

# PRACTICE PROGRAMS FOR TCS BY SHUBHAM THAKARE

Guided By, Prof. Vediya Raghuvanshi

## ARITHMETIC OPERATIONS WITHOUT USING OPERATORS

### 1. Addition

```
public void Add(int x, int y)
{
    // Iterate till there is no carry
    while (y != 0)
    {
        // carry now contains common set bits of x and y
        int carry = x & y;

        // Sum of bits of x and y where at least one of the bits is not set
        x = x ^ y;

        // Carry is shifted by one so that adding it to x gives the required sum
        y = carry << 1;
    }
    System.err.println("Addition : "+x);
}
```

### 2. Substraction

```
public void subtract(int x, int y)
{
    // Iterate till there is no carry
    while (y != 0)
    {
        // borrow contains common set bits of y and unset
        // bits of x
        int borrow = (~x) & y;

        // Subtraction of bits of x and y where at least
        // one of the bits is not set
        x = x ^ y;

        // Borrow is shifted by one so that subtracting it from
        // x gives the required sum
        y = borrow << 1;
    }
    System.err.println("Substraction is : "+y);
}
```

### 3. Division

```
public void div(int dvdnd, int dvsr)
```

```

{
    // initialize dividend and divisor
    int dividend = dvdnd;
    int divisor = dvsr;

    // initialize quotient
    int quotient = 0;

    //loop till the divisor does not become smaller than dividend
    while(dividend >= divisor)
    {
        dividend = dividend - divisor;
        quotient++;
    }

    // print results
    System.err.println("Quotient is "+quotient);

    // result of last subtraction
    System.err.println("Remainder is "+dividend);
}

```

#### 4. Multiplication

```

public void Mul(int x, int y)
{
    int c=0;
    for(int i=0;i<y;i++){
        c=c+x;
    }
    System.err.println("The Product is : "+c);
}

```

#### 5. Armstrong Number

```

public class Armstrong {
    public String checkNumber(int input_number)
    {
        int sum = 0, r, temp = input_number;
        while(input_number != 0)
        {
            r = input_number%10;
            input_number = input_number/10;
            sum = sum+(r*r*r);
        }
        if(temp == sum)
            return "Number is armstrong!";
        else
            return "Number not armstrong!";
    }
}

```

```
}  
}
```

## 6. EvenOdd

```
public class EvenOdd {  
    public void checkEvenOdd(int input_number)  
    {  
        if(input_number%2 == 0)  
            System.err.println("Number is even!");  
        else  
            System.err.println("Number is odd!");  
    }  
}
```

## 7. Factorial

```
public class Factorial {  
    public void printFactorial(int input_number)  
    {  
        System.err.print("Factorial of "+input_number+" is : ");  
        int f=1;  
        while(input_number > 0)  
        {  
            f=f*input_number;  
            input_number--;  
        }  
        System.err.println(f);  
    }  
}
```

## 8. Fibonacci

```
public class Fibonacci {  
    public void printFibonacci(int number_upto)  
    {  
        int n1=0,n2=1,n3,i,count=number_upto;  
        System.out.print(n1+" "+n2);//printing 0 and 1  
  
        for(i=2;i<count;i++)//loop starts from 2 because 0 and 1 are already printed  
        {  
            n3=n1+n2;  
            System.out.print(" "+n3);  
            n1=n2;  
            n2=n3;  
        }  
  
        System.out.println();  
    }  
}
```

```
}
```

## 9. Leap Year

```
public class LeapYear {
    public void checkYear(int input_year)
    {
        int year = input_year;
        boolean leap = false;

        if(year % 4 == 0)
        {
            if( year % 100 == 0)
            {
                if ( year % 400 == 0)
                    leap = true;
                else
                    leap = false;
            }
            else
                leap = true;
        }
        else
            leap = false;

        if(leap)
            System.err.println(year + " is a leap year!");
        else
            System.err.println(year + " is not a leap year!");
    }
}
```

## 10. Palindrome

```
public class Palindrome {
    public String checkPalindrome(int input_number)
    {
        int number = 0, remainder, temp = input_number;
        while (input_number!=0)
        {
            remainder = input_number%10;
            number = (number*10) + remainder;
            input_number= input_number/10;
        }
        if(temp == number)
            return "Number is palindrome!";
        else
            return "Number is not a palindrome!";
    }
}
```

```

        return "Number is not palindrome!";
    }
}

```

### 11. Prime Number

```

public class PrimeNumber {
    public void checkPrime(int input_number)
    {
        int i=1, c=0;

        while(i<=input_number)
        {
            if(input_number%i == 0)
                c++;
            i++;
        }

        if(c == 2)
            System.err.println("Number is prime!");
        else
            System.err.println("Number is not prime!");
    }
}

```

### 12. Print Star

```

public class PrintStar {
    int i=0;
    int j=0;
    public void print()
    {
        for (i=1;i<=4;i++)
        {
            for (j=1;j<=i;j++)
            {
                System.out.print("*");
            }
            System.out.println("");
        }
    }
}

