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:

```cpp
// 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`.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Rational number r =? 0/10</td>
<td>Normalization: 0/1</td>
</tr>
<tr>
<td>Rational number r =? 200/−24</td>
<td>Normalization: −25/3</td>
</tr>
<tr>
<td>Rational number r =? −99/−100</td>
<td>Normalization: 99/100</td>
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