My Solution on Assignment 2 - Problem 6

This is my Solution of Assignment 2 - Problem 6 from the Computer Science Course CS106A of Prof. Mehran Sahami at the STANFORD University.

Hailstone.java

```
/*
 * File: Hailstone.java
 * Name: Axel Werner
 * Section Leader:
 * --------------------
 * This file is the starter file for the Hailstone problem.
 */

import acm.program.*;

/**
 * Class to ask User for a integer start number to
 * calculate Hailstone Numbers sequence.
 * @author Axel Werner
 */
public class Hailstone extends ConsoleProgram {

    /**
     * Main Program
     */
    public void run() {
        println("Hailstone Calculator");
        println("====================================\n\n");

        int input = askForNumber();

        println("Calculating Hailstone Numbers now:\n");

        int tmp = doCalculations(input);

        println("Last Hailstone Number ('" + tmp + "') reached.");
        println("I needed '" + stepsCounter + "' Steps to reach this
point.\n\n");
        println("Im done. == TERMINATED ==");
    }

    /**
     * Method to calculate the Hailstone Numbers.
     * It takes a single positive integer number, calculates and prints
out
     * the Hailstone Row and then returns the last Number (1).
     *
```

```
     * @param input any positive integer number
     * @return Always returns 1, as is always the last Hailstone Number
in a Calculation. Why that?
     *             Just for readability.
     */
    private int doCalculations(int input) {
        int tmp = input;
        while(tmp!=1){
            stepsCounter++; // increment the Step Counter.
            if( isEven(tmp) ){
                int oldTmp=tmp;
                tmp=tmp/2;
                println( oldTmp + " is even. So i take 1/2: " + tmp );
            }else{ // so must be Odd then...
                int oldTmp=tmp;
                tmp=tmp*3+1;
                println( oldTmp + " is odd. So i make 3n+1: " + tmp );
            }
        }
        return tmp;
    }

    /**
     * Method asks User for a positive integer Number and
     * then return it.
     *
     * @return positive integer Number given by User Input.
     */
    private int askForNumber() {
        int input = readInt("Pick a positive integer Number: ");
        while(input<=0){
                println("ERROR: You need to pick a POSITIVE INTEGER.
Please retry.\n");
                input = readInt("Pick a positive integer Number: ");
        }
        println("Thanks!\n");
        return input;
    }

    /**
     * Method takes an integer number to test if its even.
     * It returns TRUE if Number is even.
     * Else it returns FALSE.
     *
     * @param tmp integer number to test
     * @return TRUE if parameter is an even Number. Else returns FALSE.
     */
    private boolean isEven(int tmp) {
        if(tmp%2!=0){
            return false; // there is a remainder. So it must be ODD.
```

```
        }else{
            return true; // there is NO remainder. So it must be EVEN.
        }
    }

    /**
     * Instance Var to keep track of the Number of Steps needed to
reach 1
     */
    private int stepsCounter=0;
}
```

— *Axel Werner* *2012-04-02 20:30*

java, karel, stanford, university, cs106, computer, science, learning, programming