**ASSIGNMENT 1**

**Q.1 Print count using Recursion take the user input.**

import java.util.Scanner;

public class CountOfDigits {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("ENTER THE NUMBER ");

int num = sc.nextInt();

int sol = count(num);

System.out.println("USING RECURSION");

System.out.println(sol);

System.out.println("USING FOR LOOP");

System.out.println(count1(num));

}

public static int count(int n) {

if(n==0)

return 0;

else

return 1 + count(n/10);

}

//using FOR loop

public static int count1(int n){

int count = 0;

for(int i = n ; i>0 ; i = i/10) {

count = count + 1;

}

return count;

}

}

**Q.2 Find the power of 2 using Recursion. Also take the input from the user.**

import java.util.Scanner;

public class PowOf2 {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("ENTER THE NUMBER");

int num = sc.nextInt();

System.out.println("USING RECURSION");

int ans1 = pow(num);

System.out.println(ans1);

System.out.println("USING FOR LOOP");

int ans2 = pow1(num);

System.out.println(ans2);

}

//USING RECURSION

public static int pow(int n) {

if(n == 0) {

return 1;

} else {

return 2\*pow(n-1);

}

}

//USING FOR LOOP

public static int pow1(int n) {

int temp = 1;

for(int i = 0; i < n; i++) {

temp = temp \* 2;

} return temp;

}

}

**Q3 Take the input from the user and find the term of the fibonacci series using recursion and for loop.**

import java.util.Scanner;

public class FibonacciSeries {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("ENTER THE NUMBER");

int n = sc.nextInt();

System.out.println("USING FOR LOOP");

int ans1 = fib1(n);

System.out.println(ans1);

System.out.println("USING RECURSION");

int ans2 = fib2(n);

System.out.println(ans2);

}

//USING FOR LOOP

public static int fib1(int n) {

int arr[] = new int[n];

arr[0] = 0;

arr[1] = 1;

int i;

for (i = 2; i < n; i++) {

arr[i] = arr[i - 1] + arr[i - 2];

} return arr[n - 1];

}

//USING RECURSION

public static int fib2(int n) {

if (n == 1)

return 0;

if (n == 2)

return 1;

else

return fib2(n - 1) + fib2(n - 2);

}

}

**Q.4 Find the sum of the numbers using recursion and for loop.**

import java.util.Scanner;

public class SumOfDigits {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

System.out.println("ENTER THE NUMBER");

int num = sc.nextInt();

System.out.println("USING FOR LOOP");

int ans1 = sum1(num);

System.out.println(ans1);

System.out.println("USING RECURSION");

int ans2 = sum2(num);

System.out.println(ans2);

}

//USING FOR LOOP

public static int sum1(int n) {

int sum = 0;

for(int i = n; i > 0; i = i/10) {

sum = sum + i%10;

}

return sum;

}

//USING RECURSION

public static int sum2(int n) {

if(n == 0)

return 0;

else

return n%10 + sum2(n/10);

}

}