LAB PROGRAM 10-EXECUTION

```
#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
```

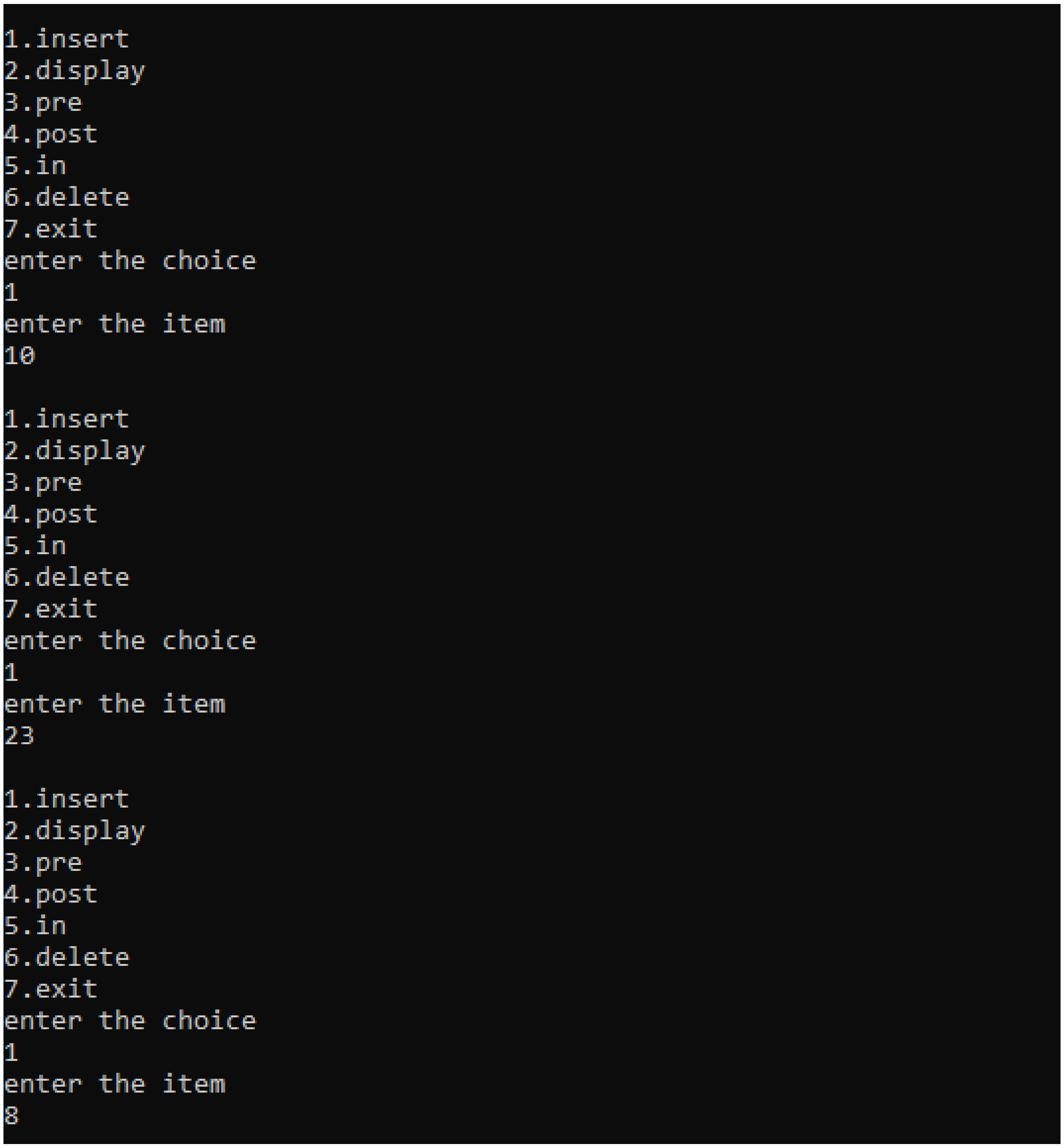
```
{
suc=cur->rlink;
while(suc->llink!=NULL)
 suc=suc->llink;
suc->llink=cur->llink;
q=cur->rlink;
}
if(parent==NULL)
 return q;
if(cur==parent->llink)
 parent->llink=q;
else
 parent->rlink=q;
freenode(cur);
return root;
}
```

```
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(;;)
```

