



SNS COLLEGE OF TECHNOLOGY, COIMBATORE-35

(AN AUTONOMOUS INSTITUTION)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

19CST202-DATABASE MANAGEMENT SYSTEM

UNIT-V

PHYSICAL STORAGE AND MONGODB

Topic: B-Tree Index File

B tree:

A **B Tree** Index is a multilevel index.

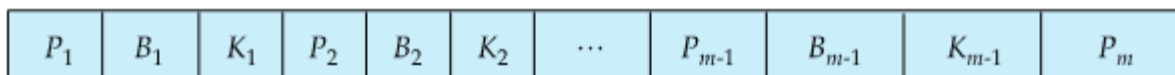
A **B Tree** is a rooted tree satisfying the following properties :

1. All paths from the root to the leaf are equally long.
2. A node that is not a root or leaf, has between $\lceil n / 2 \rceil$ and 'n' children.
3. A leaf node has between $\lceil (n-1) / 2 \rceil$ and 'n-1' values.

The structures of leaf, non-leaf nodes of this tree is :



(a)



(b)

Properties of B-tree

Following are some of the properties of B-tree in DBMS:

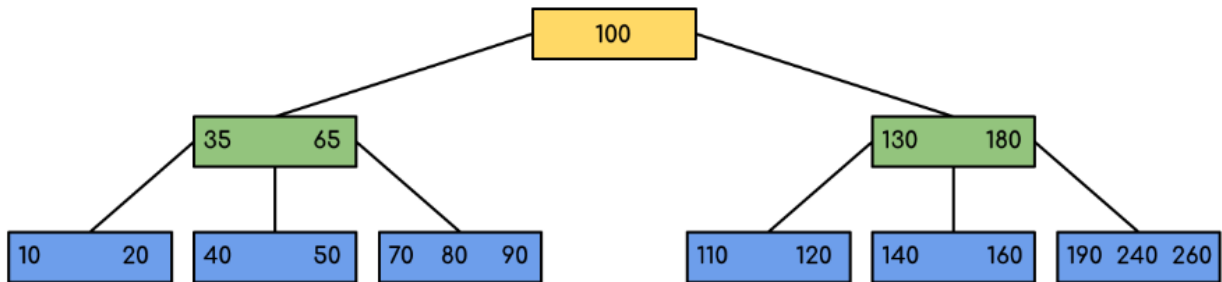
- A non-leaf node's number of keys is one less than the number of its children.
- The number of keys in the root ranges from one to (m-1) maximum.
Therefore, root has a minimum of two and a maximum of m children.

- The keys range from $\min(\lfloor m/2 \rfloor - 1)$ to $\max(m-1)$ for all nodes (non-leaf nodes) besides the root. Thus, they can have between m and $\lfloor m/2 \rfloor$ children.
- The level of each leaf node is the same.

Time Complexity of B-Tree:

Sr. No.	Algorithm	Time Complexity
1.	Search	$O(\log n)$
2.	Insert	$O(\log n)$
3.	Delete	$O(\log n)$

1.



Solution:

