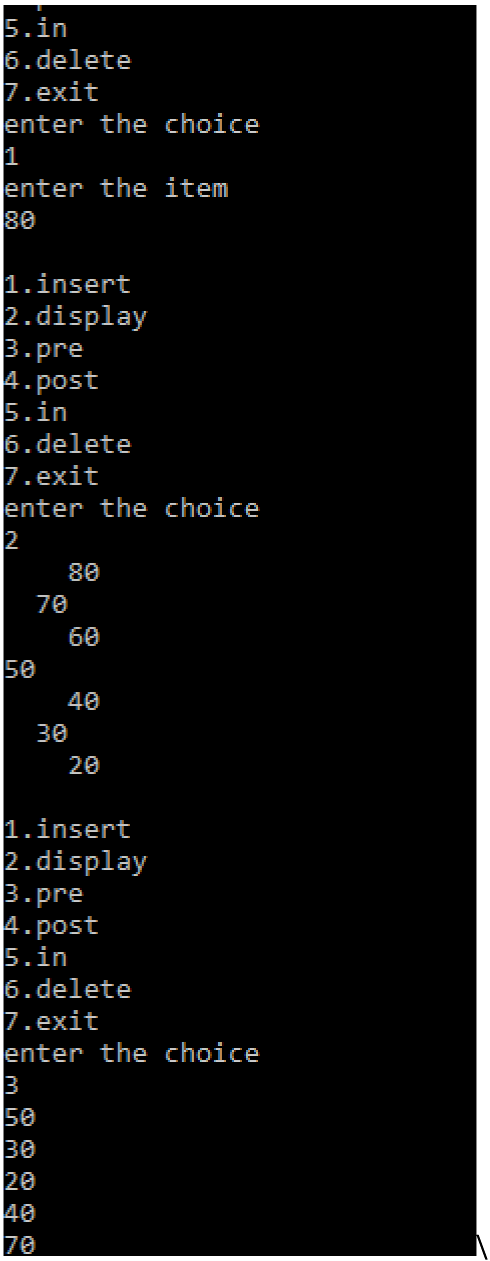
```
#include<stdio.h>

#include<stdlib.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 del(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);
  }
 }
int 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);
```

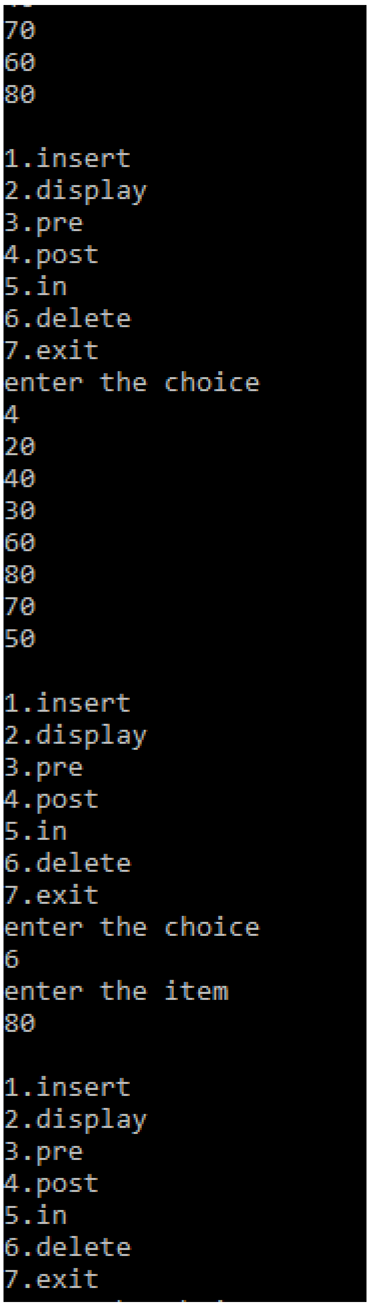
```
                         break;
  case 3:preorder(root);
                         break;
  case 4:postorder(root);
                         break;
  case 5:inorder(root);
                         break;
  case 6:printf("enter the item\n");
                         scanf("%d",&item);
                         root=del(root,item);
                         break;
  default:exit(0);
                          break;
              }
            }
 }
```

OUTPUT:

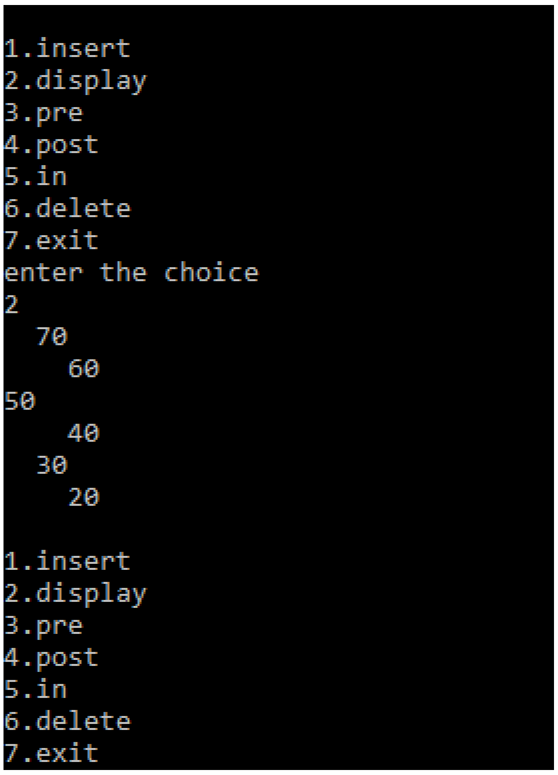


```
5.in
6.delete
7.exit
enter the choice
1
enter the item
80

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
    80
  70
    60
50
    40
  30
    20

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
3
50
30
20
40
70
```

\



```
70
60
80

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
4
20
40
30
60
80
70
50

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
6
enter the item
80

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



```

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
  70
    60
50
    40
  30
    20

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