LAB - (8) : - Binary Search Tree

15/1/24

```
#include <stdio.h>
#include <stdlib.h>

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

struct node *newNode(int data)
{
    struct node *node = (struct node*) malloc
                        (sizeof(struct node));

    node->data = data;
    node->left = node->right = NULL;
    return node;
}
```

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```
struct node *insert(struct node *root, int data)
{
    if (root == NULL)
        return newNode(data);
    if (data <= root->data)
        root->left = insert(root->left, data);
    else
        root->right = insert(root->right, data);
    return root;
}
```

```
void inorder (struct node *temp)
{
    if (temp == NULL)
        return;
    inorder (temp -> left);
    printf ("%d", temp -> data);
    inorder (temp -> right);
}

void preorder (struct node * temp)
{
    if (temp == NULL)
        return;
    printf ("%d", temp -> data);
    preorder (temp -> left);
    preorder (temp -> right);
}

void postorder (struct node * temp)
{
    if (temp == NULL)
        return;
    postorder (temp -> left);
    postorder (temp -> right);
    printf ("%d", temp -> data);
}
```

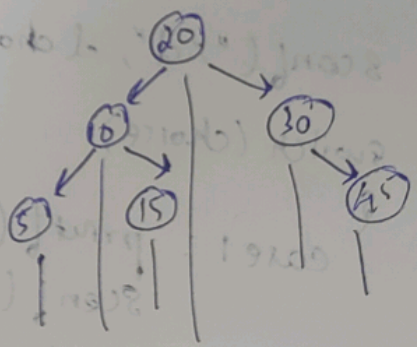
int main()
{

```
int main ()
{
struct node * root = NULL;
int data, choice;

do
{
printf ("Enter your choice: \n 1. Insert \n 2. Print
Inorder \n 3. Print Preorder \n 4. Print Postorder \n
5. Exit \n");
scanf ("%d", &choice);
switch (choice)
{
case 1: printf ("Enter value to be inserted: ");
        scanf ("%d", &data);
        root = insert (root, data);
        break;
case 2: printf ("Inorder traversal of binary tree
                 is \n");
        inorder (root);
        printf ("\n");
        break;
```

```
case 3: printf("Preorder traversal of binary tree is \n");
        preorder(root);
        printf("\n");
        break;
case 4: printf("Postorder traversal of binary tree is\n");
        postorder(root);
        printf("\n");
        break;

case 5  : printf("Exiting...");
        break;

default: printf("Invalid choice");
}

} while(choice!=5);
return 0;
}
```

Output:

```
Enter your choice:
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit
1
Enter value to be inserted : 20
Enter your choice:
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit
```




```
1
Enter value
Enter your
1. Insert
2. Print In
3. Print Pr
4. Print Po
5. Exit
1
Enter value
Enter you
1. Insert
2. Print I
3. Print P
4. Print P
5. Exit
1
Enter valu
Enter yo
1. Inser
2. Print
3. Print
4. Print
5. Exi
1
Enter v
Enter
1. Inse
2. Prin
3. Pri
4. Prin
5. Ex
1
Enter
```

binary tree is in :)

binary tree is in :)

1
Enter value to be inserted : 10
Enter your choice :
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

1
Enter value to be inserted : 30
Enter your choice :
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

1
Enter value to be inserted : 5
Enter your choice :
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

1
Enter value to be inserted : 15
Enter your choice :
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

1
Enter value to be inserted : 45

Enter your choice:
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

2

Inorder traversal of binary tree is:
5 10 15 20 30 45

Enter your choice:
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

3

Preorder traversal of binary tree is:
20 10 5 15 30 45

Enter your choice:
1. Insert
2. Print Inorder
3. Print Preorder
4. Print Postorder
5. Exit

4

Postorder traversal of binary tree is:
5 15 10 45 30 20

Leetcode → Re

struct ListNod
{
if(head ==
ret
int len =
struct L
while (t
{
tai
len
}
k = k
if(k =
struct
for (
{
}
fa
he
p
9
}