import java.util.\*;

import java.lang.Math;

// class containing all functions

class allFunctions

{

// function for binary to decimal conversion

public int BintoDec( int num)

{

int b = num;

int ans =0, i = 0;

while( b != 0)

{

int digit = b%10;

if( digit == 1)

{

ans = ans + pow (2,i);

}

b = b/10;

i++;

}

return ans;

}

// function for Decimal to binary conversion

public int DectoBin( int num)

{

int n = num;

int ans = 0;

int i = 0;

while( n!=0)

{

int bit = n & 1;

ans = (bit \* pow(10, i) ) + ans;

n = n >> 1;

i++;

}

return ans;

}

// function to find number of bits in given binary number

public int noOfBits( int num)

{

int n=num;

int count = 0;

while ( n!=0)

{

if( n&1==1)

{

count++;

}

n=n>>1;

}

return count;

}

// function to add binary numbers

public int BinAdd( int n1, int n2)

{

int a,b,c;

a=BintoDec(n1);

b=BintoDec(n2);

c=a+b;

int d=DectoBin(c);

return d;

}

// function to substract two binary numbers

public int BinSub( int n1, int n2)

{

int a,b,c;

a=BintoDec(n1);

b=BintoDec(n2);

c=a-b;

int d=DectoBin(c);

return d;

}

// function to multiply two binary numbers

public int BinMult( int n1, int n2)

{

int a,b,c;

a=BintoDec(n1);

b=BintoDec(n2);

c=a\*b;

int d=DectoBin(c);

return d;

}

// function to divide two binary numbers

public int BinDiv( int n1, int n2)

{

int a,b;

a=BintoDec(n1);

b=BintoDec(n2);

float c=float(a)/(b);

int d=DectoBin(c);

return d;

}

// function to find 1's compliment of given binary

public void Bin\_1s\_complement( int arr[], int size )

{

int newarray[]=new int[8];

int j=0;

for( j=0;j<size;j++)

{

if(arr[j]==1)

{

newarray[j]=0;

}

else if(arr[j]==0)

{

newarray[j]=1;

}

}

for(int k=0; k < size ; k++)

{

System.out.println( newarray[k] + "/n");

}

}

// function to convert decimal to octal conversion

public int DecToOcta(int num)

{

int n=num;

int digit=0,i=0,ans=0;

while(n!=0)

{

digit=n%8;

ans = ans + digit\*pow(8,i);

n=n/10;

i=i\*10;

}

return ans;

}

// function to convert binary to octal conversion

public int BintoOcta(int num)

{

int n=num;

int p=BintoDec(num);

int answer=DecToOcta(p);

return answer;

}

// function to convert octal to decimal conversion

public int OctatoDec(int num)

{

int n=num;

int digit=0,i=0,ans=0;

while(n!=0)

{

digit=n%10;

ans=ans+digit\*pow(8,i);

n=n/10;

i++;

}

return ans;

}

// function to convert octal to binary conversion

public int OctatoBin(int num)

{

int n= num;

int p=OctatoDec(n);

int answer=DectoBin(n);

return answer;

}

}

public class miniProjectinjava extends allFunctions

{

public static void main(String[] args)

{

int choice;

//taking input from user to perform a task

Scanner s=new Scanner(System.in);

miniProjectinjava a=new miniProjectinjava();

System.out.println(" Welcome to Binary CODE HELPER -!!! \n");

System.out.println(" Enter choice \n");

System.out.println(" Enter 1 for Binary to decimal conversion \n");

System.out.println(" Enter 2 for Decimal to binary conversion \n");

System.out.println(" Enter 3 to find no. of setbits in number \n");

System.out.println(" Enter 4 for Binary addition \n");

System.out.println(" Enter 5 for Binary substraction \n" );

System.out.println(" Enter 6 for Binary multiplication \n");

System.out.println(" Enter 7 for Binary division \n");

System.out.println(" Enter 8 to find 1's complement of binary \n");

System.out.println(" Enter 9 to find decimal to octal conversion \n");

System.out.println(" Enter 10 to find binary to octal conversion \n" );

System.out.println(" Enter 11 to find octal to decimal conversion \n" );

System.out.println(" Enter 12 to find octal to binary conversion \n");

choice=s.nextInt() ;

switch (choice)

{

case 1: { int number;

System.out.println(" Enter input \n");

number=s.nextInt();

System.out.println(" Decimal value for this binary is: \n") ;

System.out.println(a.BintoDec( number));

break;

}

case 2: { int number;

System.out.println(" Enter input \n");

number=s.nextInt();

System.out.println(" Binary reprentation for this decimal number is: \n") ;

System.out.println(a.DectoBin( number));

break;

}

case 3: {

int number;

System.out.println( " Enter input decimal number: \n") ;

number=s.nextInt();

System.out.println("No. of setbits are : \n" + a.noOfBits(number));

break;

}

case 4: { int num1,num2;

System.out.println (" Enter binary no.1 \n ");

num1=s.nextInt();

System.out.println(" Enter binary no.2 \n" );

num2=s.nextInt();

System.out.println(" Binary addition is: " + a.BinAdd(num1,num2)) ;

break;

}

case 5: { int num1,num2;

System.out.println(" Enter binary no.1 \n" );

num1=s.nextInt();

System.out.println(" Enter binary no.2 \n");

num2=s.nextInt();

System.out.println(" Binary substraction is: " + a.BinSub(num1,num2));

break;

}

case 6: { int num1,num2;

System.out.println(" Enter binary no.1 \n");

num1=s.nextInt();

System.out.println(" Enter binary no.2 \n");

num2=s.nextInt();

System.out.println(" Binary multiplication is: " + a.BinMult(num1,num2)) ;

break;

}

case 7: { int num1,num2;

System.out.println(" Enter binary no.1 \n" );

num1=s.nextInt();

System.out.println(" Enter binary no.2 \n" );

num2=s.nextInt();

cSystem.out.println(" Binary division is: " + a.BinDiv(num1,num2));

break;

}

case 8: { int number[] = new int[8];

System.out.println(" Enter the 8 digit binary number \n");

System.out.println(" please input space after every input \n");

for(int i=0; i<8;i++)

{

number[i]=s.nextInt();

}

a.Bin\_1s\_complement( number , 8);

break;

}

case 9: {

System.out.println(" enter decimal input \n");

int number;

number=s.nextInt();

System.out.println("Decimal to octal conversion for this decimal is:" + a.DecToOcta(number) + "\n") ;

break;

}

case 10: {

System.out.println(" enter binary input \n");

int number;

number=s.nextInt();

System.out.println("Binary to octal conversion for this decimal is:" + a.BintoOcta(number) + "\n");

break;

}

case 11: {

System.out.println(" enter octal input \n");

int number;

number=s.nextInt();

System.out.println("Octal to decimal conversion for this decimal is:" + a.OctatoDec(number) + "\n");

break;

}

case 12: {

System.out.println(" enter octal input \n");

int number;

number=s.nextInt();

System.outprintln("Octal to binary conversion for this decimal is:" + a.OctatoBin(number) + "\n");

break;

}

default: {

System.out.println (" Invalid choice entered. Thank you and try again . ");

break;

}

}

System.out.println(" \n \n End of program , Final Thank you \n");

}

}