



CS 400

B-Tree Insert

ID: 08-02

B-Tree Insertion

For a B-tree "of order **m**":

- All keys within a node are in sorted order.
(Note: These are two different meanings for the word "order".)
- Each node contains no more than **m-1** keys.
- Each internal node can have at most **m** children,
so a B-tree of order **m** is like an m-way tree.

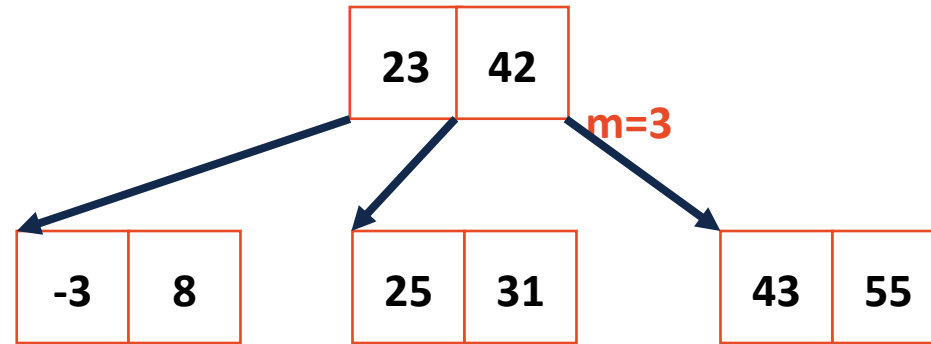


B-Tree Insertion

When a B-tree node reaches **m** keys:



B-Tree Recursive Insert



B-Tree Properties

For a B-tree "of order m ":

1. All keys within a node are in sorted order.
2. Each node contains no more than $m-1$ keys.
3. Each internal node has exactly **one more child than key**
(at most m children, so a B-tree of order m is like an m -way tree).
 - A root node can be a leaf or have **$[2, m]$** children.
 - Each non-root, internal node has **$[\text{ceil}(m/2), m]$** children.
4. All leaves are on the same level.

B-Tree

