PSG COLLEGE OF TECHNOLOGY

DEPARTMENT OF COMPUTER APPLICATIONS

23MX22- DESIGN AND ANALYSIS OF ALGORITHMS

WORKSHEET -1

Solve the following problems:

1. Build an AVL tree with the following values: {15, 20, 24, 10, 13, 7, 30, 36, 25} Show the tree after deleting the values {20, 24} from the AVL tree that is constructed. Assume that the deletions are done sequentially.
2. Insert the following values into an AVL tree: 50, 53, 58, 40, 34, 30, 38, 26, 25 and 48. From the resultant tree, delete the following nodes in the given order: 53, 50, 26 and 30.
3. Insert the following keys into an initially empty AVL tree
   30, 20, 10, 40, 50, 60, 25. Show the tree after deleting 20, 10, and 30.Describe the action performed
4. Create B-tree of order 3, 4, 5 with the following keys:
   25, 45, 62, 30, 50, 75, 15, 80, 54, 85, 90, 100, 95,70, 20, 92, 97, 40, 150. Show the tree after deleting**:** 70, 90, 95, 30
   Indicate the action performed at each step
5. Create a B Tree of order 5 and 6 by inserting the following elements in the given order: 78, 21, 14, 11, 97, 85, 74, 63, 45, 42, 57, 20, 16, 19, 52, 30 and 22. Delete 21, 30, 42 and show the resultant tree. Show the intermediate trees when the structure of the tree changes.
6. Insert the elements 29, 30, 34, 5, 17,55, 23, 59, 37, 39, 9, 3, 14, 7, 38, 44 in a B+ tree in the order of 3 and tree of order 4. Show the tree after deleting 55, 34 and 38
7. Create B+ trees of order 4 and order 5 by inserting the following numbers one by one in the given order: 43, 76, 120, 38, 88, 1, 3, 5, 6 , 26, 65, 87, 34, 77, 122, 23, 33 and 138. Indicate the reason for change in the structure of the tree (whenever there is addition or deletion of node). Show the tree after deleting 88 and 33.
8. Create a trie with the following elements: file, fill, car, cat, rose, star, stare. Illustrate the following operations on the trie: search ros, delete star and fill.
9. Construct a Trie with the following octal numbers 10, 427, 437, 7, 12, 55, 125. How many searches are required in locating 7, 10 and 140.
10. Construct a trie for the binary keys 011,111,101,001,110,100,010. Show how the element 111 is retrieved.