PUNE INSTITUTE OF COMPUTER TECHNOLOGY
DHANKAWADI, PUNE – 43.

LIST OF LAB EXPERIMENTS
ACADEMIC YEAR: 2021-2022

DEPARTMENT: COMPUTER ENGINEERING　　　　**Date: 03/01/2022**

CLASS: S.E.　　　　　　　　　　　　　　　　　**SEMESTER: II**

SUBJECT: 210256- Data Structures and Algorithms Laboratory

Assignment No.	PROBLEM STATEMENT
	Group A
1	Beginning with an empty binary tree, construct binary tree by inserting the values in the order given. After constructing a binary tree perform following operations on it- • Perform inorder, preorder and post order traversal (Implement both recursive and non-recursive methods) • Change a tree so that the roles of the left and right pointers are swapped at every node • Find the height of tree • Copy this tree to another [operator=] • Count number of leaves, number of internal nodes. • Erase all nodes in a binary tree.
2	A Dictionary stores keywords and its meanings. Provide facility for adding new keywords, deleting keywords, updating values of any entry. Provide facility to display whole data sorted in ascending/ Descending order. Also find how many maximum comparisons may require for finding any keyword. Use Binary Search Tree for implementation.
3	Create an inordered threaded binary tree and perform inorder and preorder traversals. Analyze time and space complexity of the algorithm.
	Group B
4	Consider telephone book database of N clients. Make use of a hash table implementation to quickly look up client's telephone number. Make use of two collision handling techniques and compare them using number of comparisons required to find a set of telephone numbers (use linear probing with replacement and without replacement)
5	Implement all the functions of a dictionary (ADT) using hashing and handle collisions using separate chaining using linked list. Data: Set of (key, value) pairs, Keys are mapped to values, Keys must be comparable, Keys must be unique. Standard Operations: Insert (key, value),

	Find(key), Delete(key)
	Group C
6	Represent a given graph using adjacency list to perform DFS and BFS. Use the map of the area around the college as the graph. Identify the prominent landmarks as nodes and perform DFS and BFS on that.
7	You have a business with several offices; you want to lease phone lines to connect them up with each other; and the phone company charges different amounts of money to connect different pairs of cities. You want a set of lines that connects all your offices with a minimum total cost. Solve the problem by suggesting appropriate data structures.
	Group D
8	Given sequence k = k1 <k2 < … <kn of n sorted keys, with a search probability pi for each key ki . Build the Binary search tree that has the least search cost given the access probability for each key.
9	A Dictionary stores keywords and its meanings. Provide facility for adding new keywords, deleting keywords, updating values of any entry. Provide facility to display whole data sorted in ascending/ Descending order. Also find how many maximum comparisons may require for finding any keyword. Use Height balance tree and find the complexity for finding a keyword.
	Group E
10	Implement the Heap sort algorithm implemented in Java demonstrating heap data structure with modularity of programming language
	Group F
11	Department maintains a student information. The file contains roll number, name, division and address. Allow user to add, delete information of student. Display information of particular employee. If record of student does not exist an appropriate message is displayed. If it is, then the system displays the student details. Use sequential file to main the data.
12	Implementation of a direct access file -Insertion and deletion of a record from a direct access file

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