/\* LAB ASSIGNMENT 8

Aim: Write C++ program for storing binary number using doubly linked lists. Write functions-

a) to compute 1‘s and 2‘s complement

b) add two binary numbers\*/

#include <iostream>

using namespace std;

class DLL

{

bool num;

DLL \*next;

DLL \*prev;

public:

static DLL \*start , \*end; //pointer

DLL() //constructor

{

cout<<"Enter a binary bit of number: ";

cin>>num;

next=prev=NULL;

if(start==NULL) //the list is empty

{

start=end=this; //this is the current node called by constructor

}

else //list is not empty

{

end -> next = this;

this -> prev = end;

end = this;

}

}

void Display()

{

DLL \*ptr = start;

cout<<"NULL<-";

while(ptr!=NULL)

{

cout<<ptr->num;

ptr = ptr -> next;

}

cout<<"NULL";

}

void onescomplement()

{

DLL \*ptr = start;

cout<<"\nOnes complement of binary number is: ";

while(ptr!= NULL)

{

cout<<!(ptr -> num); //! sign indicates complement of the number

ptr = ptr -> next;

}

}

void twoscomplement()

{

DLL \*ptr = end;

bool twoscomp[15];

int i=-1;

while(ptr!=NULL && ptr -> num == 0)

{

twoscomp[i]=0;

ptr = ptr -> prev;

}

twoscomp[++i]=1; //pre increament (increamentation before execution)

while(ptr!=NULL)

{

twoscomp[++i]=!(ptr -> num);

ptr = ptr -> prev;

}

cout<<"\nTwos complement of binary number is : ";

while(i >= 0 )

{

cout<<twoscomp[i--]; ////post increament (increamentation after execution)

}

}

};

DLL \*DLL::start = NULL;

DLL \*DLL::end = NULL;

int main ()

{

DLL \*obj;

int choice;

while(1)

{

cout<<"\nMENU ";

cout<<"\n 1. Add bit into binary number";

cout<<"\n 2. Display";

cout<<"\n 3. One's complement ";

cout<<"\n 4. Two's complement ";

cout<<"\n 5. Exit";

cout<<"\n Enter your choice";

cin>>choice;

switch(choice)

{

case 1:

obj = new DLL();

break;

case 2:

obj -> Display();

break;

case 3:

obj -> onescomplement();

break;

case 4:

obj -> twoscomplement();

break;

case 5:

exit(0);

}

}

return 0;

}