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Roll:53

Subject:DSA

LAB ASSIGNMENT NO. 06

```
#include<iostream>
#include<stdlib.h>
//#define MAX 10
using namespace std;
struct node
{
int lbit;
node *left;
int data;
node *right;
int rbit;
};
class tree
{
public :
 node *root;
 node *head;
 void get_create();
 void get_insert(node *,node *);
 void inorder(node *);
 void preorder(node *);
};
void tree::get_create()
{
 node *temp;
 char ch;
 head=new node;
```

```
 head->data=999;
 head->right=head;
 head->lbit=1;
 head->rbit=0;
 root=NULL;
do
{
temp=new node;
cout<<"\n\tEnter the value of node :";
cin>>temp->data;
temp->left=NULL;
temp->right=NULL;
temp->rbit=0;
temp->lbit=0;
if(root==NULL)
{
root=temp; //Mark temp node as root as initially tree is empty
head->left=root;//dummy node
root->right=head; //check if 1st node
root->left=head;
root->rbit=0;
root->lbit=0;
}
else //If root is already created
{
get_insert(root,temp);
}
cout<<"\n\tDo you want Continue ? (Press Y/N)";
cin>>ch;
}
while(ch=='Y'||ch=='y');
}
```

```
void tree::get_insert(node *root,node *temp)
{
 char op;
 if(temp->data<=root->data)
 {
if(root->lbit==0)
{
temp->left=root->left; //root left is pointing to head so now temp left will point to head
temp->right=root; // temp right to root
root->left=temp; // root left to temp
root->lbit=1;
}
else
get_insert(root->left,temp); //for next insertions root left i.e. temp will become root
 }
 else // (temp->data>root->data)
 {
 if(root->rbit==0)
 {
temp->right=root->right;
temp->left=root;
root->right=temp;
root->rbit=1;
 }
else
get_insert(root->right,temp);
 }
} void tree::inorder(node *head)
{
if(root==NULL)
return;
node *t=head->left; //start traversing from root ,take temp pointer t
```

```
do
{
while(t->lbit!=0)
{
t=t->left;
}
cout<<" "<<t->data;
while(t->rbit==0)
{
t=t->right; //follow the thread back now check whether it is pointing to head
if(t==head) // check if right points to head stop
{
return;
}
cout<<" "<<t->data;
}
t=t->right;
}while(t!=head);
}
//-----------------------------------------------------------------------------------------
void tree::preorder(node *head)
{
if(root==NULL)
return;
node *t=head->left;
do
{
while(t->lbit!=0)
{
cout<<" "<<t->data;
t=t->left;
}
```

```
cout<<" "<<t->data;
while(t->rbit==0)
{
t=t->right;
if(t==head)
return;
}
t=t->right;
}while(t!=head);
}
int main()
{
int op;
tree t;
// clrscr();
cout<<"\n\t\t----------THREADED BINARY TREE OPERATIONS----------";
cout<<"\n\n\tCreation of Binary Tree\n ";
t.get_create();
do
{
cout<<"\n\n\t1>Inorder Traversing.\n\t2>Preorder Traversing.\n\t3>Creating Tree Again.\n\t4>Exit.";
cout<<"\n\tEnter your choice:";
cin>>op;
switch(op)
{
case 1:
cout<<"\n\t Inordered traversal :";
t.inorder(t.head);
break;
 case 2:
cout<<"\n\t Preordered traversal :";
t.preorder(t.head);
```

```
break;
case 3:
cout<<"\n\tCreation of Binary Tree\n ";
t.get_create();
break;
case 4:
exit(0);
break;
}
}while(op!=4);
}
```

Output

```
----------THREADED BINARY TREE OPERATIONS----------

        Creation of Binary Tree

        Enter the value of node :5

        Do you want Continue ? (Press Y/N)y

        Enter the value of node :9

        Do you want Continue ? (Press Y/N)y

        Enter the value of node :4

        Do you want Continue ? (Press Y/N)y

        Enter the value of node :6
```

Do you want Continue ? (Press Y/N)y

Enter the value of node :12

Do you want Continue ? (Press Y/N)y

Enter the value of node :7

Do you want Continue ? (Press Y/N)n

1>Inorder Traversing.
2>Preorder Traversing.
3>Creating Tree Again.
4>Exit.
Enter your choice:1

Inordered traversal : 4 5 6 7 9 12

1>Inorder Traversing.
2>Preorder Traversing.
3>Creating Tree Again.
4>Exit.
Enter your choice:2

Preordered traversal : 5 4 9 6 7 12

1>Inorder Traversing.
2>Preorder Traversing.
3>Creating Tree Again.
4>Exit.
Enter your choice:3

Creation of Binary Tree

Enter the value of node :8

Do you want Continue ? (Press Y/N)t y

Enter the value of node :6

Do you want Continue ? (Press Y/N)y

Enter the value of node :15

Do you want Continue ? (Press Y/N)y

Enter the value of node :13

Do you want Continue ? (Press Y/N)n

1>Inorder Traversing.
2>Preorder Traversing.
3>Creating Tree Again.
4>Exit.
Enter your choice:1

Inordered traversal : 6 8 13 15

1>Inorder Traversing.
2>Preorder Traversing.
3>Creating Tree Again.
4>Exit.

Enter your choice:2

Preordered traversal : 8 6 15 13

1>Inorder Traversing.

2>Preorder Traversing.

3>Creating Tree Again.

4>Exit.

Enter your choice:4