Lab Assignment 5: CS2233

17th September, 2025

Question:

Construct a binary search tree over the following keys (assuming you read the numbers from left to right).

$12, 31, 34, 56, 78, 89, 91, 32, 56, 81, 100, 2, 55, 21, 99, 121, 67$.

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

```
struct node
{
int data;
struct node *left;
struct node *right;
};
```

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

1. `search (root, key)` – this function takes the pointer to the `root` node, and `key` as input, and returns the pointer to the node where `key` is present. If `key` is not present in BST, then the code should output an error message. Please run your function for searching nodes $32, 56, 90$.

2. `insert (root, key)` – this function takes the pointer to the `root` node, and key as input, and inserts the node at the appropriate position. Please run your function for inserting nodes $32, 56, 21, 90$.

3. `successor (root, key)` – this function takes the pointer to the `root` node and key as input and returns the pointer to the successor node. If `key` is not present in BST, then the code should output an error message. Please run your function to find the successor of key $32, 56, 21, 90$. Recall that the successor of a node in BST is the smallest node that is bigger than the given node.

4. `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 $332, 51, 71, 67$. Your code should output an error message if the `key` is not present in the BST.

5. In points 2, and 4, the output should be the tree obtained after node insertion/deletion. Please output the tree by printing the nodes level-by-level.