**PROGRAM:**

#include<iostream>

#include<conio.h>

#include<bitset>

using namespace std;

class logic\_gate

{public:

int a , b, x;

void table(int c);

void oper(int c);

logic\_gate()

{ a=0;

b=0;

}

void getdata()

{ cout<<"\n\tEnter the first input:\t";

cin>>a;

cout<<"\n\tEnter the second input:\t";

cin>>b;

}

void getndata()

{ cout<<"\n\tEnter one input:\t";

cin>>a;

b=1;

}

void operator \* ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a)<<"\t\t B = "<<std::bitset<8>(b);

x = a&b;

cout<<"\n\n\t\tA AND B = "<<std::bitset<8>(x);

}

void operator - ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a)<<"\t\t B = "<<std::bitset<8>(b);

x = a|b;

cout<<"\n\n\t\tA OR B = "<<std::bitset<8>(x);

}

void operator -- ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a);

x = ~a;

cout<<"\n\n\t\tNOT A = "<<std::bitset<8>(x);

}

void operator + ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a)<<"\t\t B = "<<std::bitset<8>(b);

x = a&b;

cout<<"\n\n\t\tA NAND B = "<<std::bitset<8>(~x);

}

void operator ! ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a)<<"\t\t B = "<<std::bitset<8>(b);

x = a|b;

cout<<"\n\n\t\tA NOR B = "<<std::bitset<8>(~x);

}

void operator ++ ()

{

cout<<"\n\t\tA = "<<std::bitset <8> (a)<<"\t\t B = "<<std::bitset<8>(b);

x = a^=b;

cout<<"\n\n\t\tA XOR B = "<<std::bitset<8>(x);

}

};

void logic\_gate::table(int c)

{switch(c)

{case 1:cout<<"\n\t\t\tTRUTH TABLE - AND(&) (IC-7408)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | INPUT B | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 0 | 0 |\n";

cout<<"\t\t\t| 0 | 1 | 0 |\n";

cout<<"\t\t\t| 1 | 0 | 0 |\n";

cout<<"\t\t\t| 1 | 1 | 1 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~";

break;

case 2: cout<<"\n\t\t\tTRUTH TABLE - OR(|) (IC-7432)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | INPUT B | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 0 | 0 |\n";

cout<<"\t\t\t| 0 | 1 | 1 |\n";

cout<<"\t\t\t| 1 | 0 | 1 |\n";

cout<<"\t\t\t| 1 | 1 | 1 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~";

break;

case 3: cout<<"\n\t\t\tTRUTH TABLE - NOT(~) (IC-7404)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 1 |\n";

cout<<"\t\t\t| 1 | 0 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~";

break;

case 4: cout<<"\n\t\t\tTRUTH TABLE - NAND(~&) (IC-7400)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | INPUT B | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 0 | 1 |\n";

cout<<"\t\t\t| 0 | 1 | 1 |\n";

cout<<"\t\t\t| 1 | 0 | 1 |\n";

cout<<"\t\t\t| 1 | 1 | 0 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~";

break;

case 5: cout<<"\n\t\t\tTRUTH TABLE - NOR(~|) (IC-7402)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | INPUT B | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 0 | 1 |\n";

cout<<"\t\t\t| 0 | 1 | 0 |\n";

cout<<"\t\t\t| 1 | 0 | 0 |\n";

cout<<"\t\t\t| 1 | 1 | 0 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~";

break;

case 6: cout<<"\n\t\t\tTRUTH TABLE - XOR(^=) (IC-7486)\n\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| INPUT A | INPUT B | OUTPUT C |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~\n";

cout<<"\t\t\t| 0 | 0 | 0 |\n";

cout<<"\t\t\t| 0 | 1 | 1 |\n";

cout<<"\t\t\t| 1 | 0 | 1 |\n";

cout<<"\t\t\t| 1 | 1 | 0 |\n";

cout<<"\t\t\t~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~";

break;

default: cout<<"\nPlease enter a valid choice!";

}}

void logic\_gate:: oper(int c)

{

switch(c)

{case 1: {logic\_gate andd;

andd.getdata();

\*andd;

break;}

case 2: {logic\_gate orr;

orr.getdata();

-orr;

break;}

case 3: {logic\_gate nott;

nott.getndata();

--nott;

break; }

case 4: {logic\_gate nandd;

nandd.getdata();

+nandd;

break; }

case 5: {logic\_gate norr;

norr.getdata();

!norr;

break;}

case 6:{logic\_gate xorr;

xorr.getdata();

++xorr;

break;}

default: cout<<"\nPlease enter a valid choice!";

}}

main()

{logic\_gate ob;

int ch1, ch2;

cout<<"\n\t\t\t\*\*\* LOGIC OPERATIONS TRIAL HUB \*\*\*";

cout<<"\n\n\t[NOTE: Enter choice number while choosing from any menu.]";

cout<<"\n\n\tMENU:\n\t1)View truth table\n\t2)Perform Operation\n\t3)Exit";

while(1)

{cout<<"\n\n\tYour Choice:\t";

cin>>ch1;

switch(ch1)

{case 1: cout<<"\n\tGATES:\n\t1)AND (&)\n\t2)OR (|)\n\t3)NOT (~)\n\t4)NAND (~&)\n\t5)NOR (~|)\n\t6)EXOR (^=)";

cout<<"\n\n\tChoose Gate:\t";

cin>>ch2;

ob.table(ch2);

break;

case 2: cout<<"\n\tGATES:\n\t1)AND (&)\n\t2)OR (|)\n\t3)NOT (~)\n\t4)NAND (~&)\n\t5)NOR (~|)\n\t6)EXOR (^=)";

cout<<"\n\n\tChoose Gate:\t";

cin>>ch2;

ob.oper(ch2);

break;

case 3: cout<<"\n\n\t~\*~\*~\*~\*~ THANK YOU! PLEASE VISIT AGAIN. ~\*~\*~\*~\*~";

exit(0);

default: cout<<"\nPlease enter a valid choice!";

}}

getch();

return 0;

}