Data Structure Lab

Assignment No-10

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1. Implementation of Binary Search Tree and its Application.

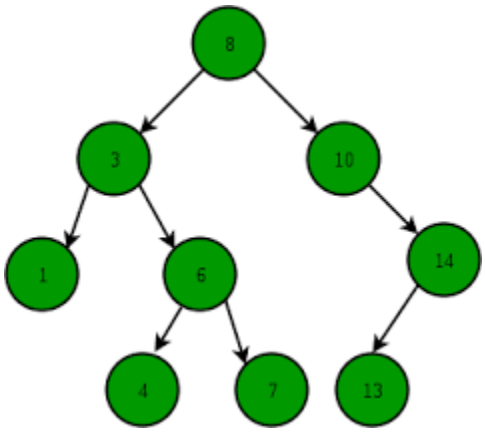
Code:

```
# include <bits/stdc++.h>
using namespace std;

class Tree
{ //Tree initiation
    public:
    Tree *right,*Left;
    int data;
    int height;
};

// Searching in an binary search tree.
bool BSTsearch(class Tree *root,int d){
    while(root!=NULL)
    if(root->data==d){
        return true;
    }
    else if(d<root->data){
        root=root->Left;
    }
    else {
        root=root->right;
    }
    return false;
}
```

```
// TO insert the data in a BST
class Tree* insert(int d,class Tree *root){
    Tree *pointer,*p,*t=root;

    if(root==NULL){
        p=new Tree;
        p->data=d;
        p->right=p->Left=NULL;
        root=p;
        return root;
    }

    while(t!=NULL){
        pointer=t;
        if(d==t->data){
            return root;
        }
        else if(d<t->data){
            t=t->Left;
        }
        else {
            t=t->right;
        }
    }

p=new Tree;
p->data=d;
p->Left = p->right = NULL;
        if(d<pointer->data){
            pointer->Left=p;
        }
        else{
            pointer->right=p;
        }
    return root;
}

// Inorder traversal it gives the elements in an sorted order
void inorder(Tree *root){
```

```
    if(root==NULL)return ;
    inorder(root->Left);
    cout<<root->data<<" ";
    inorder(root->right);
}

// main FUnction
int main(){
    Tree *ans=NULL;
    // creation of an BST
    ans=insert(8,ans);
    ans=insert(3,ans);
    ans=insert(1,ans);
    ans=insert(10,ans);
    ans=insert(14,ans);
    ans=insert(20,ans);
    ans=insert(6,ans);
    ans=insert(7,ans);
    ans=insert(4,ans);
    // searching in an BST
    BSTsearch(ans,52)?cout<<"Present \n":cout<<"Not Present\n";
    // For inorder traversal
    inorder(ans);
    return 0;
}
```

INPUT:



OUTPUT:


OUTPUT
DEBUG CONSOLE
TERMINAL
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
PS C:\Users\sai\Desktop\Competative P> cd "c:\Users\sai\Desktop\Competative
; if ($?) { .\BST }
Element is Not Present
The inorder traersal of the binary search tree is as follows
1 3 4 6 7 8 10 13 14
PS C:\Users\sai\Desktop\Competative P>