

Project Based Learning(PBL) Report
Decimal_Binary_Octal_HexaDecimal Converter
(DBOH-Converter)



BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING

Under the esteemed guidance of

Mr. S Ramanjaneyulu
(Object Oriented Programming-Faculty)

By

E.Sai kiran(22R15A0514)
B.Prabhakar(22R15A0514)



Department of Computer Science and Engineering
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Geethanjali College of Engineering and Technology
(UGC Autonomous)
(Affiliated to J.N.T.U.H, Approved by AICTE, New Delhi)
Cheeryal (V), Keesara (M), Medchal.Dist.-501 301.
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Geethanjali College of Engineering & Technology
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DECLARATION BY THE CANDIDATE

I/We **E.Sai kiran(22R15A0514), B.Prabhakar(22R15A0513)**, hereby declare that the PBL report entitled “**Decimal_Binary_Octal_HexaDecimal Converter** ” is done under the guidance of, **Mr. S Ramajaneyulu (Object Oriented Programming[JAVA]-Faculty)** , Department of Computer Science and Engineering, Geethanjali College of Engineering and Technology.

**E.Sai kiran(22R15A0514),
B.Prabhakar(22R15A0513)**

Department of CSE,

Geethanjali College of Engineering and Technology, Cheeryal.

Geethanjali College of Engineering & Technology

(UGC Autonomous)

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Cheeryal (V), Keesara(M), MedchalDist.-501 301.

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CERTIFICATE

This is to certify that the B.Tech Project Based Learning(BPL) report entitled “Decimal_Binary_Octal_HexaDecimal Converter” is a bonafide work submitted by Ejumalla Saikiran(22R15A0514), Banala Prabhakar(22R15A0514), under the course of OBJECT PRIENTED PROGRAMMING [JAVA].

Course Instructor

Mr.S Ramanjaneyulu

HOD-CSE

Dr.A.Sree Lakshmi

Professor

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ABSTRACT

My project is the type of converter which is designed by java using GUI interfaces with the help of AWT Components is to convert one number system [radix] to other number system [radix].like:

1. Decimal->Binary
2. Decimal->Octal
3. Decimal->Hex
4. Binary->Decimal
5. Binary->Octal
6. Binary->Hex
7. Octal->Decimal
8. Octal->Binary
9. Octal->Hex
10. Hex->Decimal
11. Hex->Binary
12. Hex->Octal

Above mentioned all twelve conversions are done by using the simple graphical user interface [GUI] which user feels easy to use. And in this all possible conversions are covered.

CHAPTER 1

INTRODUCTION

➤ What is Decimal_Binary_Octal_Hex Converter?

The process of converting the four types of number system in one interface is called DBOH-Converter.

The four types of Number Systems are:

1. Decimal Number System. {0-9 digits}
2. Binary Number System. {0, 1 digits}
3. Octal Number System. { 0-7 digits }
4. HexaDecimal Number System. {0-9 and A-F}

.

➤ Required Software Material:

- Java software
- Knowledge on AWT package usages.

➤ Required Hardware Material:

- Windows that supports Java .

CHAPTER 2

PROGRAM CODE FOR CONVERTER

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

class BNS extends JFrame implements ActionListener
{
    JTextField tf1,tf2;JLabel l1,l2;
    JButton b1;Choice c1,c2;
//Frame Properties
    public BNS()
    {
        setSize(600,600);
        setVisible(true);
        setTitle("BINARY_NUMBER_SYSTEM");
        setLayout(null);
        tf1=new JTextField(20);
        tf2=new JTextField(20);
        l1=new JLabel("Value");
        l2=new JLabel("Result");
        b1=new JButton("Convert");
        c1=new Choice();
        c1.add("Decimal");
        c1.add("Binary");
        c1.add("Octal");
        c1.add("HexaDecimal");

        c2=new Choice();
        c2.add("Decimal");
        c2.add("Binary");
        c2.add("Octal");
        c2.add("HexaDecimal");

        add(l1);add(tf1);add(c1);add(b1);add(c2);add(l2);add(tf2);
        l1.setBounds(100,100,100,50);
        tf1.setBounds(200,100,100,50);
        c1.setBounds(50,200,100,50);
        b1.setBounds(200,200,100,35);
        c2.setBounds(350,200,100,50);
        l2.setBounds(100,300,100,50);
        tf2.setBounds(200,300,100,50);
        b1.addActionListener(this);
    }
}
```



