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Tutorial exercises
Objektorientierte Programmierung: Wintersemester 2021/2022
Nr. 3

Task 3.1: 404 Title not found

Look at the following method that computes the power of two given numbers in Java:

```
1  double pow(double x, int n){
2    if(n == 0){
3      return x;
4    }
5    return pow(x, n) * x;
6  }
```

There are two mistakes within the implementation. Find those mistakes and fix them.

Task 3.2: Stay a WHILE and listen

Look at the following method in Java:

```
1  double geometrics(int n, double x){
2    double result = 0;
3    while(true){
4      result+=pow(x,n);
5      if(n==0){
6        return result;
7      }
8      n--;
9    }
10 }
```

Rewrite *geometrics* so that it doesn't contain *if* anymore but still returns the same result.

Task 3.3: Harmonic Convergence: Raava vs Vaatu

Look at the following method that computes the result of the harmonic sequence for a given n: $(\sum_{k=1}^{n} \frac{1}{k})$

```
1  double harmonics(int n) {
2    double result = 1.0;
3    while(n>1){
4      result+=1.0/n;
5      n--;
6    }
7    return result;
8  }
```

Rewrite the method *harmonics* in such a way that it doesn't compute the result **iteratively** using a *while*-loop but computes the result **recursively**.