AVL INSERT RULES

1. Let the node to be inserted travel down the appropriate branch, keeping track along the way of the deepest-level node on that branch which has a balance factor of +1 or −1. (This particular node is called the **pivot node** for reasons which will soon be apparent.) Insert the node at the appropriate point.
2. Inclusive of and below the pivot node, re-compute all balance factors along the insertion path traced in (1). It will be shown that no nodes other than these can possibly change their balance factors using the AVL method.
3. Determine whether the absolute value of the pivot node's balance factor switched from 1 to 2.
4. If there was such a switch as indicated in (3), perform a manipulation of tree pointers centered at the pivot node to bring the tree back into height balance. Since the visual effect of this pointer manipulation will be to "rotate" the subtree whose root is the pivot node, the operation is frequently referred to as an **AVL-rotation.**

TABLE 3.3

Comparisons used in a search	Completely balanced tree of n nodes	AVL tree of n nodes
Worst possible number	$\lg (n+1)$	$1.44 \lg (n+2)$
Average number	$\lg (n+1) - 2$	$\lg n + 0.25$†

† Based on empirical studies.

...en insertion of a new node thus causes an AVL tree to ... the $HB[1]$ property at one or more nodes, the $HB[1]$ property can be restored by applying exactly one of the four *rotations* in Fig. 3.59.

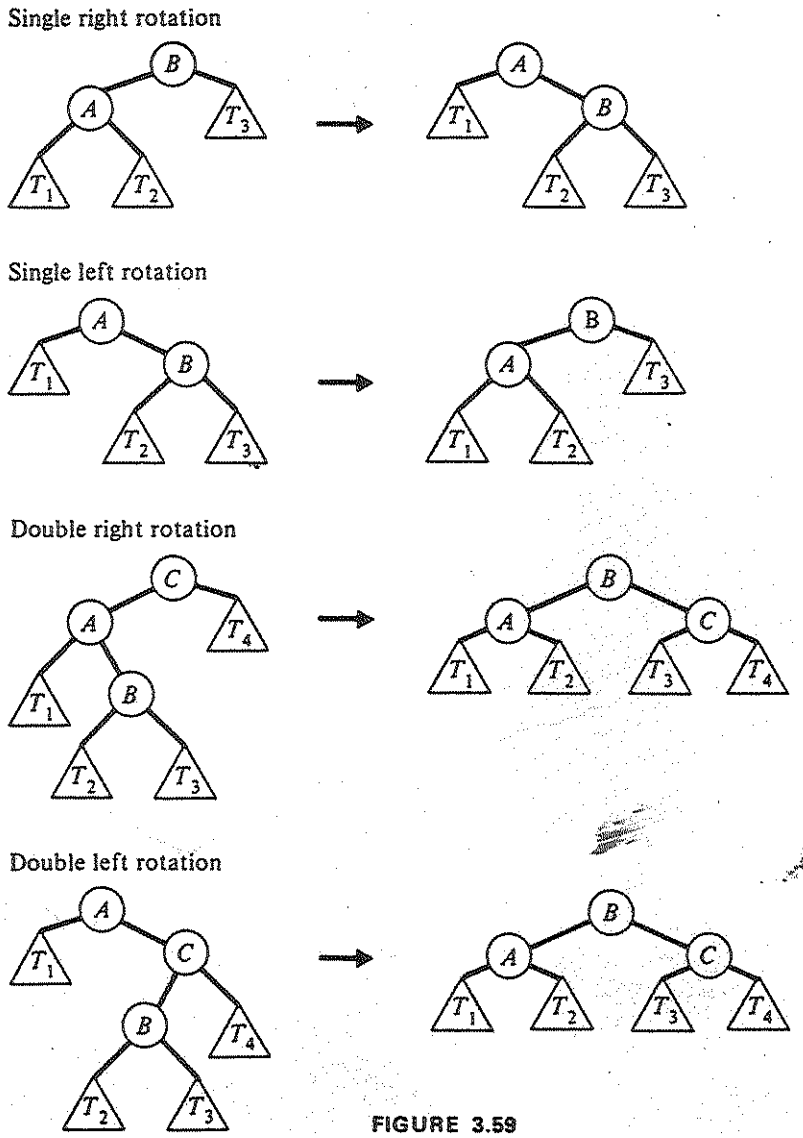

FIGURE 3.59