21-805-0206: Lab 4 - Data Structures Lab

Assignment 4

Instructions:
1. All programs have to be submitted as .cpp files that can be compiled and executed without error. The input & output shall be included in the same file as comments
2. A separate pdf file named as "**rollno_firstName**" shall be submitted for questions that require an explanation (marked with *). This should be **hand written.**
3. Compress all the above as a single .zip file and upload in the moodle page before **25/08/23**

Part 5: Stack, Queue

1. Implement a stack using array with the following operations : PUSH, POP, ISEMPTY, SIZE()
2. Implement a stack using Linked List with the following operations : PUSH, POP, ISEMPTY, SIZE()
3. Implement a queue using array with the following operations : ENQUEUE, DEQUEUE, ISEMPTY, SIZE()
4. Implement a circular queue using array with the following operations : ENQUEUE, DEQUEUE, ISEMPTY, SIZE()

Part 6: Binary Tree and Hashing

1. Create a Binary Search Tree which supports the following operations:
   - insert(tree, element) – adds the node specified by element (which contains the data) into the BST specified by tree.
   - search(tree, key) – searches for the data specified by key in the BST specified by tree.
   - delete(tree, element) – removes the node specified by element from the BST specified by
   - tree.
   - inorder(tree) – To do a recursive inorder traversal of the BST.
   - preorder(tree) – To do a recursive preorder traversal of the BST.
   - postorder(tree) – To do a recursive postorder traversal of the BST.

   Write a menu driven program to demonstrate these operations.

2. Implement a hash table with linear probing using array with the following operations : INSERT(key), DELETE(key), SEARCH(key).
3. Implement a hash table with quadratic probing using array with the following operations :INSERT(key), DELETE(key), SEARCH(key).
4. Implement a hash table with double hashing using array with the following operations : INSERT(key), DELETE(key), SEARCH(key).
5. Implement a hash table using Linked List with separate chaining with the following operations : INSERT(key), DELETE(key), SEARCH(key).