



Informatik I

Exercise session 7

Autumn 2019

Homework

- Questions?

Task 1: Repeating Input

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

```
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 $n > 0$:

```
// 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 **power** 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.