

```

#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.