Lab Sheet 11

Do the following problems on your notebooks.

1. Insert the following elements on an AVL tree in the order shown: 40, 30, 65, 34, 20, 12. Whenever the tree gets unbalanced, indicate if it is LL or RR type of imbalance. Carry out the necessary rotation. Put 34 in appropriate place so that the overall tree is still a BST and redraw the balanced AVL tree.

2. Insert the following elements on an AVL tree in the order shown: 52, 65, 20, 80, 72, 93. Whenever the tree gets unbalanced, carry out necessary rotations.

3. Insert the following elements on an AVL tree in the order shown: 52, 68, 30, 86, 61, 55. Whenever the tree gets unbalanced, carry out necessary rotations. Redraw the balanced AVL tree.

4. Insert the following elements on an AVL tree in the order shown: 48, 68, 30, 86, 61, 66. Whenever the tree gets unbalanced, carry out necessary rotations. Indicate if it is LL, RR, LR or RL type of imbalance. Redraw the balanced AVL tree.

5. Insert the following elements on an AVL tree in the order shown: 62, 40, 95, 50, 22, 55. Whenever the tree gets unbalanced, carry out necessary rotations. Indicate if it is LL, RR, LR or RL type of imbalance. Take special care to relocate 55. Redraw the balanced AVL tree

6. Consider the following tree. Check if it can be called a minheap Tree.

0	1	2	3	4	5	6	7	8	9	10	11	12	13
	15	41	35	82	75	40	30	95	102	78	85		

7. Consider following minHeap tree. Insert 46 on this tree.

0	1	2	3	4	5	6	7	8	9	10	11	12	13
	15	41	35	82	75	40	62	95	102	78			

8. Insert 12 on this heap tree.

0	1	2	3	4	5	6	7	8	9	10	11	12	13
	15	41	35	82	75	40	62	95	102	78			

9. Consider following maxHeap tree. Insert 46 on this tree.

0	1	2	3	4	5	6	7	8	9	10	11	12	13
	105	62	96	26	50	42	85	13	20	35	48		

10. Consider following Heap tree. Carry out Delete operation on it.

0	1	2	3	4	5	6	7	8	9	10	11	12	13
	105	62	96	26	50	42	85	13	20	35	48		

11. Put this elements on a complete tree and then heapify it to convert it to a minheap [45 23 93 65 12 80 77 55]

12. Put these elements on an empty minheap tree in the order shown and then heapify the tree.

[45 23 93 65 12 80 77 55 42 32 15 60 8]

13. Sort the following on your notebooks using Heapsort:

[66 23 34 12 89 107 32 82 77 4 55]

14. Consider a maxheap with elements as [80 60 40 45 52 35 20]. Implement insertion program taking help from the code given in https://www.geeksforgeeks.org/insertion-and-deletion-in-heaps/ and insert 72 on this tree.