D-BAUG Informatik I

Exercise session: week 6

HS 2018

Homework

- Questions?

Task 1: Repeating Input

The following method repeats the input of the user (terminated by "end"):

```java
public static void repeatInput() {
  while(true) {
    String input = In.readLine();
    if (input.equals("end")) {
        return;
    }
    Out.println(input);
  }
}
```

```
> hello
hello
> you
you
> end
```

- Rewrite the method in a recursive way

Task 2: Reversing the Input

- Modify the recursive method such that it outputs all inputs after "end" was entered *in a reverse fashion*

```
> hello
> you
> end
you
hello
```

Iterative Power

The following method `poweri` returns the n-th positive power x^n of a number $x \in \mathbb{R}$ for $n > 0$:

```java
// pre: n > 0
// post: return x^n
public static double poweri(double x, int n){
    double result = 1;
    while (n > 0){
        result *= x;
        --n;
    }
    return result;
}
```

Task 3: Recursive Power

- Implement *a recursive* method `powerr` to return the n-th positive power of a number $x \in \mathbb{R}$ for $n > 0$.

  You may not use any loops (no `while`, no `for`, no `do-while`).

Task 4: Recursive Power Optimized

- Implement a recursive method `powers` to return the n-th positive power of a number $x \in \mathbb{R}$ for $n > 0$ *using a small number of multiplications*.

  Again, you may not use any loops (no `while`, no `for`, no `do-while`).

- Optional: improve the methods such that they can additionally deal with negative powers.