C2 – 14 – 197188 - **Path length having maximum number of bends:**

#include<iostream>

#include<vector>

**using** **namespace** std;

**typedef** **struct** btnode \* btptr;

#define null NULL

**struct** btnode{

btptr lc,rc;

**int** data;

};

**void** **insert**(btptr &t,**int** k)

{

**if**(t==null){

t=**new**(btnode);

t->data=k;

t->rc=t->lc=null;

}

**int** x;

cin>>x;

**if**(x!=**0**)insert(t->lc,x);

cin>>x;

**if**(x!=**0**)insert(t->rc,x);

}

**struct** queue{

**int** size=**100**;

**int** f=-**1**,r=-**1**;

btptr elements[**100**];

**void** **enq**(btptr t)

{

**if**((r+**1**)%size==f)**return**;

**else**{

**if**(f==-**1**)f=r=**0**;

**else** r=(r+**1**)%size;

elements[r]=t;

}

}

btptr **deq**()

{

**if**(f==-**1**)**return** null;

**else**{

btptr t;

t=elements[f];

**if**(f==r)f=r=-**1**;

**else** f=(f+**1**)%size;

**return** t;

}

}

};

**int** **bends**(**struct** queue q)

{

//r to l 0,l to r 1

**int** bends=**0**;

**int** partocur,curtochild;

btptr a,b;

**if**(q.f>=**0**)a=q.deq();

**if**(q.f>=**0**)b=q.deq();

**if**(b==a->rc)curtochild=**1**;

**else** curtochild = **0**;

partocur=curtochild;

a=b;

**while**(q.f>=**0**)

{

b=q.deq();

**if**(b==a->rc)curtochild=**1**;

**else** curtochild = **0**;

**if**(partocur!=curtochild)bends++;

partocur=curtochild;

a=b;

}

**return** bends;

}

**void** **func**(btptr t,**struct** queue cur,**struct** queue &maxbends,**int** &bend)

{

**if**(t==null)**return**;

**if**(t->lc==null && t->rc==null)

{

cur.enq(t);

**if**(bends(cur)>=bends(maxbends))

{

bend=bends(cur);

maxbends=cur;

}

**return**;

}

cur.enq(t);

func(t->lc,cur,maxbends,bend);

func(t->rc,cur,maxbends,bend);

}

**int** **main**()

{

btptr t=null;

**int** x;

cin>>x;

insert(t,x);

**struct** queue maxbends,temp;

**int** bend=**0**;

func(t,temp,maxbends,bend);

temp = maxbends;

**int** length=-**1**;

**while**(temp.f>=**0**){

length++;temp.deq();

}

cout<<"path length "<<length<<endl;

temp=maxbends;

cout<<"path is ";

**while**(temp.f!=temp.r)cout<<temp.deq()->data<<"->";

cout<<temp.deq()->data<<endl;

cout<<"the maximum number of bends is "<<bend;

**return** **0**;

}

//4 2 1 0 0 3 0 0 6 5 0 0 7 9 12 0 0 10 0 11 45 0 0 13 0 14 0 0 0

INPUT:

4 2 1 0 0 3 0 0 6 5 0 0 7 9 12 0 0 10 0 11 45 0 0 13 0 14 0 0 0

OUTPUT:

