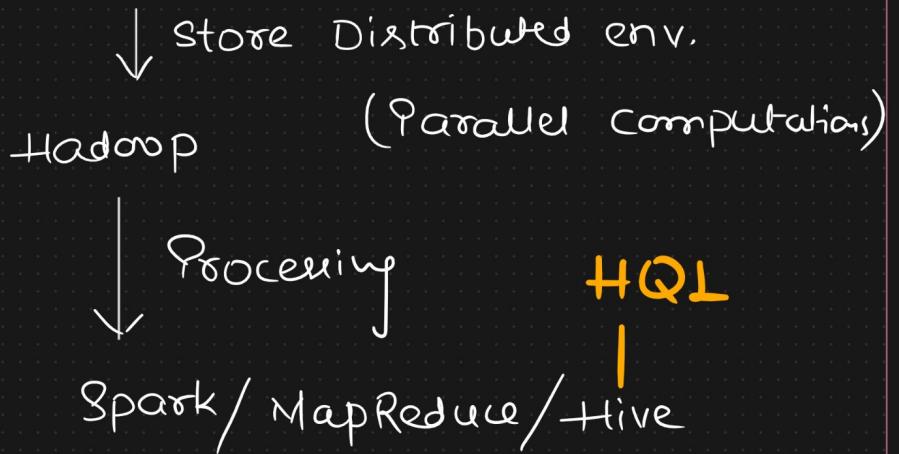
↳ NO proper guidelines

B-Tree ↘
B+ Tree ↘



Divide &
conquer

Big Data

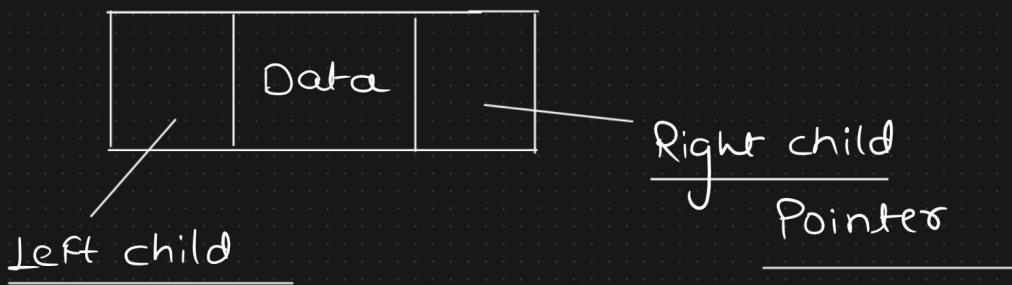


B-Tree

m /order → # child nodes

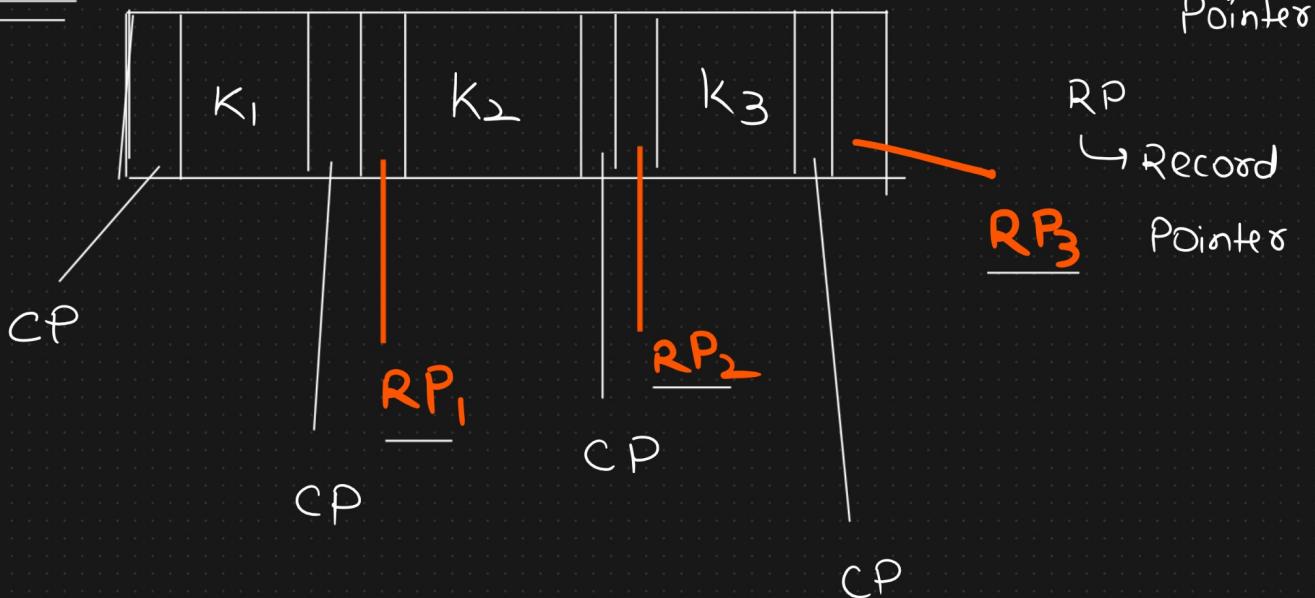
Node Structure

BST →



Pointer

→ $m = 4$ way search tree 3 keys



↳ m way search tree
↳ $(m-1)$ keys

↳ Root Node has two children

Internal nodes → $\lceil \frac{m}{2} \rceil$ nodes

↳ Insertion → Leaf Node

\leftarrow Left Part < Parent Node }
 Right Part > Parent Node }
 3-way search tree

$k_1 < k_2 < \dots < k_n$

$$m=3$$

(Keys = 1 to 10)

Step 1

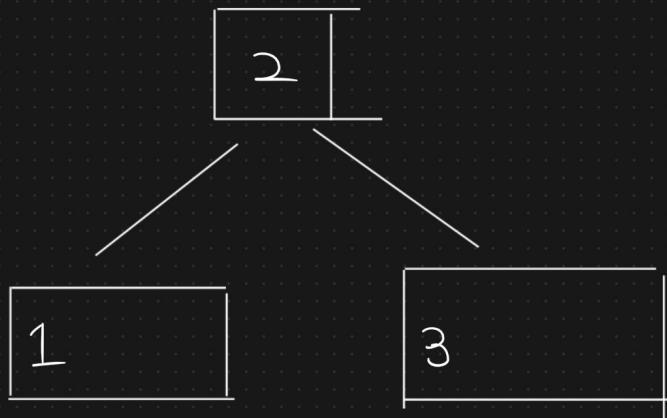


Step 2

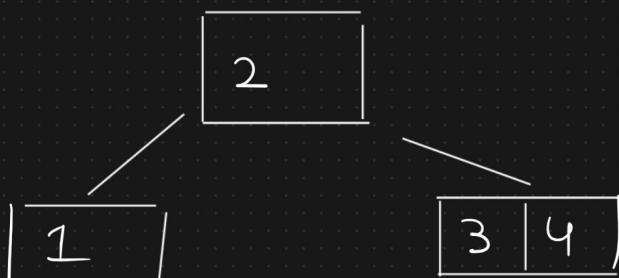


$$m=3$$

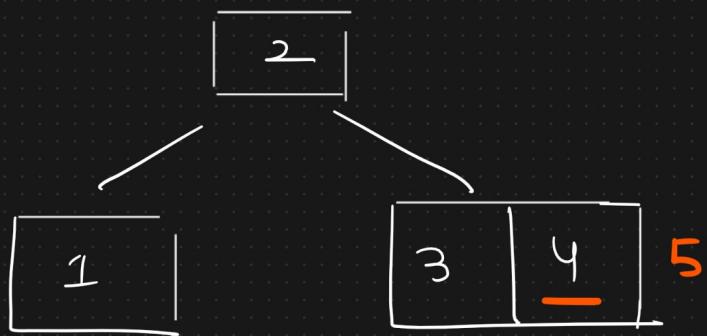
Step 3



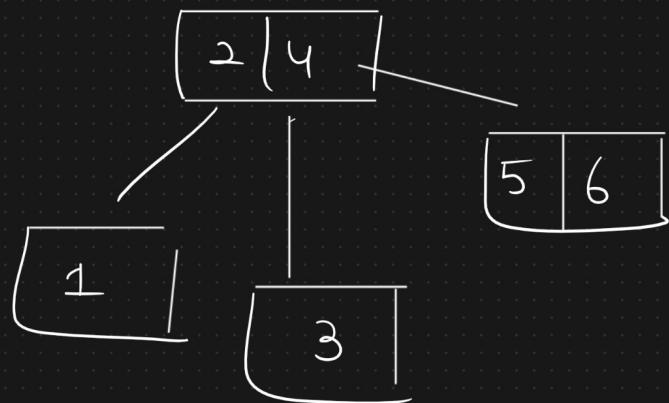
