```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package ds_recursion_assignment;

/**
 *
 * @author ogm2
 */
public class DS_Recursion_Assignment {

   public DS_Recursion_Assignment() {
   }

   public int sumOfDigits(long n)// use modulo

   {

//       long m=n;//to determine the number of digits
//       if (n<0)
//          m=(n*-1);
//       int l=(int)Math.log10(m)+1;
//       System.out.println (l);

       int total=0;

       total+=n%10;
       n=n/10;

       if(n==0)
          return total;
       else
          return sumOfDigits(n)+ total;



   }

   public int recur(int n) {

       long m=n;//to determine the number of digits
       if (n<0)
          m=(n*-1);
       int l=0;
```

```
    for(; m>0; l++)
        m=m/10;
    if (n < 0)
        l=-1;

    return l;

}

public int recur2(int n) {
    long m=n;//to determine the number of digits
    if (n<0)
        m=(n*-1);
    int sum=0;

    if (n < 0) {
        return -1;
    }
    else if (n < 10) {
        return 1;
    }
    else{
        while(m>0){
            sum+=(m%10);
            m=m/10;
        }
        return sum;



    }

}

public int iterativeCollatz(int n) {
    int count = 1;
    while (n > 2){
        if (n % 2 == 0) {
            n = n / 2;
        } else {
            n = 3 * n +1;
        }
        count ++;
    }
    return count;
}
```

```
    /**
     * @param args the command line arguments
     */
    public static void main(String[] args) {
        DS_Recursion_Assignment dsra = new DS_Recursion_Assignment();
        System.out.println("SUM OF DIGITS");
        System.out.println("-12 => " + dsra.sumOfDigits(-12));
        System.out.println("1234 => " + dsra.sumOfDigits(1234));
        System.out.println("2514 => " + dsra.sumOfDigits(2514));
        System.out.println("88888888 => " + dsra.sumOfDigits(88888888));
        System.out.println("\n\nRECUR");
        System.out.println("-12 => " + dsra.recur(-12));
        System.out.println("1234 => " + dsra.recur(1234));
        System.out.println("2514 => " + dsra.recur(2514));
        System.out.println("88888888 => " + dsra.recur(88888888));
        System.out.println("\n\nRECUR2");
        System.out.println("-12 => " + dsra.recur2(-12));
        System.out.println("1234 => " + dsra.recur2(1234));
        System.out.println("2514 => " + dsra.recur2(2514));
        System.out.println("88888888 => " + dsra.recur2(88888888));
        System.out.println("4 => " + dsra.recur(4));
        System.out.println("\n\nCOLLATZ");
        System.out.println("You're all alone on this one ^^");
    }

}
```