Java Kurs

Übungs- und Fragestunde

Christoph Baitis

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Overview

String Grundlagen *

Schreibe ein Java-Program, welches

- Den Name des Nutzers von der Komandozeile einliest
- Das Alter des Benutzers einliest
- Ausgibt "Hallo [Name], du bist [alter] Jahre als."

String If-Then-Else *

Aufgabe If-Then-Else*

Erweitere das Program aus Aufgabe 1 so, dass ausgegeben wird, welches Fahrzeug der Nutzer fahren dürfte. Dabei gilt:

- Bobby-Car darf man ab 2 Jahre Fahren
- Fahrrad darf man ab 5 Jahren Fahren
- Mopeds darf man ab 16 Jahren fahren
- Auto darf man mit 17 Jahren nur begleitet fahren
- Ab 18 Jahren darf man Auto ohne Einschränkungen fahren

Funktionen **

Aufgabe Funktionen **

Write a program which calculates the factorial of a given number. The factorial of a number n, denoted by n!, is the product of all integers from n to 1. For example, 5! = 5 x 4 x 3 x 2 x 1 = 120. By convention, the value of 0! is 1.

Create a class named Functions and save it to Functions.java. The class must contain a static method factorial(...), which calculates the factorial of n:

```java
public class Functions {
    public static int factorial(int n) {
        // TODO: insert your implementation here
    }
}
```

Optionally, add a main method to the Functions class to try your implementation:

```java
public static void main(String[] args) {
    System.out.println("The factorial of 5 is:");
    System.out.println(factorial(5));
}
```

It should print

```
The factorial of 5 is:
120
```

to the console.

String Verarbeitung **

Aufgabe String Verarbeitung **
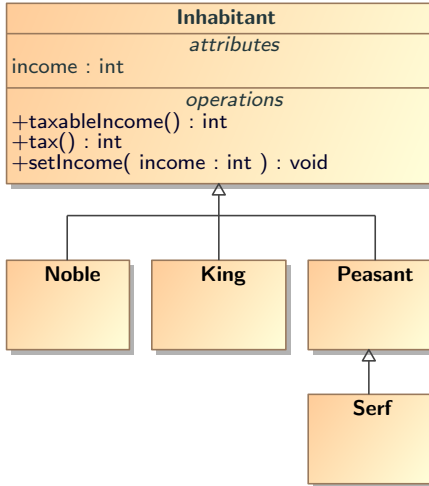
Aufgabe zu Strings und String-Arrays. Siehe Leet.pdf

Klassen- und Objekte **(*)

Aufgabe zu Klassen und Objekten. Siehe classes-and-objects.pdf

Vererbung ***

Aufgabe Vererbung ***

Finance and taxation in a middle age kingdom are going to be computerized. The different population groups are modeled by the following class hierarchy:

The attribute income is used for the respective inhabitant's actual annual income in Taler. The methods taxableIncome() and tax() should provide the correct values for each of the kingdom's inhabitants according to the following royal instructions:

- As long as this law does not state something else, every inhabitant has to pay taxes for his whole annual income.
- Every inhabitant has to pay 10% of his taxable income as taxes. The tax value is rounded down to an integer with 1 Taler being the absolute minimum.
- The king does not pay any taxes at all.
- Members of the nobility pay at least 20 Taler taxes.
- 12 Taler of a serf's income are tax-free.

The tax calculation rules are expected to change annually. Because of that, royal instruction number 2 should be implemented at only one point of the class hierarchy. That way, adjusting the code to new rules is much easier.

Implement the class hierarchy! At first, think about how to implement the methods of the Inhabitant class. Which methods should be overridden by subclasses? How should the above class diagram be completed?