```

    }

    public void actionPerformed(ActionEvent ae)
    {
        Object obj=ae.getSource();

        if(obj==b1)
        {

            tf1.getText();
            String ch1="" + c1.getItem(c1.getSelectedIndex());
            String ch2="" + c2.getItem(c2.getSelectedIndex());
            String bin="Binary";
            String dec="Decimal";
            String oct="Octal";
            String hex="Hexadecimal";

            //BINARY TO DECIMAL
            if((ch1.equals(bin)) && (ch2.equals(dec)))
            {
                int num=Integer.parseInt(tf1.getText());
                int lastDigit, decimal=0, i=0;
                while(num>0)
                {
                    lastDigit = num%10;
                    decimal += Math.pow(2,i) * lastDigit;
                    num=num/10;
                    i++;
                }
                tf2.setText("" + decimal);
            }

            //DECIMAL TO BINARY
            if((ch1.equals(dec)) && (ch2.equals(bin)))
            {
                int num=Integer.parseInt(tf1.getText());

                int i=1, binary=0, rem;
                while(num!=0){
                    rem = num%2;
                    binary += i*rem;
                    num = num/2;
                    i=i*10;
                }
                tf2.setText("" + binary);
            }

```

//DECIMAL TO OCTAL

```
if((ch1.equals(dec))&&(ch2.equals(oct)))
{
    int num=Integer.parseInt(tf1.getText());
    int octal=0, i=1, remainder;
    while(num>0)
    {
        remainder = num%8;
        octal += i*remainder;
        num = num/8;
        i=i*10;
    }
    tf2.setText(""+octal);
}
```

//DECIMAL TO HEXA DECIMAL

```
if((ch1.equals(dec))&&(ch2.equals(hex)))
{
    int num=Integer.parseInt(tf1.getText());
    char ch[]={'0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'};
    int rem;
    String hexadecimal="";
    while(num != 0)
    {
        rem=num%16;
        hexadecimal= ch[rem] + hexadecimal;
        num= num/16;
    }
    tf2.setText(""+hexadecimal);
}
```

//BINARY TO OCTAL

```
if((ch1.equals(bin))&&(ch2.equals(oct)))
{
    int num=Integer.parseInt(tf1.getText());
    int deci = 0, i = 0;
    while (num > 0)
    {
        deci += Math.pow(2, i++) * (num % 10);
        num /= 10;
    }
    int decimalNumber = deci;
    String octalString = Integer.toOctalString(decimalNumber);
    int octalNumber = Integer.parseInt(octalString);
    tf2.setText(""+octalNumber);
}
```

//BINARY TO HEXA-DECIMAL

```
if((ch1.equals(bin))&&(ch2.equals(hex)))
{
    int num=Integer.parseInt(tf1.getText());
    int dNum = 0, i = 0;
    while (num > 0)
    {
        dNum += Math.pow(2, i++) * (num % 10);
        num /= 10;
    }
    String hexNumber
        = Integer.toHexString(dNum);
    hexNumber = hexNumber.toUpperCase();

    tf2.setText(""+hexNumber);
}
```

//OCTAL TO BINARY

```
if((ch1.equals(oct))&&(ch2.equals(bin)))
{
    int num=Integer.parseInt(tf1.getText());
    int d = 0, i = 0;
    long bn = 0;

    while (num != 0)
    {
        d += (num % 10) * Math.pow(8, i);
        ++i;
        num /= 10;
    }

    i = 1;

    while (d!= 0)
    {
        bn += (d % 2) * i;
        d /= 2;
        i *= 10;
    }

    tf2.setText(""+bn);
}
```

//OCTAL TO DECIMAL

```
if((ch1.equals(oct))&&(ch2.equals(dec)))
{
    int num=Integer.parseInt(tf1.getText());
    String octalString=String.valueOf(num);

    int decim=Integer.parseInt(octalString,8);

    tf2.setText(""+decim);
}
```

//OCTAL TO HEXA-DECIMAL

```
if((ch1.equals(oct))&&(ch2.equals(hex)))
{
    int num=Integer.parseInt(tf1.getText());
    String inputNumber = String.valueOf(num);

    int decimalN = Integer.parseInt(inputNumber, 8);

    String hexadecimalNumber = Integer.toHexString(decimalN);
    tf2.setText(""+hexadecimalNumber);

}
```

//HEXA-DECIMAL TO DECIMAL

```
if((ch1.equals(hex))&&(ch2.equals(dec)))
{

    String hexad=String.valueOf(tf1.getText());
    int decimalNum=Integer.parseInt(hexad,16);
    tf2.setText(""+decimalNum);

