Informatik für Mathematiker und Physiker   HS12

Exercise Sheet 2

Submission deadline: 3.15pm - Tuesday 2nd October, 2012

`Course URL`: http://www.ti.inf.ethz.ch/ew/Lehre/Info1_12/

Assignment 1 - Skript-Ausgabe 2,3 & 4 (6 points)

Which of the following character sequences are not C++ expressions, and why not? Here, a and b are variables of type `int`.

For all of the expressions that you have identified, decide whether these are lvalues or rvalues, and explain your decisions.

Determine the values of the expressions that you have identified and explain how these values are obtained. Which of these values are unspecified and can therefore not be determined uniquely?

(b)	`a=(b=5)`	*(c)*	`1=a`
(e)	`(a=5)*(b=7)`	*(g)*	`(a=b)*(b=5)`

Assignment 2 - Skript-Aufgabe 22 (4 points)

Write a program `celsius.cpp` that converts temperatures from degrees Fahrenheit into degrees Celsius.

The initial output that prompts the user to enter the temperature in degrees Fahrenheit should also contain *lower* and *upper* bounds for the allowed inputs. These bounds should be chosen such that no over- and underflows can occur in the subsequent computations, given that the user respects the bounds. You may for this exercise assume that the integer division rounds towards zero for all operands: for example, $-5/2$ then rounds the exact result -2.5 to -2.

The program should output the *correct* result in degrees Celsius as a mixed rational number of the form $x\frac{y}{9}$ (meaning $x + y/9$), where $x, y \in \mathbb{Z}$ and $|y| \leq 8$. For example, $13\frac{4}{9}$ could be output simply as $13\ 4/9$. We also allow for example the output $-1\ -1/9$ (meaning $-1 - 1/9 = -10/9$).

Assignment 3 - (6 points)

Write a program `hotelVat.cpp` that computes from a net amount paid for a room in a hotel (in integral units of CHF) a total amount, including hotel-value-added tax (hVAT). The hVAT rate should be provided to the computation in form of a constant (in one tenth of a percent, to

allow hotel hVAT rates like 3.8%). The net amount is the input. The output (hVAT and total amount) should be rounded (down) to two digits (Rp.) after the decimal point.

An example run of the program may look like this (assuming a hVAT rate of 3.8%).

```
Net amount =?  59
VAT          = 2,24
Total amount = 61,24
```

Challenge - Skript-Aufgabe 12 (8 points)