**Assignment – 4**

**(Bitwise Operators, if-else)**

**Q1. Define two numbers v and n, where v is the original number and n is the**

**shifting value. Then shift the value of v to left (<<) and right (>>) up to n bits**

**and print the new values. Also use the >>> operator for right shift and**

**observe the difference between >> and >>>.**

import java.util.\*;

class A4Q1

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.print("Enter n: ");

int n = sc.nextInt();

System.out.print("Enter v: ");

int v = sc.nextInt();

int ls= v << n;

int rs= v >> n;

//int lls= v <<< n;

int rrs= v >>> n;

System.out.println(v+" << "+n+" = "+ls);

System.out.println(v+" >> "+n+" = "+rs);

//System.out.println(v+" <<< "+n+" = "+lls);

System.out.println(v+" >>> "+n+" = "+rrs);

}

}

**OUTPUT**

**To Compile : javac A4Q1.java**

**To Run : java A4Q1**

**Output : Enter n: 12**

**Enter v: 13**

**13 << 12 = 53248**

**13 >> 12 = 0**

**13 >>> 12 = 0**

Q2. Define two numbers and swap them without using third variable.

a. Use the bitwise ^ operator and show the numbers after swapping.

b. Restore the numbers by using (+, -) operator and show the numbers.

**CODE**

import java.util.\*;

class A4Q2

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.print("Enter number: ");

int a = sc.nextInt();

System.out.print("Enter number: ");

int b = sc.nextInt();

a=a^b;

b=a^b;

a=a^b;

System.out.println("After swapinging");

System.out.println(a);

System.out.println(b);

a=a+b;

b=a-b;

a=a-b;

System.out.println("After recovering");

System.out.println(a);

System.out.println(b);

}

}

**OUTPUT**

**To Compile : javac A4Q2.java**

**To Run : java A4Q2**

**Output : Enter number: 13**

**Enter number: 12**

**After swapinging**

**12**

**13**

**After recovering**

**13**

**12**

**Q3. WAP in JAVA to input an amount in Rs through command line argument**

**and find the minimum number of 2000, 500, 200, 100, 50, 20, 10, 5, 2 and**

**1 Rs denominations will be needed to have that amount.**

**Ex: Rs. 3868 => (2000\*1) + (500\*3) + (200\*1) + (100\*1) + (50\*1) + (10\*1) +**

**(5\*1) + (2\*1) + (1\*1)**

**CODE**

import java.util.\*;

class A4Q3

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.print("Enter number: ");

int num = sc.nextInt();

int n =num;

if(n/2000>0)

{

System.out.println("2000 = "+(n/2000));

n=n%2000;

}

if(n/500>0)

{

System.out.println("500 = "+(n/500));

n=n%500;

}

if(n/200>0)

{

System.out.println("200 = "+(n/200));

n=n%200;

}

if(n/100>0)

{

System.out.println("100 = "+(n/100));

n=n%100;

}

if(n/50>0)

{

System.out.println("50 = "+(n/50));

n=n%50;

}

if(n/20>0)

{

System.out.println("20 = "+(n/20));

n=n%20;

}

if(n/10>0)

{

System.out.println("10 = "+(n/10));

n=n%10;

}

if(n/5>0)

{

System.out.println("5 = "+(n/5));

n=n%5;

}

if(n/2>0)

{

System.out.println("2 = "+(n/2));

n=n%2;

}

if(n/1>0)

{

System.out.println("1 = "+(n/1));

n=n%1;

}

}}

**OUTPUT**

**To Compile : javac A4Q3.java**

**To Run : java A4Q3**

**Output : Enter number: 15**

**10 = 1 5 = 1**

**Q4. Test the nature of the root of a quadratic equation ax2 +bx+c=0. The nature**

**can be tested from the discriminant d=b2 -4ac. The result can be displayed**

**from the Table-2 after finding d from the values given in Table-1.**

**CODE**

import java.util.\*;

class A4Q4

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.print("Enter a: ");

int a = sc.nextInt();

System.out.print("Enter b: ");

int b = sc.nextInt();

System.out.print("Enter c: ");

int c = sc.nextInt();

int d = b\*b-(4\*a\*c);

if(d>0)

{

System.out.print("Rational and squared roots");

//System.out.print("Real and equal roots");

}

else if(d<0)

{

System.out.print("Roots are imaginary");

}

else

{

System.out.print("Roots are equal so only one root");

}

}}

**OUTPUT**

**To Compile : javac A4Q4.java**

**To Run : java A4Q4**

**Output :** **Enter a: 14**

**Enter b: 25**

**Enter c: 23**

**Roots are imaginary**

**Q5. Input 3 sides of a triangle and find out which type of triangle is this.**

**CODE**

import java.util.\*;

class A4Q5

{

public static void main(String args[])

{

Scanner sc = new Scanner(System.in);

System.out.print("Enter side a: ");

int a = sc.nextInt();

System.out.print("Enter side b: ");

int b = sc.nextInt();

System.out.print("Enter side c: ");

int c = sc.nextInt();

if(a>0&&b>0&&c>0)

{

if(a==b && b==c)

{

System.out.print("Equialteral triangle");

}

else if(a==b || b==c || c==a)

{

System.out.print("Isoceles triangle");

}

else if((a\*a==(b\*b + c\*c)) || (b\*b==(a\*a + c\*c)) || (c\*c==(b\*b + a\*a)))

{

System.out.print("Right angled triangle");

}

else

{

System.out.print("Scalene triangle");

}

}

}

}

**OUTPUT**

**To Compile : javac A4Q5.java**

**To Run : java A4Q5**

**Output : Enter side a: 12**

**Enter side b: 13**

**Enter side c: 14**

**Scalene triangle**