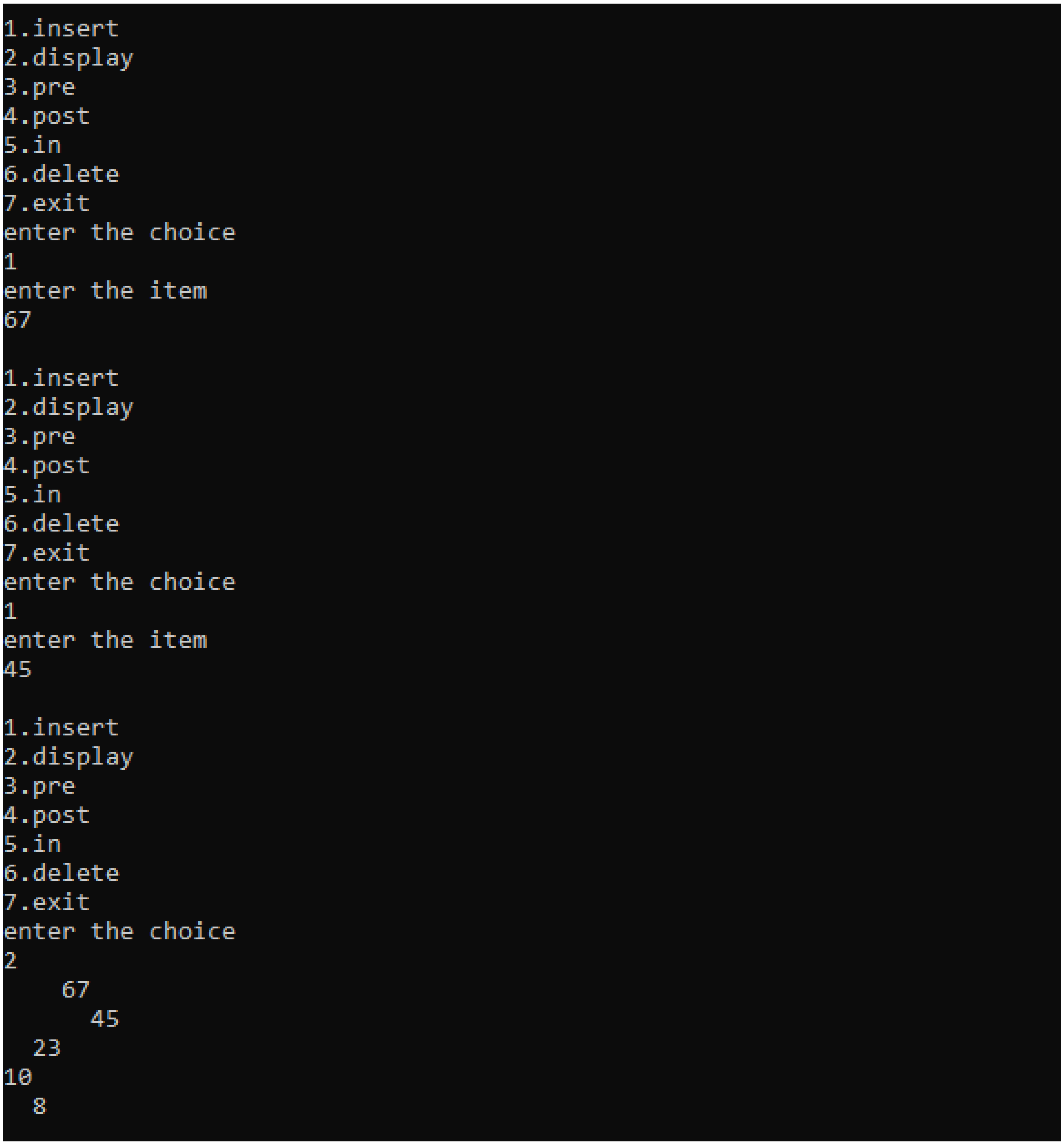
```
{
printf("\n1.insert\n2.display\n3.pre\n4.post\n5.in\n6.delete\n7.exit\n");
printf("enter the choice\n");
scanf("%d",&choice);
switch(choice)
 {
  case 1:printf("enter the item\n");
                scanf("%d",&item);
                root=insert(root,item);
                break;
  case 2:display(root,0);
                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;
         }
       }
 }
```

OUTPUT:

1. BUILD A BST:

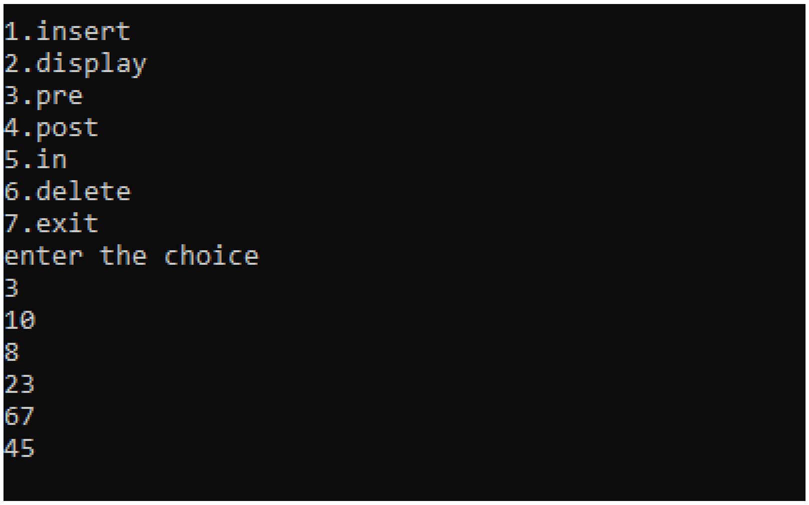


```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
10

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
23

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
8
```
]



