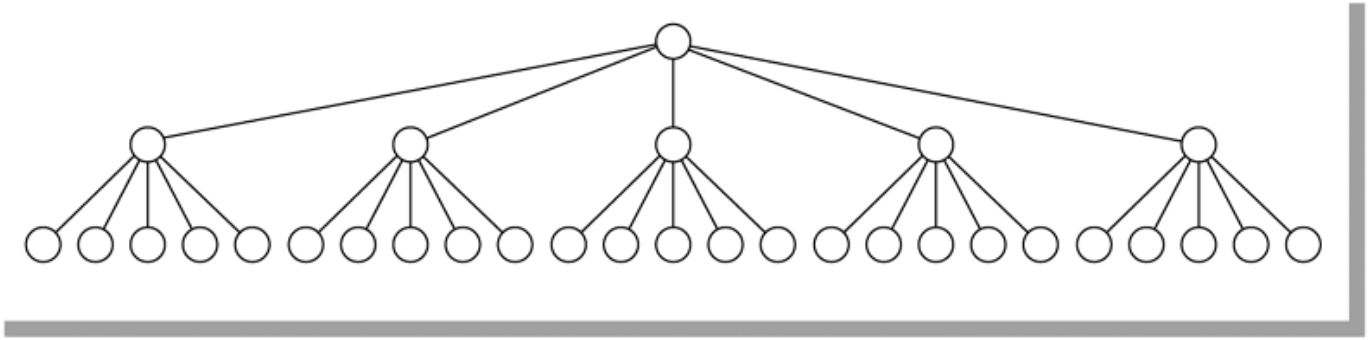

figure 19.83

A 5-ary tree of 31 nodes has only three levels

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Definition

- The data items are stored at leaves.
- The nonleaf nodes store as many as *M - 1* keys to guide the searching.
- Key *i* represents the smallest key in subtree *i* + 1
- The root is either a leaf or has between 2 and M children.

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Definition

- All nonleaf nodes (except the root) have between ceiling(M/2) and M children.
- All leaves are at the same depth and have between ceiling(L/2) and L data items, for some L

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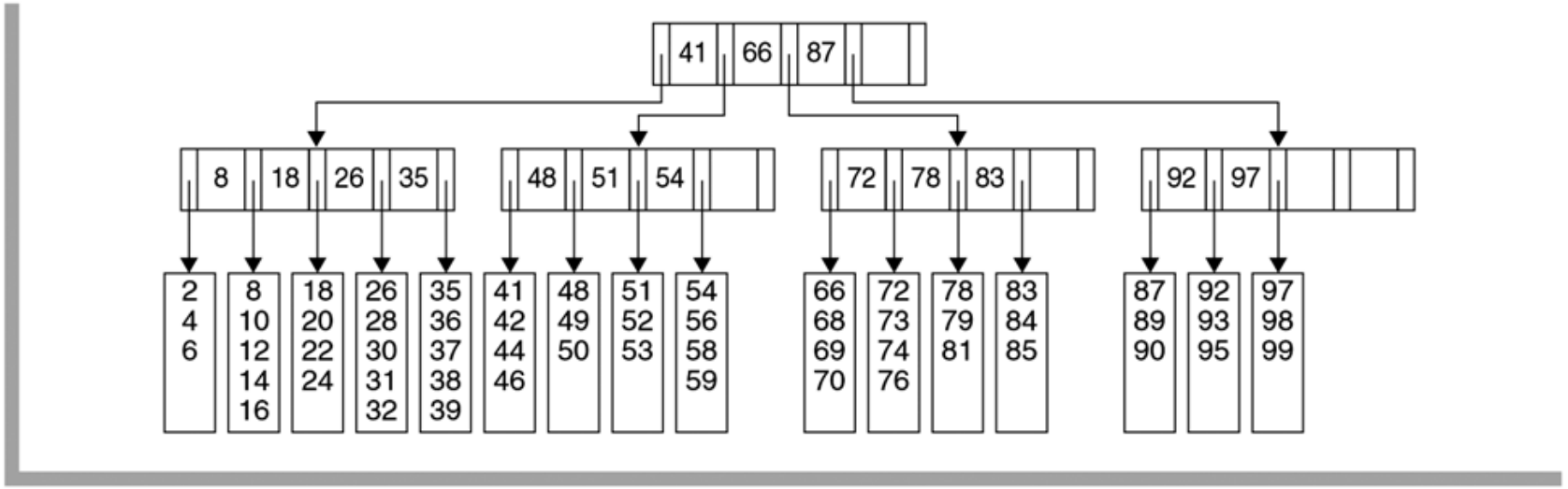

