Technische Hochschule Ingolstadt, WI
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Software Development (Winter 25/26)

Assignment 01

Bonus points can be claimed until 20th October 2025, 09:25 AM

Exercise 1 ***(Geometric formulars, 1 Points)***

a) Suppose we are given a rectangle with a length of 4 m and a width of 3 m. Calculate the area of this rectangle in Python in the most naive way possible.

b) Use variables with meaningful names to make your calculation more understandable.

c) Think of the rectangle as a property you want to buy. The city council has set the price per sqm to 50€. On those purchases a tax of 3,5% has to be paid. Calculate the net and gross price you would have to pay and inform the user about the composition of the gross price.

Exercise 2 ***(Dog years, 2 Points)***

Children and dog lovers often ask themselves how old their dog would be if it were not a dog but a human being. Commonly, dog years are converted into human years by multiplying the dog's age by 7. Depending on dog size and breed, however, the conversion looks a bit more complicated, e.g.:

- A one year old dog is roughly equivalent to a 14 year old human.
- 2 years of a dog correspond to 22 years of a human.
- From then on, one year of a dog corresponds to 5 additional years of a human.

Write a program that asks for the age of a dog and then uses the method above to calculate the age in human years.

Exercise 3 ***(Leap years, 2 Points)***

There are 365 or 366 days in a calendar year. According to the Gregorian calendar, a year lasts exactly 365.2425 days, or 365 days, 5 hours, 49 minutes, 12 seconds, or 31,556,952 seconds. You can see that a year is about a quarter of a day longer than 365 days. To compensate for this difference, leap days have been introduced. Every four years a leap day is inserted on February 29th. However, this introduces a new small "error" because we now have one hundredth day too many. For this reason, every hundred years - that is, if the year number is divisible by a hundred - a leap day is omitted. For example, the year 1900 was not a leap year, even though it was divisible by four. However, you still need another correction every 400 years. correction, then a leap day is inserted even though the year number is divisible by a hundred. According to this rule, the year 2000 was a leap year. Now write a Python program that calculates whether a given year is a leap year or not.