}
```

//HEXA-DECIMAL TO BINARY

```
    if((ch1.equals(hex))&&(ch2.equals(bin)))
    {
        String hexade=String.valueOf(tf1.getText());
        int decimalNum=Integer.parseInt(hexade,16);

        int i=1, by=0, rem;
        while(decimalNum!=0){
            rem = decimalNum%2;
            by += i*rem;
            decimalNum = decimalNum/2;
            i=i*10;
        }
        tf2.setText(""+by);

    }
```

//HEXA-DECIMAL TO OCTAL

```
    if((ch1.equals(hex))&&(ch2.equals(oct)))
    {
        String hexadec=String.valueOf(tf1.getText());
        int decimalNumb=Integer.parseInt(hexadec,16);
        int o=0, i=1, remainder;
        while(decimalNumb>0)
        {
            remainder = decimalNumb%8;
            o += i*remainder;
            decimalNumb = decimalNumb/8;
            i=i*10;
        }
        tf2.setText(""+o);

    }

    }//END IF
} //END AP
public static void main(String args[])
{
    BNS b=new BNS();
}
}
```

CHAPTER-3

PROJECT

7.1 PROJECT (Advanced Technologies):

Name: Decimal_Binary_Octal_Hex Converter

My project is a converter which can be used to convert one number system to other number system. It is useful when u need to save the time while working on Number System Conversions.

7.2 Technologies Used:

→ Java jdk 16.0.2

Operating System: Windows 7/8/8.1/10

Team Size: 2

7.3 TECHNICAL DETAILS:

→ The project back end is java and front end is java[awt] GUI interface.

JAVA Language:

Java is a widely-used programming language for coding web applications. It has been a popular choice among developers for over two decades, with millions of Java applications in use today. Java is a multi-platform, object-oriented, and network-centric language that can be used as a platform in itself. It is a fast, secure, reliable programming language for coding everything from mobile apps and enterprise software to big data applications and server-side technologies.

What is Java programming language used for?

Because Java is a free-to-use and a versatile language, it builds localized and distributed software. Some common uses of Java include:

1. Game Development

Many popular mobile, computer, and video games are built in Java. Even modern games that integrate advanced technology like machine learning or virtual reality are built with Java technology.

2. Cloud computing

Java is often referred to as WORA – Write Once and Run Anywhere, making it perfect for decentralized cloud-based applications. Cloud providers choose Java language to run programs on a wide range of underlying platforms.

3. Big Data

Java is used for data processing engines that can work with complex data sets and massive amounts of real-time data.

4. Artificial Intelligence

