PL205 Data and File Structures Lab

Prerequisites: PL105

List of Sample Lab Assignments :

ADT Specifications and Implementation of following basic data structures -

1. String Data Type
2. Sparse matrix
3. Polynomial
4. Singly Linked Linear Lists
5. Singly Linked Circular Lists
6. Doubly Linked Linear Lists
7. Doubly Linked Circular Lists
8. Linked Lists with Header Nodes
9. Generic Linked Lists
10. Stacks
11. Queues

ADT Specifications and Implementation of following non-linear data structures

12. Graphs
13. Binary Trees
14. Binary Search Trees
15. AVL Trees
16. Threaded Binary Trees
17. B-Trees and its variants
18. Tries

Applications of Stacks and Queues

19. Convert infix expression into postfix expression.
20. Evaluate postfix expression
21. Traversing a binary tree – inorder, preorder, postorder

22. Write a program to implement a circular buffer of size N using the concept of queue. The characters should be added to the end of queue. After the buffer gets full the characters must be removed from the beginning of the queue to make space for new character as they are entered. Print the characters to console as they are removed.

Applications of Binary Trees

23. Write a program to implement Huffman encoding using Binary tree.
24. Write a program to create a binary tree for the given infix expression.
25. Write a program that creates a binary tree given a set of numbers and checks if it is complete.
26. Write a program to implement a Heap and Heap Sort
27. Write a program to implement Priority Queues using Heap

Applications of AVL Trees

28. Write a program that reads a list of names and telephone number from a text file and inserts them into an AVL tree. Write function to allow the user to search the tree for any name and print the telephone number for that name if it exists in the tree.

Applications of Graphs

29. Write a program to implement minimum spanning tree algorithm.
30. Write a program to find the shortest path between any two vertices.

File Handling

31. Write a program that given two text file containing English words, would sort and merge them into a third file.
32. Write a program to build B-tree/B+ tree for a given text file containing student records. Student roll number may be used as key.

A Mini Project

To implement and demonstrate the use of any advanced data structure (need not be from the syllabus)