

About:

[Code Editor: Sublime Text]

- We have implemented concepts from digital Electronics that we studied in our earlier semester through java programming.
- This is a very simple logical project design that performs circuit operations through CLI or command line interface programming.
- Operations: 1's and 2's complement

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CODE:

```

//*****
//          HEADER FILE USED IN PROJECT
//*****
import java.util.Scanner;

//*****
//          CLASS Declaration IN PROJECT
//*****
public class ComplementCalculator
{
    static final int size = 4;
    Scanner sc = new Scanner(System.in);
    int ch;
    //int binary, decimal;
    char[] binary = new char[size+1];
    char[] one = new char[size+1];
    char[] two = new char[size+1];
    int i, carry = 1, fail = 0;

//*****
//    INTRODUCTION FUNCTIONS
//*****
    void Project_Intro()
    {
        System.out.println("\n\n\tComplement Calculator");
        System.out.println("\n\n\tPerforms following Complements");
    }

    void Intro2()
    {
        System.out.println("1| 1's |2| 2's |");
        System.out.print("Enter Choice: ");
        ch = sc.nextInt();
    }

//*****
//    Decision FUNCTION
//*****
    void Decision()

```

```
        {
            if(ch == 1)
            {
                getInput_Comp1and2();
                check();
                Evaluate();
                Complement1();
            }

            else if(ch == 2)
            {
                getInput_Comp1and2();
                check();
                Evaluate();
                Complement2();
            }
            else
                System.out.println("Enter Valid Choice!!");
        }

//*****
//    Input FUNCTION
//*****

    void getInput_Comp1and2()
    {
        System.out.print("Input a 4 bit binary number: ");
        binary = sc.next().toCharArray();
    }

//*****
//    Correction FUNCTION
//*****

    void check()
    {
        for (i = 0; i < size; i++)
        {
            if (binary[i] == '1') {
                one[i] = '0';
            } else if (binary[i] == '0') {
                one[i] = '1';
            }
        }
    }
}
```

```

    } else {
        System.out.println("Error! Input the number of assigned bits.");
        fail = 1;
        break;
    }
}
one[size] = '\0';
}

//*****
//    Evaluation FUNCTIONS
//*****

    void Evaluate()
    {
        for (i = size - 1; i >= 0; i--)
        {
            if (one[i] == '1' && carry == 1) {
                two[i] = '0';
            } else if (one[i] == '0' && carry == 1) {
                two[i] = '1';
                carry = 0;
            } else {
                two[i] = one[i];
            }
        }
        two[size] = '\0';
    }

    void Complement1(){
        if (fail == 0)
        {
            System.out.print("The original binary = ");
            for (char c:binary) {
                System.out.print(c);
            }
            System.out.println();

            System.out.print("After ones complement the value = ");
            for (char c:one) {
                System.out.print(c);
            }
        }
    }
}

```

```
    }
    System.out.println();

}

}

void Complement2()
{
    System.out.print("The original binary = ");
    for (char c:binary) {
        System.out.print(c);
    }
    System.out.println();

    System.out.print("After twos complement the value = ");
    for (char c:two) {
        System.out.print(c);
    }
    System.out.println();
}

//*****
//    THE MAIN FUNCTION OF PROGRAM
//*****

    public static void main(String args[])
    {
        ComplementCalculator obj = new ComplementCalculator();
        obj.Project_Intro();
        obj.Intro2();
        obj.Decision();
    }
}

//*****
//    END OF PROJECT
//*****
```

OUTPUT

```
yakshangi@yakshangi: ~/General/INDUS/Sem 4/Java/Mini
yakshangi@yakshangi:~/General/INDUS/Sem 4/Java/Mini$ java ComplementCalculator

Complement Calculator

Performs following Complements
1| 1's |
2| 2's |
Enter Choice: 1
Input a 4 bit binary number: 1010
The original binary = 1010
After ones complement the value = 0101
yakshangi@yakshangi:~/General/INDUS/Sem 4/Java/Mini$ |
```

```
yakshangi@yakshangi: ~/General/INDUS/Sem 4/Java/Mini
yakshangi@yakshangi:~/General/INDUS/Sem 4/Java/Mini$ java ComplementCalculator

Complement Calculator

Performs following Complements
1| 1's |
2| 2's |
Enter Choice: 2
Input a 4 bit binary number: 1010
The original binary = 1010
After twos complement the value = 0110
yakshangi@yakshangi:~/General/INDUS/Sem 4/Java/Mini$ |
```