Step 4



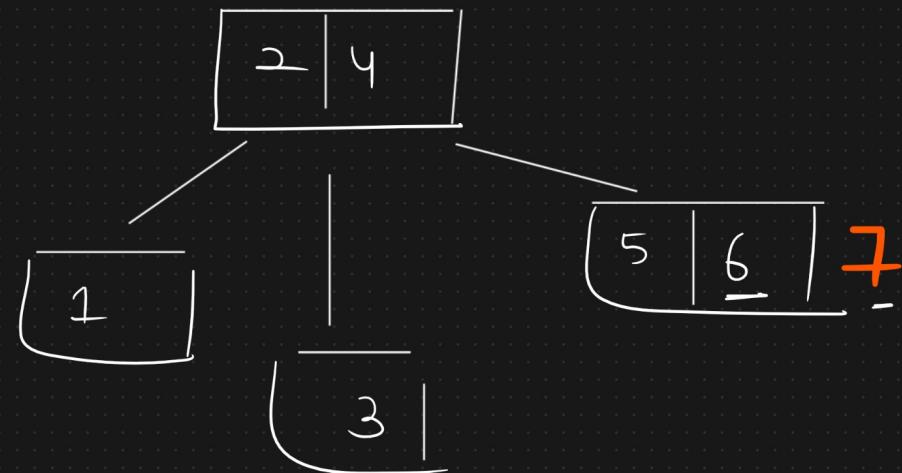
Step 5

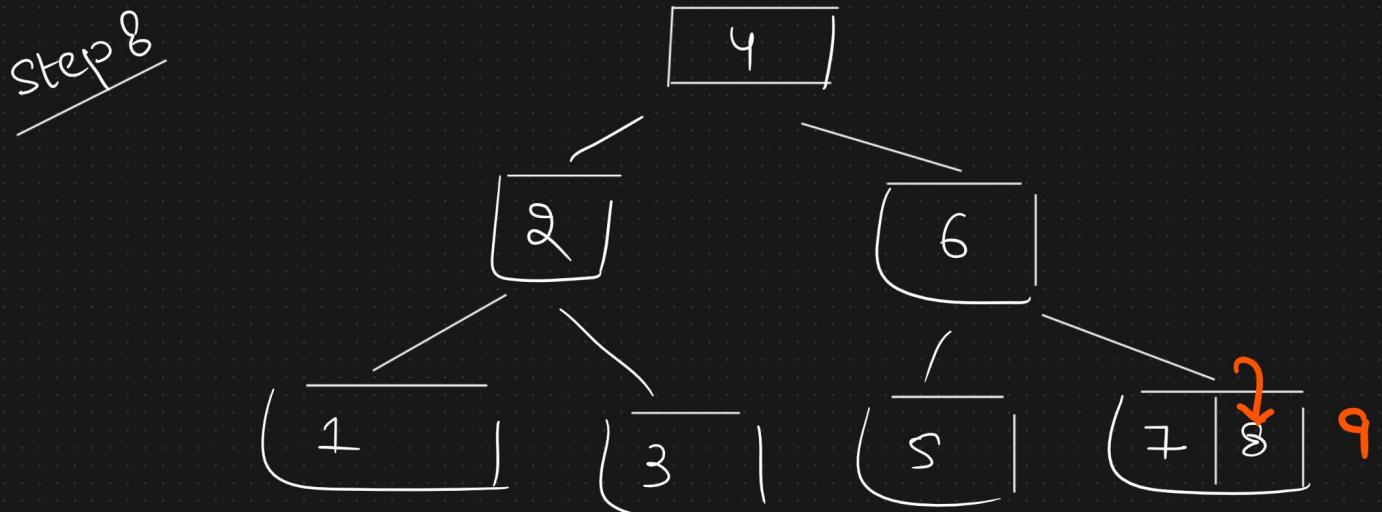
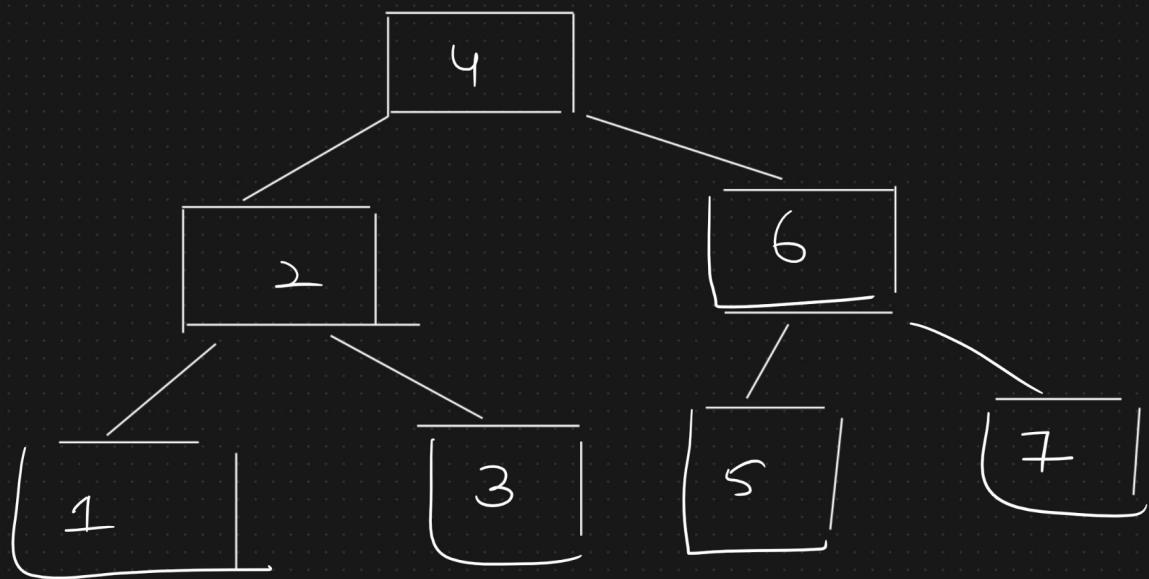
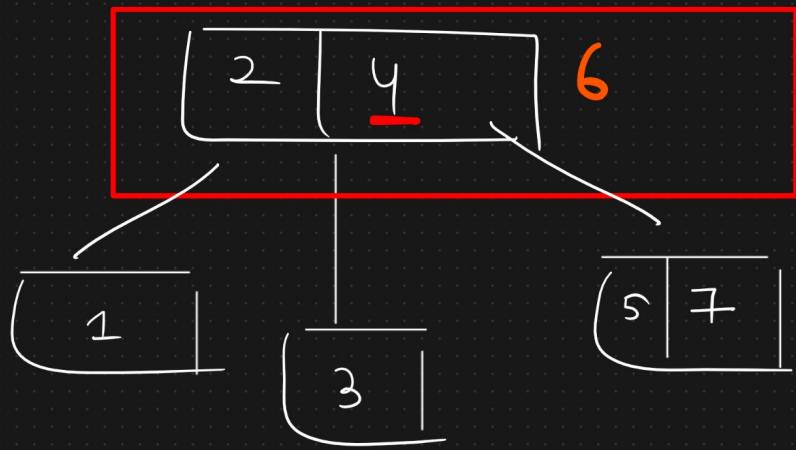