```

### 13. Reversing Number

```

public class ReversingNumber {
    public int reverse(int input_number)
    {
        int number =0, remainder;
        while (input_number!=0)

```

```

    {
        remainder = input_number%10;
        number = number*10 + remainder;
        input_number= input_number/10;
    }
    return number;
}
}

```

## NUMBER CONVERSION

### 14. Binary to Decimal

```

public class BinaryToDec {
    public static void main(String args[])
    {
        int binnum, decnum=0, i=1, rem;
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Binary Number : ");
        binnum = scan.nextInt();

        // converting the number into decimal format
        while(binnum != 0)
        {
            rem = binnum%10;
            decnum = decnum + rem*i;
            i = i*2;
            binnum = binnum/10;
        }

        System.out.print("Equivalent Decimal is : ");
        System.out.println(decnum);
    }
}

```

### 15. Binary to Hex

```

public class BinaryToHex {
    public static void main(String args[])
    {
        int binnum, rem;
        String hexdecnum="";

        // digits in hexadecimal number system

        char hex[]={ '0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F'};
        Scanner scan = new Scanner(System.in);
    }
}

```

```

        System.out.print("Enter Binary Number : ");
        binnum = scan.nextInt();

        // converting the number in hexadecimal format
        while(binnum>0)
        {
            rem = binnum%16;
            hexdecnum = hex[rem] + hexdecnum;
            binnum = binnum/16;
        }

        System.out.print("Equivalent Hexadecimal Value of " +binnum+ " is :\n");
        System.out.print(hexdecnum);

    }
}

```

## 16. Binary to Octal

```

public class BinaryToOctal {
    public static void main(String args[])
    {
        int binnum, rem, quot, i=1, j;
        int octnum[] = new int[100];
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Binary Number : ");
        binnum = scan.nextInt();

        quot = binnum;

        while(quot != 0)
        {
            octnum[i++] = quot%8;
            quot = quot/8;
        }

        System.out.print("Equivalent Octal Value of " +binnum+ " is :\n");
        for(j=i-1; j>0; j--)
        {
            System.out.print(octnum[j]);
        }
    }
}

```

## 17. Decimal to Binary

```

public class DecToBinary {
    public DecToBinary()

```

```

{
    int decnum, rem, quot, i=1, j;
    int binnum[] = new int[100];
    Scanner scan = new Scanner(System.in);

    System.out.print("Enter any Decimal Number : ");
    decnum = scan.nextInt();

    quot = decnum;

    while(quot != 0)
    {
        binnum[i++] = quot%2;
        quot = quot/2;
    }

    System.out.print("Equivalent Binary Value of " + decnum + " is :\n");
    for(j=i-1; j>0; j--)
    {
        System.out.print(binnum[j]);
    }
}

public static void main(String[] args) {
    new DecToBinary();
}
}

```

## 18. Decimal to Hex

```

public class DecToHex {
    public static void main(String args[])
    {
        int decnum, rem;
        String hexdecnum="";

        /* digits in hexadecimal number system */

        char hex[]={ '0','1','2','3','4','5','6','7','8','9','A','B','C','D','E','F' };

        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Decimal Number : ");
        decnum = scan.nextInt();

        while(decnum>0)
        {
            rem = decnum%16;
            hexdecnum = hex[rem] + hexdecnum;

```



```

        decnum = decnum/16;
    }

    System.out.print("Equivalent Hexadecimal Value of " + decnum + " is :\n");
    System.out.print(hexdecnum);
}
}

```

### 19. Decimal to Octal

```

public class DecToOctal {
    public static void main(String args[])
    {
        int decnum, rem, quot, i=1, j;
        int octnum[] = new int[100];
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter any Decimal Number : ");
        decnum = scan.nextInt();

        quot = decnum;

        while(quot != 0)
        {
            octnum[i++] = quot%8;
            quot = quot/8;
        }

        System.out.print("Equivalent Octal Value of " + decnum + " is :\n");
        for(j=i-1; j>0; j--)
        {
            System.out.print(octnum[j]);
        }
    }
}

```

### 20. Hexadecimal to Binary

```

public class HexToBinary {
    public static int hex2decimal(String s)
    {
        String digits = "0123456789ABCDEF";
        s = s.toUpperCase();
        int val = 0;
        for (int i = 0; i < s.length(); i++)
        {
            char c = s.charAt(i);
            int d = digits.indexOf(c);
            val = 16*val + d;
        }
    }
}

```

```

    }
    return val;
}
public static void main(String args[])
{
    String hexdecnum;
    int decnum, i=1, j;
    int binnum[] = new int[100];
    Scanner scan = new Scanner(System.in);

    System.out.print("Enter Hexadecimal Number : ");
    hexdecnum = scan.nextLine();

    /* first convert the hexadecimal to decimal */
    decnum = hex2decimal(hexdecnum);

    /* now convert the decimal to binary */
    while(decnum != 0)
    {
        binnum[i++] = decnum%2;
        decnum = decnum/2;
    }

    System.out.print("Equivalent Binary Number is : ");
    for(j=i-1; j>0; j--)
    {
        System.out.print(binnum[j]);
    }
    System.out.println();
}
}

