**DS Lab Program**

**Program 10:**

**Design, Develop and Implement a menu driven Program in C for the following operations on Binary Search Tree (BST) of Integers**

1. **Create a BST of N Integers: 6, 9, 5, 2, 8, 15, 24, 14, 7, 8, 5, 2**
2. **Traverse the BST in Inorder, Preorder and Post Order**
3. **Search the BST for a given element (KEY) and report the appropriate message**
4. **Delete an element(ELEM) from BST**
5. **Exit**

#include<stdio.h>

typedef struct node

{

int info;

struct node \*llink;

struct node \*rlink;

}NODE;

NODE \*root=NULL;

void inorder(NODE \*ptr)

{

if(ptr)

{

inorder(ptr->llink);

printf("%d ",ptr->info);

inorder(ptr->rlink);

}

}

void preorder(NODE \*ptr)

{

if(ptr)

{

printf("%d ",ptr->info);

preorder(ptr->llink);

preorder(ptr->rlink);

}

}

void postorder(NODE \*ptr)

{

if(ptr)

{

postorder(ptr->llink);

postorder(ptr->rlink);

printf("%d ",ptr->info);

}

}

void create()

{

NODE \*nn,\*prev,\*temp;

int i,n;

printf("enter the value of n\n");

scanf("%d",&n);

for(i=1;i<=n;i++)

{

nn=(NODE\*)malloc(sizeof(NODE));

printf("enter the info\n");

scanf("%d",&nn->info);

nn->llink=NULL;

nn->rlink=NULL;

if(root==NULL)

root=nn;

else

{

temp=root;

while(temp!=NULL)

{

prev=temp;

if(nn->info>temp->info)

temp=temp->rlink;

else

temp=temp->llink;

}

if(nn->info<prev->info)

prev->llink=nn;

else

prev->rlink=nn;

}

}

}

NODE \* search(NODE \*temp,int key)

{

if(temp==NULL) return NULL;

else if(key<temp->info)

return search(temp->llink,key);

else if(key>temp->info)

return search(temp->rlink,key);

else

return temp;

}

void main()

{

int ch,key; NODE \*f;

do

{

printf("\n1:create 2:inorder 3:preorder 4:postorder 5:search\n");

scanf("%d",&ch);

switch(ch)

{

case 1:create();

break;

case 2: inorder(root);

break;

case 3: preorder(root);

break;

case 4: postorder(root);

break;

case 5: printf("enter the key\n");

scanf("%d",&key);

f=search(root,key);

if(f==NULL)

printf("key not found\n");

else

printf("key found \n");

break;

}

}

while(ch<=5);

}