

Informatik für Mathematiker und Physiker HS15

Exercise Sheet 11

Submission deadline: 15:15 - Tuesday 1st December, 2015

Course URL: <http://lec.inf.ethz.ch/ifmp/2015/>**Assignment 1 – Skript-Aufgabe 146 (4 points)**

We want to have a function that *normalizes* a rational number, i.e. transforms it into the unique representation in which numerator and denominator are relatively prime, and the denominator is positive. For example,

$$\frac{21}{-14}$$

is normalized to

$$\frac{-3}{2}$$

There are two natural versions of this function:

```
// POST: r is normalized  
void normalize (rational& r);
```

```
// POST: return value is the normalization of r  
rational normalize (const rational& r);
```

Write a program `normalize_rat.cpp` in which you implement one of them, and argue why you have chosen this version over the other one. You can take the program `use_rational.cpp` from the lecture website as reference for how to use the `rational` struct.

Hint: you may want to use the function `gcd` from lecture 9, modified for arguments of type `int`.

Judge Examples(Explanation: http://lec.inf.ethz.ch/ifmp/2015/judge_boxes.html)

Rational number r =? 0/10

Normalization: 0/1

Rational number r =? 200/-24

Normalization: -25/3

Rational number r =? -99/-100

Normalization: 99/100

Submission: <https://challenge.inf.ethz.ch/team/websubmit.php?cid=5&problem=MP15111>