Step 6

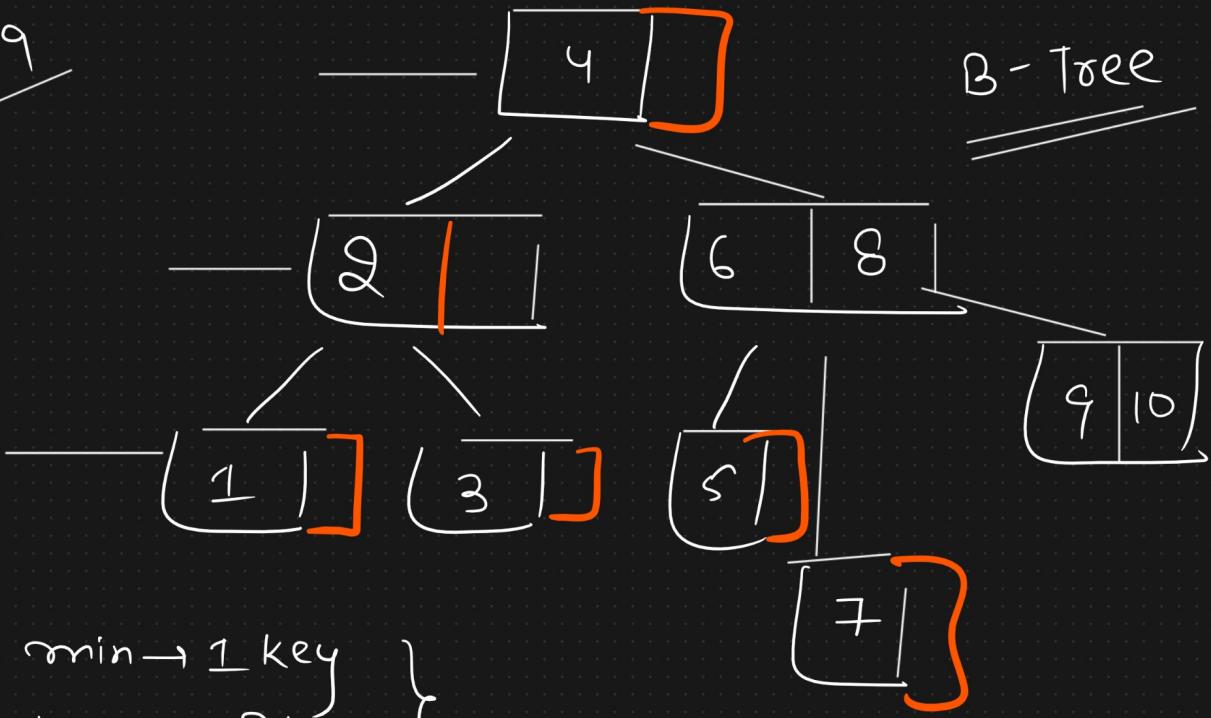


Step 7





Step 9



B - Tree

min → 1 key
max → 2 key

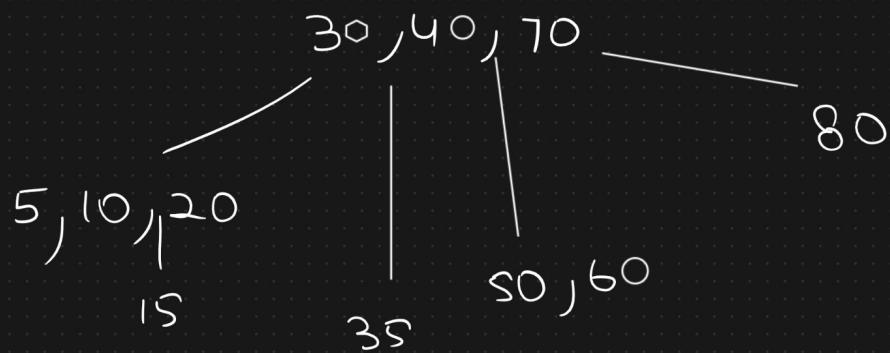
