Lab Assignment 5: CS2233

20th September, 2024

Kindly adhere to the following instructions.

- Please write a C/C++ program corresponding to each problem. Your code should be well commented and variable names should be appropriately chosen. Also, prepare a `readme` text file where you can mention instructions to run the program/how to take input, etc.

- Create a folder and put all the code files and `readme` text file in it, give a name to the folder as "yourName_yourRollNo", zip the folder and submit it to the Google Classroom portal.

- Your code will also be checked against plagiarism (both from web and peer).

- Any form of plagiarism (web/chatGPT/with peers) will be severely penalised and will result in an F grade.

Question:

Construct an AVL tree over the following keys (assuming you read the numbers from left to right).

$9, 8, 5, 4, 99, 78, 31, 34, 89, 90, 21, 23, 45, 77, 88, 112, 32.$

The AVL tree should be constructed by calling the `insert (root, key)` listed below.

Each node of the tree should use the following `struct` data type:

```
struct node
{
int data;
int height; /* stores the height of subtree rooted current node */
struct node *left;
struct node *right;
struct node *parent;
};
```

Note: The use of parent pointers and heights in the above `struct` definition is optional.

You can assume that you have stored the pointer to the `root` node. Please, write the functions for:

1. `delete (root, key)` – this function takes the pointer to the `root` node, and the key as input, and deletes the corresponding node. Please run your functions for deleting nodes $88, 9, 71, 67$. Your code should output an error message if the `key` is absent in the AVL tree. Print `inorder` and `preorder` traversal of the respective trees upon each deletion.