

## main.c

```
1 #include<stdio.h>
2 #include<stdlib.h>
3 #include<string.h>
4 struct node
5 {
6     int info;
7     struct node*llink;
8     struct node*rlink;
9 };
10 typedef struct node*NODE;
11 NODE getnode()
12 {
13     NODE x;
14     x=(NODE)malloc(sizeof(struct node));
15     if(x==NULL)
16     {
17         printf("Memory not available!");
18         exit(0);
19     }
20     return x;
21 }
22 void freenode(NODE x)
23 {
24     free(x);
25 }
26 NODE insert(int item,NODE root)
27 {
28     NODE temp,cur,pnext;
29     char direction[10];
```



# main.c

```
-- 33     temp->llink=NULL;
34     temp->rlink=NULL;
35     if(root==NULL)
36     | return temp;
37     printf("Give direction to insert.. \n");
38     scanf("%s",direction);
39     prev=NULL;
40     cur=root;
41     for(i=0;i<strlen(direction)&&cur!=NULL;i++)
42     {
43     prev=cur;
44     if(direction[i]=='l')
45     cur=cur->llink;
46     else
47     cur=cur->rlink;
48     }
49     if(cur!=NULL||i!=strlen(direction))
50     {
51     printf("Insertion not possible\n");
52     freenode(temp);
53     return(root);
54     }
55     if(cur==NULL)
56     {
57     if(direction[i-1]=='l')
58     prev->llink=temp;
59     else
60     prev->rlink=temp;
61     }
```



## main.c

```
68     printf("the item is %d\n",root->info);
69     preorder(root->llink);
70     preorder(root->rlink);
71 }
72 }
73 void inorder(NODE root)
74 {
75     if(root!=NULL)
76     {
77         inorder(root->llink);
78         printf("The item is %d\n",root->info);
79         inorder(root->rlink);
80     }
81 }
82 void postorder(NODE root)
83 {
84     if (root!=NULL)
85     {
86         postorder(root->llink);
87         postorder(root->rlink);
88         printf("The item is %d\n",root->info);
89     }
90 }
91 void display(NODE root,int i)
92 {
93     int j;
94     if(root!=NULL)
95     {
96         display(root->rlink,i+1);
```



## main.c

```
104 int main()
105 {
106     NODE root=NULL;
107     int choice,i,item;
108
109     for(;;)
110     {
111         printf
112             ("1.Insert\n2.Preorder\n3.Inorder\n4.Postorder\n5.Display\n");
113         printf("Enter the choice:\n");
114         scanf("%d",&choice);
115         switch(choice)
116         {
117             case 1: printf("Enter the item:\n");
118             scanf("%d",&item);
119             root=insert(item,root);
120             break;
121             case 2: if(root==NULL)
122             {
123                 printf("Tree is empty!");
124             }
125             else
126             {
127                 printf("Given tree is..");
128                 display(root,1);
129                 printf("The preorder traversal is:\n");
130                 preorder(root);
131             }
132         }
133     }
134 }
```

## main.c

```
132 case 3:if(root==NULL)
133     {
134         printf("Tree is empty");
135     }
136     else
137     {
138         printf("Given tree is..");
139         display(root,1);
140         printf("The inorder traversal is \n");
141         inorder(root);
142     }
143     break;
144 case 4:if (root==NULL)
145     {
146         printf("Tree is empty");
147     }
148     else
149     {
150         printf("Given tree is..");
151         display(root,1);
152         printf("The postorder traversal is \n");
153         postorder(root);
154     }
155     break;
156 case 5:display(root,1);
157     break;
158 default:printf("Invalid choice entered.\n");
159         exit(0);
160 }
```



```
4     |     printf("NULL),  
4     |     }  
5     |     break;  
6 case 5:display(root,1);  
7     |     | break;  
8 default:printf("Invalid choice entered.\n");  
9     |     | exit(0);  
10    }  
11 }  
12 return 0;  
13 }
```

Console

Shell

```
* clang-7 -pthread -lm -o main main.c
* ./main
1.Insert
2.Preorder
3.Inorder
4.Postorder
5.Display
Enter the choice:
1
Enter the item:
23
1.Insert
2.Preorder
3.Inorder
4.Postorder
5.Display
Enter the choice:
1
Enter the item:
34
Give direction to insert..
11
Insertion not possible
1.Insert
2.Preorder
3.Inorder
4.Postorder
5.Display
Enter the choice:
1
Enter the item:
45
Give direction to insert..
```

Give direction to insert..

r

- 1.Insert
- 2.Preorder
- 3.Inorder
- 4.Postorder
- 5.Display

Enter the choice:

1

Enter the item:

78

Give direction to insert..

lr

Insertion not possible

- 1.Insert
- 2.Preorder
- 3.Inorder
- 4.Postorder
- 5.Display

Enter the choice:

1

Enter the item:

43

Give direction to insert..

r1

- 1.Insert
- 2.Preorder
- 3.Inorder
- 4.Postorder
- 5.Display

Enter the choice:

1

Enter the item:

Q

Enter the item:

43

Give direction to insert..

r1

1.Insert

2.Preorder

3.Inorder

4.Postorder

5.Display

Enter the choice:

1

Enter the item:

55

Give direction to insert..

rr

Insertion not possible

1.Insert

2.Preorder

3.Inorder

4.Postorder

5.Display

Enter the choice:

5

43

45

23

1.Insert

2.Preorder

3.Inorder

4.Postorder

5.Display

Enter the choice:

> |