```

## 21. Hexadecimal to Decimal

```

public class HexToDecimal {
    public static int hex2decimal(String s)
    {
        String digits = "0123456789ABCDEF";
        s = s.toUpperCase();
        int val = 0;
        for (int i = 0; i < s.length(); i++)
        {
            char c = s.charAt(i);
            int d = digits.indexOf(c);
            val = 16*val + d;
        }
        return val;
    }
}

```

```

public static void main(String args[])
{
    String hexdecnum;
    int decnum;
    Scanner scan = new Scanner(System.in);

    System.out.print("Enter Hexadecimal Number : ");
    hexdecnum = scan.nextLine();

    decnum = hex2decimal(hexdecnum);

    System.out.print("Equivalent Decimal Number is " + decnum);
}
}

```

## 22. Hexadecimal to Octal

```

public class HexToOctal {
    public static int hex2decimal(String s)
    {
        String digits = "0123456789ABCDEF";
        s = s.toUpperCase();
        int val = 0;
        for (int i = 0; i < s.length(); i++)
        {
            char c = s.charAt(i);
            int d = digits.indexOf(c);
            val = 16*val + d;
        }
        return val;
    }
    public static void main(String args[])
    {
        String hexdecnum;
        int decnum, i=1, j;
        int octnum[] = new int[100];
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Hexadecimal Number : ");
        hexdecnum = scan.nextLine();

        // first convert hexadecimal to decimal

        decnum = hex2decimal(hexdecnum);

        // now convert decimal to octal

        while(decnum != 0)

```

```

    {
        octnum[i++] = decnum%8;
        decnum = decnum/8;
    }

    System.out.print("Equivalent Octal Number is :\n");
    for(j=i-1; j>0; j--)
    {
        System.out.print(octnum[j]);
    }
}
}

```

### 23. Octal to Binary

```

public class OctalToBinary {
    public static void main(String args[])
    {
        int octnum, rem, quot, i=1, j;
        int binnum[] = new int[100];
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Octal Number : ");
        octnum = scan.nextInt();

        quot = octnum;

        while(quot != 0)
        {
            binnum[i++] = quot%2;
            quot = quot/2;
        }

        System.out.print("Equivalent Binary Value of " +octnum+ " is :\n");
        for(j=i-1; j>0; j--)
        {
            System.out.print(binnum[j]);
        }
    }
}

```

### 24. Octal to Decimal

```

public class OctalToDec {
    public static void main(String args[])
    {
        int octnum, decnum=0, i=0, orig;
        Scanner scan = new Scanner(System.in);
    }
}

```

```

        System.out.print("Enter Octal Number : ");
        octnum = scan.nextInt();

        orig = octnum;

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

        System.out.print("Equivalent Decimal Value of " + orig + " is :\n");
        System.out.print(decnum);
    }
}

```

## 25. Octal to Hex

```

public class OctalToHex {
    public static void main(String args[])
    {
        String octnum, hexnum;
        int decnum;
        Scanner scan = new Scanner(System.in);

        System.out.print("Enter Octal Number : ");
        octnum = scan.nextLine();

        decnum = Integer.parseInt(octnum, 8);
        hexnum = Integer.toHexString(decnum);

        System.out.print("Equivalent Hexadecimal Value of " + octnum + " is :\n");
        System.out.print(hexnum);
    }
}

```

## 26. Command Line Arguments

```

#include<stdio.h>

int main(int argc,char* argv[])
{
    int counter;
    printf("Program Name Is: %s",argv[0]);
    if(argc==1)
        printf("\nNo Extra Command Line Argument Passed Other Than Program Name");
    if(argc>=2)
    {

```

```

    printf("\nNumber Of Arguments Passed: %d",argc);
    printf("\n----Following Are The Command Line Arguments Passed----");
    for(counter=0;counter<argc;counter++)
        printf("\nargv[%d]: %s",counter,argv[counter]);
}
return 0;
}

```

### **/\*\* Output \*\*/**

#### **1. Without Argument**

```

$ ./a.out
Program Name Is: ./a.out
No Extra Command Line Argument Passed Other Than Program Name
*****

```

#### **2. Single Argument in double quotes**

```

$ ./a.out "First Second Third"
Program Name Is: ./a.out
Number Of Arguments Passed: 2
----Following Are The Command Line Arguments Passed----
argv[0]: ./a.out
argv[1]: First Second Third
*****

```

#### **3. Single Argument in single quotes**

```

$ ./a.out 'First Second Third'
Program Name Is: ./a.out
Number Of Arguments Passed: 2
----Following Are The Command Line Arguments Passed----
argv[0]: ./a.out
argv[1]: First Second Third
*****

```

#### **4. Three Arguments**

```

$ ./a.out First Second Third
Program Name Is: ./a.out
Number Of Arguments Passed: 4
----Following Are The Command Line Arguments Passed----
argv[0]: ./a.out
argv[1]: First
argv[2]: Second
argv[3]: Third
*****

```