figure 19.84

A B-tree of order 5

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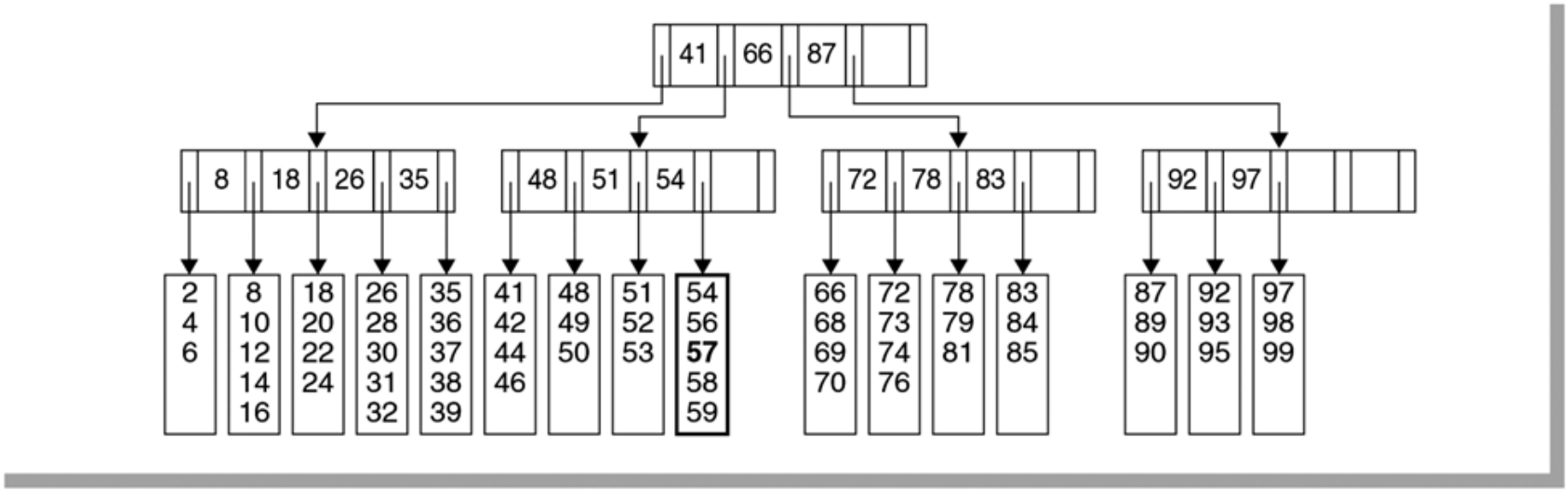

figure 19.85

The B-tree after insertion of 57 in the tree shown in Figure 19.84.

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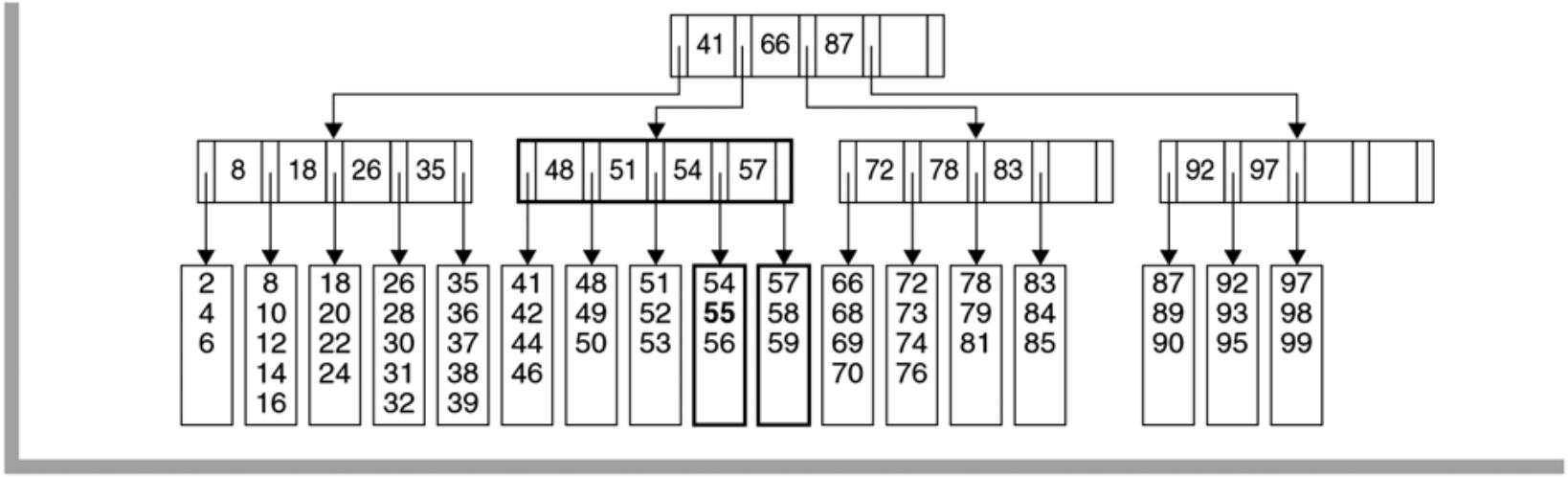

figure 19.86

Insertion of 55 in the B-tree shown in Figure 19.85 causes a split into two leaves.

