Assignment 1

Recursion Question

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

Sol :

Code - >

```
import java.util.*;
public class Count {
    public static int count(int n){
        if(n<10){
            return 1;
        }
        int rec = count(n/10);
        return 1+rec;
    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number : ");
            int n = sc.nextInt();
            int ans = count(n);

            System.out.println("Count of digits are : " + ans);
    }
}
```

Output ->

Enter the number : 6758

Count of digits are : 4

Process finished with exit code 0

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

Sol :

Code - >

```
import java.util.Scanner;

public class PowerOf2 {
    public static int powerOfTwo(int n){
        if(n == 0){
            return 1;
        }

        if(n == 1){
            return 2;
        }
        return 2*powerOfTwo(n-1);
    }

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        System.out.print("Enter Power of two : ");
        int n = sc.nextInt();
        int ans = powerOfTwo(n);
        System.out.println("Calculated power is : " + ans);
    }

}
```

Output ->

Enter Power of two : 6

Calculated power is : 64

Process finished with exit code 0

Q.3 : Take the input from the user and find the term of the fibonacci series using recursion and for loop.

Sol :

Code - >

```
import java.util.Scanner;

public class FibonacciTerm {
    public static int fibonacciTermRec(int n){
        if(n <= 1){
            return n;
        }
        int rec = fibonacciTermRec(n-1)+fibonacciTermRec(n-2);
        return rec;

    }
    public static int fibonacciTermLoop(int n){
        if(n == 0){
            return 0;
        }
        int a = 0;
        int b = 1;
        int next = a+b;
        for(int i=2; i<=n; i++){
            next = a+b;
            a = b;
            b = next;
        }
        return next;

    }

    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number : ");
        int n = sc.nextInt();
        int ansRec = fibonacciTermRec(n);
        System.out.println("Fibonacci Term using recurssion : " + ansRec);
        int ansLoop = fibonacciTermLoop(n);
        System.out.println("Fibonacci Term using for loop : " + ansLoop);
    }
}
```

Output ->

Enter the number : 9

Fibonacci Term using recurssion : 34

Fibonacci Term using for loop : 34

Process finished with exit code 0

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

Sol :

Code - >

```
import java.util.Scanner;

public class SumOfNumber {
    public static int sumUsingRec(int n){
        if(n==0){
            return 0;
        }
        return n+sumUsingRec(n-1);
    }
    public static int sumUsingLoop(int n){
        int sum = 0;
        for (int i=1; i<=n; i++){
            sum += i;
        }
        return sum;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the number : ");
        int n = sc.nextInt();
        int ansRec = sumUsingRec(n);
        System.out.println("Sum using recurssion : " + ansRec);
        int ansLoop = sumUsingLoop(n);
        System.out.println("Sum using for loop : " + ansLoop);
    }
}
```

Output ->

Enter the number : 10

Sum using recurssion : 55

Sum using for loop : 55

Process finished with exit code 0