**Computer Science AP**

**Bin2Dec\_Dec2Bin**

Write a program that converts a number from decimal (base 10) to binary (base 2) or from binary to decimal. Prompt the user for the type of conversion; either “decimal to binary” or “binary to decimal”.

Include a loop that prompts the user “Do you wish to continue?”, so that the user can run the program more than once.

Include error checking on user’s input. For example, if user selects binary to decimal, the binary number should contain only 1’s and 0’s. Likewise, if the user selects decimal to binary, the decimal number should contain only digits. Allow user to re-enter data.

HINT: Character.isDigit (str.charAt(n)) will return true if the char at location n is a digit.

Consider using the following algorithms:

**Binary to Decimal:**

Parse through the input string using length() as the limit of a loop. Use equals() to determine whether the current character is a “0” or a “1” . Continually add powers of 2 for each binary digit “1”.

**Decimal to Binary:**

HINT: Since the user’s input should is in String, the following statement can be used to convert a String to an int.

int y = Integer.parseInt(str);

**Method 1:** Continually divide by 2 and record ALL the remainders, until the dividend is zero. Concatenate all the remainders; the first remainder is the rightmost digit and the last remainder is the leftmost digit.

OR

**Method 2:** Use a loop to find the largest power of 2 that can be subtracted from userInput.

Test whether each power of 2 that is less than Math.pow(2,powOf2) can be subtracted from userInput. If it can, print out a “1”, otherwise print out a “0”.

Here is a sample outline of the class.

import java.util.Scanner;

public class bin2Dec\_dec2Bin {

public static void main (String [] args) {

Scanner input = new Scanner (System.in);

String str=””;

do {

System.out.println (“Enter 1: Binary To Decimal\n” +

“Enter 2: Decimal to Binary\n”);

str = input.next();

} while (!str.equals(“1”) && !str.equals(“2”) );

if (str.equals(“1”)) {

//get users decimal number

//call bin2Dec

else

//get users binary number

//call dec2Bin

}

}

private static int bin2Dec(String s) {

}

private static String dec2Bin(String s) {

}

}