**15. Write a C++ program that uses functions to perform the following:**

**a) Create a binary search tree of integers.**

**b) Search for an integer key in the above binary search tree non recursively.**

**c) Search for an integer key in the above binary search tree recursively.**

#include<iostream>

using namespace std;

void insert(int,int );

void display(int);

int search(int);

int search1(int,int);

int tree[10],t=1,s,x,i;

main()

{

int ch,y;

for(i=1;i<10;i++)

tree[i]=-1;

while(1)

{

cout <<"1.INSERT\n2.DISPLAY\n3.SEARCH\n4.EXIT\nEnter your choice:";

cin >> ch;

switch(ch)

{

case 1:

cout <<"enter the element to insert";

cin >> ch;

insert(1,ch);

break;

case 2:

display(1);

cout<<"\n";

for(int i=0;i<=10;i++)

cout <<i;

cout <<"\n";

break;

case 3:

cout <<"enter the element to search:";

cin >> x;

y=search(1);

if(y == -1)

cout <<"no such element in tree";

else

cout <<x << "is in" <<y <<"position";

break;

case 4:

exit(0);

}

}

}

void insert(int s,int ch )

{

int x;

if(t==1)

{

tree[t++]=ch;

return;

}

x=search1(s,ch);

if(tree[x]>ch)

tree[2\*x]=ch;

else

tree[2\*x+1]=ch;

t++;

}

int search(int s)

{

if(t==1)

{

cout <<"no element in tree";

return -1;

}

if(tree[s]==-1)

return tree[s];

if(tree[s]>x)

search(2\*s);

else if(tree[s]<x)

search(2\*s+1);

else

return s;

}

void display(int s)

{

if(t==1)

{cout <<"no element in tree:";

return;}

for(int i=1;i<20;i++)

if(tree[i]==-1)

cout <<" ";

else cout <<tree[i];

return ;

}

int search1(int s,int ch)

{

if(t==1)

{

cout <<"no element in tree";

return -1;

}

if(tree[s]==-1)

return s/2;

if(tree[s] > ch)

search1(2\*s,ch);

else search1(2\*s+1,ch);

}