```c
#include<stdio.h>
#include<stdlib.h>
#include<process.h>
struct node
 {
  int info;
  struct node *rlink;
  struct node *llink;
 };
typedef struct node *NODE;
NODE getnode()
{
NODE x;
x=(NODE)malloc(sizeof(struct node));
if(x==NULL)
 {
  printf("mem full\n");
  exit(0);
 }
 return x;
}
void freenode(NODE x)
{
free(x);
}
NODE insert(NODE root,int item)
{
NODE temp,cur,prev;
temp=getnode();
temp->rlink=NULL;
temp->llink=NULL;
```

```
temp->info=item;
if(root==NULL)
 return temp;
prev=NULL;
cur=root;
while(cur!=NULL)
{
prev=cur;
cur=(item<cur->info)?cur->llink:cur->rlink;
}
if(item<prev->info)
 prev->llink=temp;
else
 prev->rlink=temp;
return root;
}
void display(NODE root,int i)
{
int j;
if(root!=NULL)
 {
  display(root->rlink,i+1);
  for(j=0;j<i;j++)
      printf("   ");
   printf("%d\n",root->info);
     display(root->llink,i+1);
 }
}
NODE delete(NODE root,int item)
{
NODE cur,parent,q,suc;
```

```
if(root==NULL)
{
printf("empty\n");
return root;
}
parent=NULL;
cur=root;
while(cur!=NULL&&item!=cur->info)
{
parent=cur;
cur=(item<cur->info)?cur->llink:cur->rlink;
}
if(cur==NULL)
{
 printf("not found\n");
 return root;
}
if(cur->llink==NULL)
 q=cur->rlink;
else if(cur->rlink==NULL)
 q=cur->llink;
else
 {
 suc=cur->rlink;
 while(suc->llink!=NULL)
  suc=suc->llink;
 suc->llink=cur->llink;
 q=cur->rlink;
 }
 if(parent==NULL)
  return q;
```

```
 if(cur==parent->llink)
  parent->llink=q;
 else
  parent->rlink=q;
 freenode(cur);
 return root;
 }

void preorder(NODE root)
{
if(root!=NULL)
 {
  printf("%d\n",root->info);
  preorder(root->llink);
  preorder(root->rlink);
  }
 }
void postorder(NODE root)
{
if(root!=NULL)
 {

  postorder(root->llink);
  postorder(root->rlink);
  printf("%d\n",root->info);
  }
 }
void inorder(NODE root)
{
if(root!=NULL)
```

```
 {

  inorder(root->llink);
  printf("%d\n",root->info);
  inorder(root->rlink);
  }
 }
void main()
{
int item,choice;
NODE root=NULL;
for(;;)
{
printf("\n1.insert\n2.display\n3.pre\n4.post\n5.in\n6.delete\n7.exit\n");
printf("enter the choice\n");
scanf("%d",&choice);
switch(choice)
 {
  case 1:printf("enter the item\n");
         scanf("%d",&item);
         root=insert(root,item);
         break;
  case 2:display(root,0);
         break;
  case 3:preorder(root);
         break;
  case 4:postorder(root);
         break;
  case 5:inorder(root);
         break;
  case 6:printf("enter the item\n");
```

```
            scanf("%d",&item);
            root=delete(root,item);
            break;
    default:exit(0);
             break;
        }
    }
}
```

```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
10

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
5

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
13

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
```

```
enter the choice
2
  13
10
  5

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
12

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
36

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
    36
  13
    12
10
  5
```

```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
4

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
6

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
    36
  13
    12
10
    6
  5
    4
```

```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
2

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
15

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
    36
      15
  13
    12
10
    6
  5
    4
      2
```

```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
4
2
4
6
5
12
15
36
13
10

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
3
10
5
4
2
6
13
12
36
15
```

```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
5
2
4
5
6
10
12
13
15
36

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
6
enter the item
6

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
7

Process returned 0 (0x0)   execution time : 490.521 s
Press any key to continue.
```