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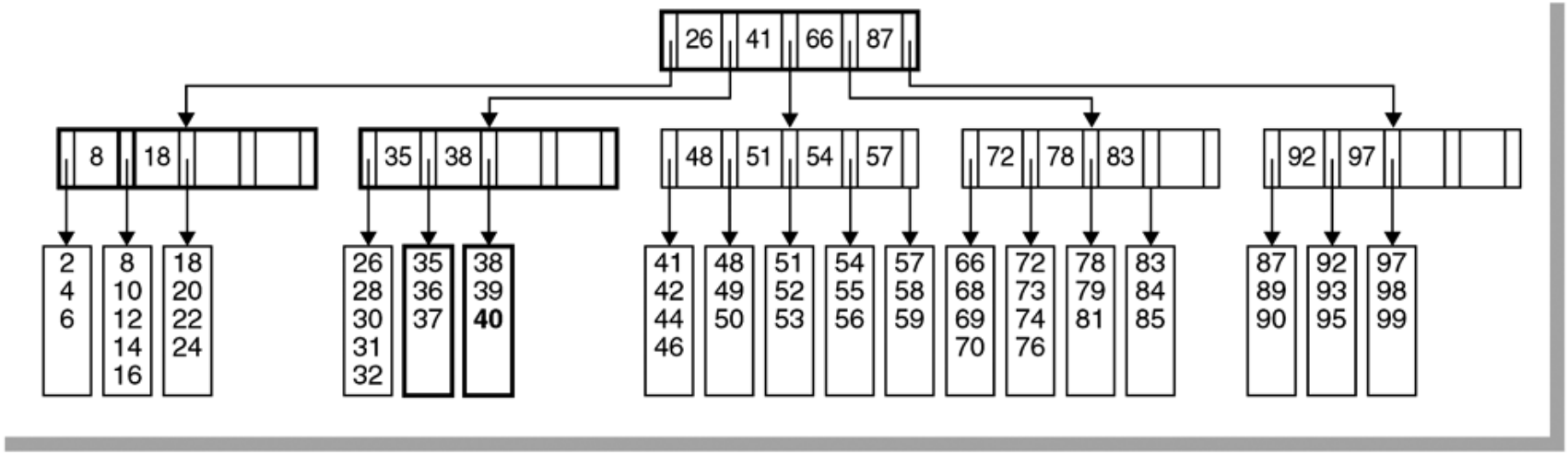

figure 19.87

Insertion of 40 in the B-tree shown in Figure 19.86 causes a split into two leaves and then a split of the parent node.

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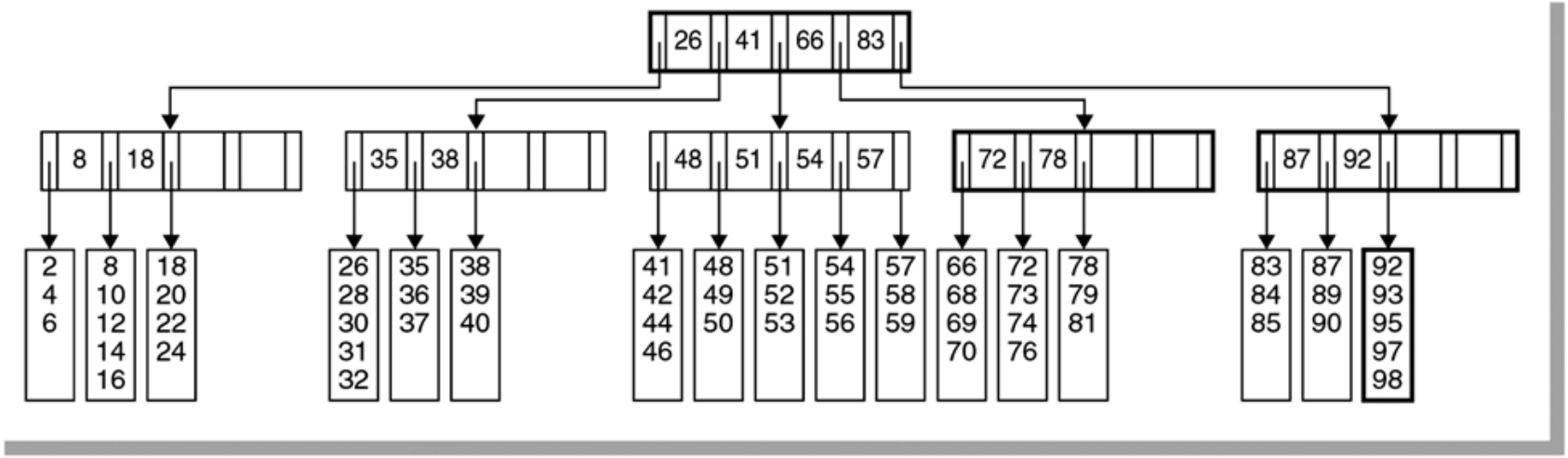

figure 19.88

The B-tree after deletion of 99 from the tree shown in Figure 19.87.

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