**Java - Introduction to Programming**

**Lecture 14**

**Bit Manipulation**

**Get Bit**

**import java.util.\*;**

**public class Bits {**

**public static void main(String args[]) {**

**int n = 5; //0101**

**int pos = 3;**

**int bitMask = 1<<pos;**

**if((bitMask & n) == 0) {**

**System.out.println("bit was zero");**

**} else {**

**System.out.println("bit was one");**

**}**

**}**

**}**

**Set Bit**

**import java.util.\*;**

**public class Bits {**

**public static void main(String args[]) {**

**int n = 5; //0101**

**int pos = 1;**

**int bitMask = 1<<pos;**

**int newNumber = bitMask | n;**

**System.out.println(newNumber);**

**}**

**}**

**Clear Bit**

**import java.util.\*;**

**public class Bits {**

**public static void main(String args[]) {**

**int n = 5; //0101**

**int pos = 2;**

**int bitMask = 1<<pos;**

**int newBitMask = ~(bitMask);**

**int newNumber = newBitMask & n;**

**System.out.println(newNumber);**

**}**

**}**

**Update Bit**

import java.util.\*;

public class Bits {

public static void main(String args[]) {

Scanner sc = new Scanner(System.in);

int oper = sc.nextInt();

// oper=1 -> set; oper=0 -> clear

int n = 5;

int pos = 1;

int bitMask = 1<<pos;

if(oper == 1) {

//set

int newNumber = bitMask | n;

System.out.println(newNumber);

} else {

//clear

int newBitMask = ~(bitMask);

int newNumber = newBitMask & n;

System.out.println(newNumber);

}

}

}

**Homework Problems**

1. Write a program to find if a number is a power of 2 or not.
2. Write a program to toggle a bit a position = “pos” in a number “n”.
3. Write a program to count the number of 1’s in a binary representation of the number.
4. Write 2 functions => decimalToBinary() & binaryToDecimal() to convert a number from one number system to another. [BONUS]