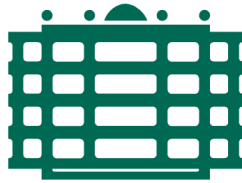# Software Engineering and Programming Basics - WS2021/22 Assignment 1

TECHNISCHE UNIVERSITÄT CHEMNITZ

Professorship of Software Engineering

10| 2021

Organisational

Deadline

07.11.2021 - 23:59

Submission

To submit your answers, please use the test item titled 'Submission' in the menu of Assignment 1. Click on 'Start Test'. You can pause the test and have your answers be saved temporarily. Click on 'Finish Test' to submit your answers. You have two tries. The latest try will be the one that is graded.
You also need to adhere to the General Assignment Instructions.

Questions

Since this is a PVL, it is important that all students are able to access all necessary information. Therefore, if you have any questions, please ask them in the in the course forum in the thread
'Assignment 1: Questions'.

Part I

In this part, you receive a description of a method and need to create the correct method head.
The names of the methods will be indicated by being written in **bold font**, while parameter names will be written in *italic font*. You will need to figure out the necessary data types by yourself. Note that the order of the parameters matter, so always follow the order they are introduced in the text.
This task is just as much about reading comprehension as it is about programming, so be careful and precise when giving your answers.

Example

This is an example of a method description and the format you should give your answer in.

Description:
This method is called **getWeekday**. It is a public and static method that determines what day of the week it is. To do this, it receives the current number of the *day* in the month, the current number of the *month* in the year, and the current *year*. It returns the name of the day.

Answer:

```
public static String getWeekday(int day, int month, int year)
```

Tasks

1. This method's purpose is to count sheep, hence it is named **countSheep**. To do this, it receives the amount of *legs* present on the meadow, parts them by four and returns the amount of sheep. (It can be assumed that only sheep with a complete set of exactly four legs are present.)
   The method is a public and static method.

2. This method's purpose is to determine the ratio of fur colours within the herd, thus its name is **furColourRatio**. To do this, it receives the amount of sheep with *black* fur and the amount of sheep with *white* fur as parameters. Use the colours as variable names.

If there are more sheep with black fur, the method returns 1. If there are more sheep with white fur, the method returns -1. If the amount is the same, it returns 0.
The method is a public and static method.

3. This method's purpose is to determine, whether the shepherd has enough hay to feed all sheep today. Its name is **canFeed**. To do this, the method receives the amount of *sheep* and the amount of *hay* in kilogram. Each sheep eats 2.5 kilogram hay per day.
The method is a public and static method.

4. This method's purpose is to calculate what the shepherd would earn if they sold all sheep right now. Its name is **calculateSales**. The method receives the amount of *sheep* and the current *value* of one sheep and returns the calculated sales.
The method is a public and static method.

Part II

In this part, you will need to write complete methods. You can add your code directly into the coding window of the Onyx test. Please do not change or remove anything from the code that is already displayed.
If you want to have a different main method in order to test your code, you can write your code in an IDE of your choice first and simply copy the necessary parts into this window later. You do not need to copy your main method.
You are allowed to divide your answer into more than one method.

Task 1

Task description:
The shepherd may choose to sell parts of their herd. Because of this, they want to know how many different possibilities they have to divide their herd.

Your task is to write a method called **herdDivisors**. The method receives the amount of *sheep* that are currently in the herd. It returns the amount of numbers that the herd can be evenly divided by.

```
Example:
Input: 6
Output: 4
The reason is that 6 has 4 divisors: 1, 2, 3 and 6
```

Notes:

- You need to avoid a 'division by zero' error!

- You can assume that there will be not negative numbers as input.

Task 2

Task description:
To organize the herd, every sheep has a unique ID. The shepherd applies a system based on fur colour when assigning these IDs. There are four different kinds of sheep: White sheep, black sheep, brown sheep and 'lucky' sheep with several fur colours.

- Black sheep receive an ID that is divisible by 3.

- Brown sheep receive an ID that is divisible by 5.

- Lucky sheep receive a prime number as ID.

- White sheep can receive any other kind of number as ID.

Your task is to write a method **getColourByID**, which receives the *ID* of a sheep and returns a String with the sheep's fur colour.

```
Examples:

Input: 3
Output: "black"

Input: 4
Output: "white"

Input: 17
Output: "lucky"
```

Notes:

- If a number is divisible by 3 and 5, go with the smaller number, ergo the sheep will be black.

- You can assume that all inputs will be > 0.