Java is a powerhouse of machine learning libraries. Its stability and speed make it perfect for artificial intelligence application development like natural language processing and deep learning.

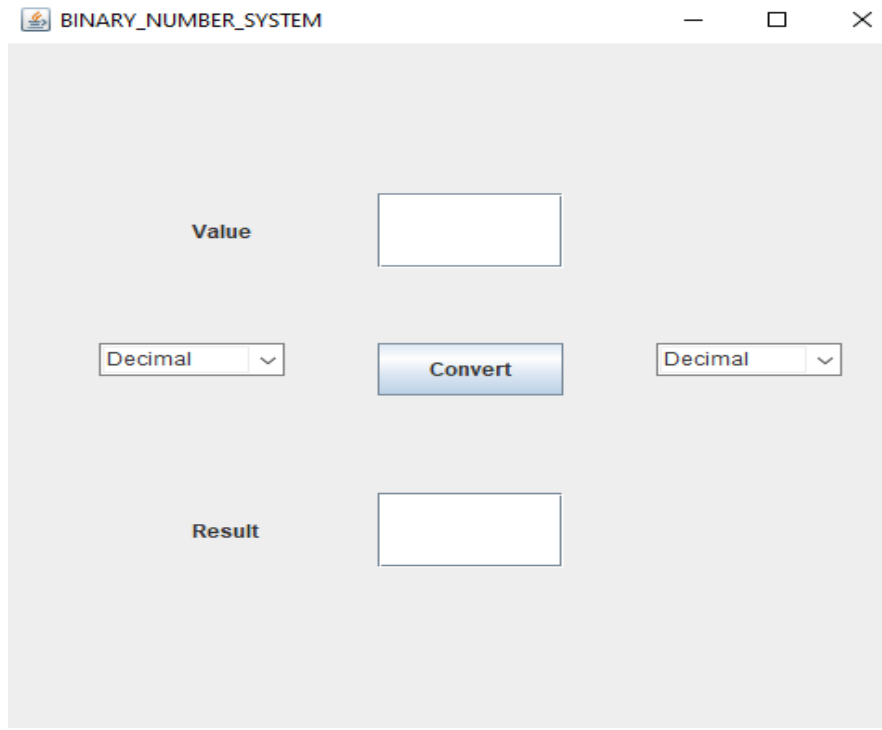
5. Internet of Things

Java has been used to program sensors and hardware in edge devices that can connect independently to the internet.

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CHAPTER-4 SCREENSHOTS

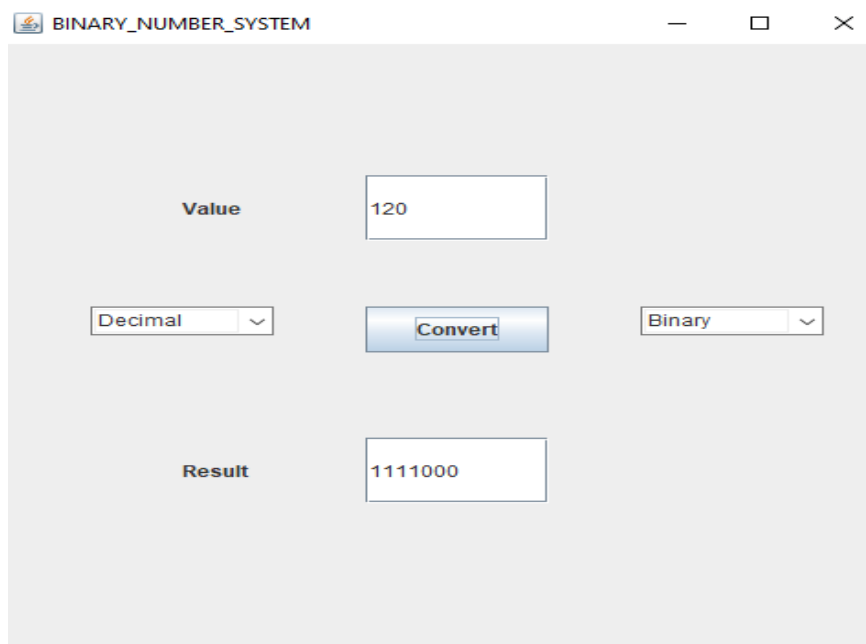
INTERFACE FORMAT:



The screenshot shows a window titled "BINARY_NUMBER_SYSTEM" with a standard Windows-style title bar (minimize, maximize, close buttons). The interface is a light gray rectangle. It contains the following elements:

- A label "Value" positioned to the left of a white rectangular input box.
- A dropdown menu below the input box, currently showing "Decimal" with a downward arrow.
- A blue button with the text "Convert" in the center.
- A dropdown menu to the right of the button, also showing "Decimal" with a downward arrow.
- A label "Result" positioned to the left of a white rectangular output box.


DECIMAL - BINARY:



This screenshot shows the same "BINARY_NUMBER_SYSTEM" window after a conversion. The elements are the same as in the first screenshot, but with the following data entered:

- The "Value" input box now contains the text "120".
- The left dropdown menu remains set to "Decimal".
- The "Convert" button is still present and active.
- The right dropdown menu is now set to "Binary".
- The "Result" output box now contains the text "1111000".


DECIMAL - OCTAL:

 BINARY_NUMBER_SYSTEM

Value

Result


DECIMAL - HEX:

 BINARY_NUMBER_SYSTEM

Value

Result

BINARY - DECIMAL:

 BINARY_NUMBER_SYSTEM—□×

Value

10110

Binary

▼

Convert


Decimal

▼

Result

22

BINARY - OCTAL:

 BINARY_NUMBER_SYSTEM—□×

Value

10110

Binary

▼

Convert


Octal

▼

Result

26


BINARY - HEX:

 BINARY_NUMBER_SYSTEM — □ ×

Value

Result


OCTAL - DECIMAL:

 BINARY_NUMBER_SYSTEM — □ ×

Value

Result


OCTAL - BINARY:

 BINARY_NUMBER_SYSTEM

Value

Result


OCTAL - HEX:

 BINARY_NUMBER_SYSTEM

Value

Result


HEX - DECIMAL:

 BINARY_NUMBER_SYSTEM

Value

Result


HEX - BINARY:

 BINARY_NUMBER_SYSTEM

Value

Result

HEX - OCTAL:

 BINARY_NUMBER_SYSTEM—□×

Value

ab

HexaDecimal ▾

Convert

Octal ▾

Result

253

CHAPTER-5

CONCLUSION

This project is the demo for that our requirements of tasks and problems are solved by the computer system using programming language. Our skills in programming language are expressed in solving our task in finite number of steps without any ambiguity ,Logical and Syntax Errors.

In this project the value is given by the user and the result will printed by the system It helps user to save the time in conversions.

CHAPTER-6

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