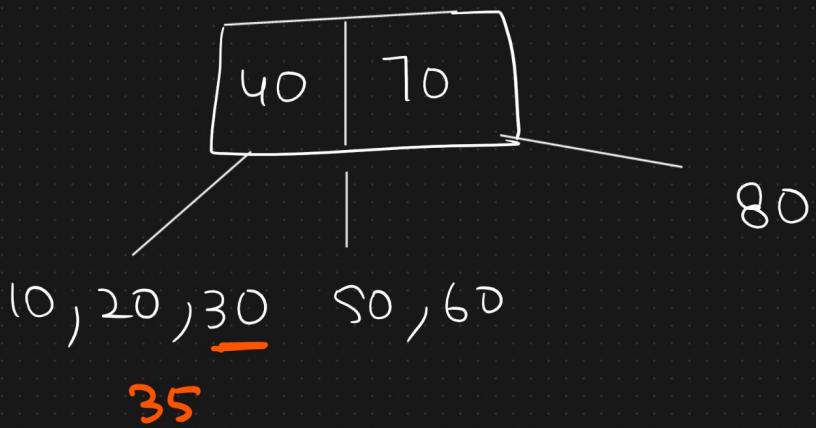
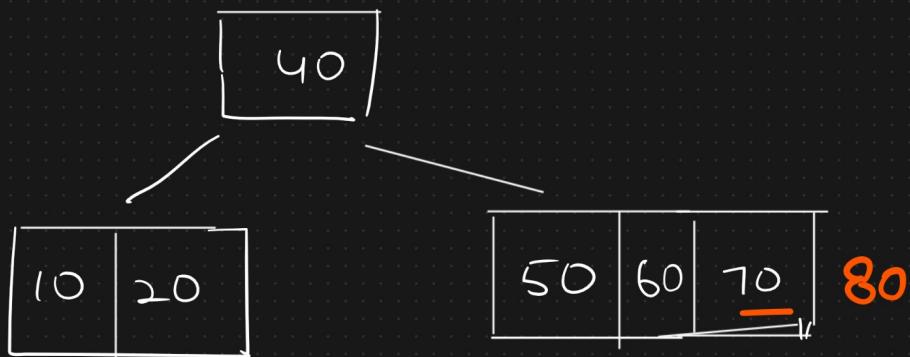
→ Leaf Nodes are at same Level