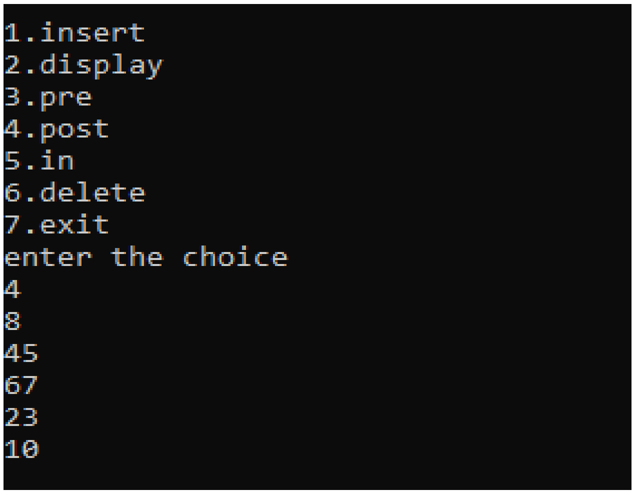
```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
67

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
1
enter the item
45

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
    67
      45
  23
10
  8
```

2. PREORDER TRAVERSAL :



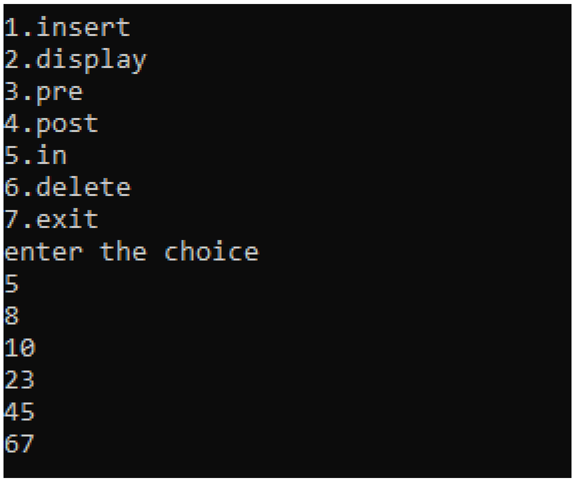
```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
3
10
8
23
67
45
```

3. POSTORDER TRAVERSAL :



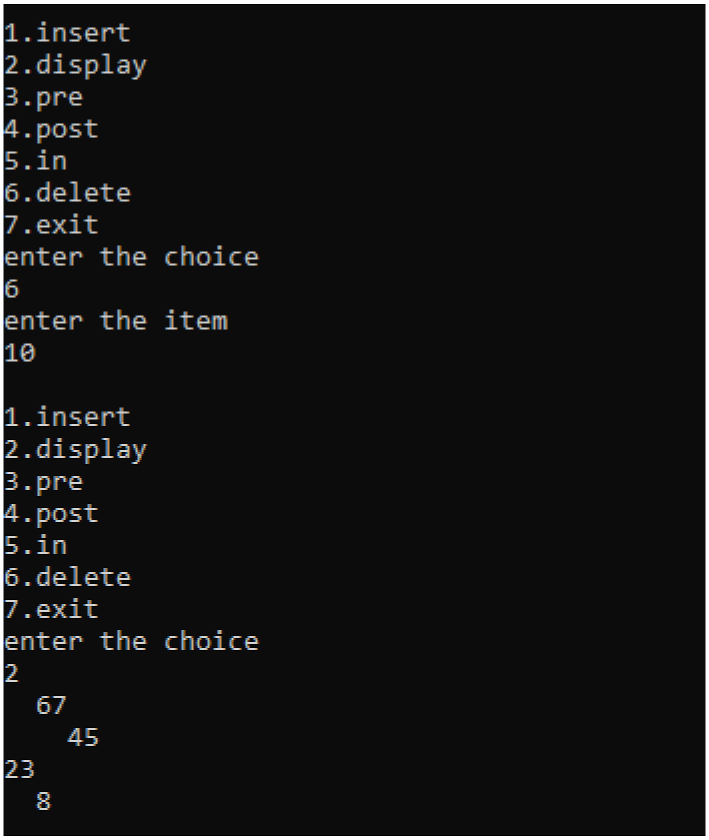
```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
4
8
45
67
23
10
```

4. INORDER TRAVERSAL :



```
1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
5
8
10
23
45
67
```

5. DELETE:



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

1.insert
2.display
3.pre
4.post
5.in
6.delete
7.exit
enter the choice
2
  67
    45
23
  8
```