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EX NO: 09
PROGRAM NAME: IMPLEMENTATION OF BINARY SEARCH TREE

CODE:

```
#include <stdio.h>
#include<stdlib.h>
struct node{
   int data;
   struct node* left;
   struct node* right;
}*first=NULL,*swap,*ptr,*prev;
int isempty(){
   if( first==NULL)
   return(1);
   else
   return(0);
}
void delelt(int elt){
   ptr=first;prev=ptr;
   while(elt!=ptr->data){
      prev=ptr;
      if(elt<ptr->data)
         ptr=ptr->left;
```

```
        else
            ptr=ptr->right;
    }
    swap=ptr;
    if(ptr->right!=NULL){
    prev=ptr;
    ptr=ptr->right;
    while(ptr->left!=NULL){
        prev=ptr;
        ptr=ptr->left;
    }
    swap->data=ptr->data;
    if(prev->left==ptr)
    prev->left=ptr->right;
    free(ptr);
    }
    else if(ptr->right==NULL){
      if(ptr->data>prev->data)
        prev->right=ptr->left;
      else
        prev->left=ptr->left;
      free(ptr);
    }
}
```

```
void inorder(struct node*ptr){
   if(ptr!=NULL)
   {
      inorder(ptr->left);
      printf("%d ",ptr->data);
      inorder(ptr->right);
   }
}
void genbintree(int elt){
   struct node* newn=malloc(sizeof(struct node));
   newn->data=elt;
   newn->right=NULL;
   newn->left=NULL;
   if(isempty()){
      first=newn;}
   else{ptr=first;
   while(ptr!=NULL){
      if(ptr->data<elt){
         prev=ptr;
         ptr=ptr->right;
      }
      else{
         prev=ptr;
         ptr=ptr->left;
```

```
        }
    }
    if(prev->data<elt)
       prev->right=newn;
    else
      prev->left=newn;
 }
}
void search(int elt){
    ptr=first;
    while(ptr->data!=elt){
        if(elt>ptr->data)
            ptr=ptr->right;
        else
            ptr=ptr->left;
        if(ptr==NULL)
            break;
    }
    if(ptr==NULL)
        printf("\nNo such element found");
    else
        printf("\n%d is found in the tree",elt);
}
 int main(){
```

```
    int elt,n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
       scanf("%d",&elt);
       genbintree(elt);
    }
    search(83);
    search(40);
    delelt(20);
    printf("\n");
    inorder(first);
 }
```

OUTPUT:

```
7
10
5
20
4
7
18
40

No such element found
40 is found in the tree
```

4 5 7 10 18 40

Process returned -1073741571 (0xC00000FD)   execution time : 20.757 s

Press any key to continue.