Task

$$m = 4$$

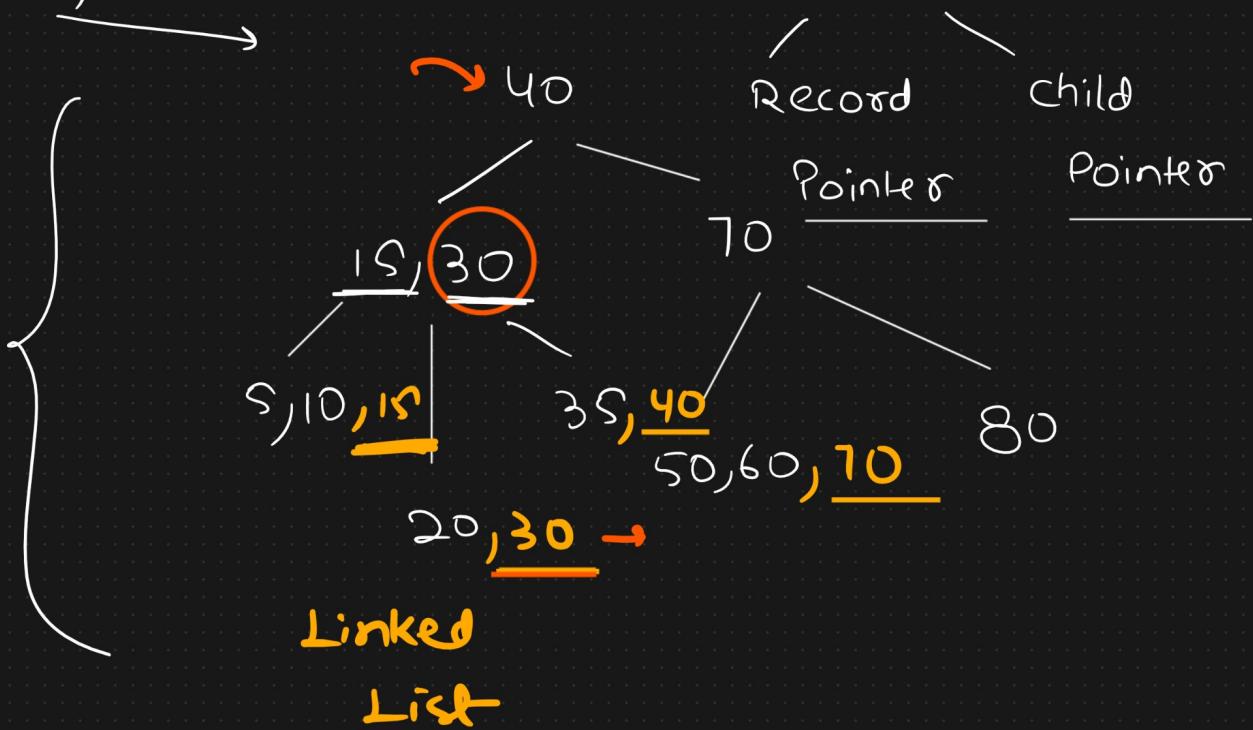
10, 20, 40, 50, 60, 70, 80, 30, 35, 5, 15

10	20	40	50
----	----	----	----



15, 30, 40, 70

Every node B-Tree have two pointers



B+ Tree

- All the Record pointers at Leaf Node.
- All the keys present at the Leaf Node
 - Duplicate entries

Leaf Node

Linked List

