Humboldt University of Berlin

Einführung in das wissenschaftliche Rechnen

Documentation of Fraction Application Programming Interface and Command Line Interface Calculator

Robert A. Bedard

June 2, 2022

Contents

1 User Manual

Name of the program: bruch
This program allows the user to enter fractions and reduce and add them.
The module tools.3 is required.
After starting it, the user must simply follow the instructions.

2 Documentation

2.1 tools3.py

In this module, we have the two functions to compute the greatest common divisor and the least common multiple. Here, there are no classes, just free functions.

- `ggt(arg1, arg2)` computes the greatest common divisor via Euclidean algorithm.
  - Arguments
    1. `arg1` (int): first integer
    2. `arg2` (int): second integer
  - Returns (int): greatest common divisor of the first and second integer
- `kgv(arg1,arg2)` determines the least common multiple, utilizing the greatest common divisor, computed by the function `ggt(arg1, arg2)`.
  - Arguments
    1. `arg1` (int): first integer
    2. `arg2` (int): second integer
  - Returns (int): least common multiple of the first and second integer.
- `main()` for testing purposes. Takes no arguments and returns none.

2.2 bruch.py

In this module, we have implemented the class Bruch that represents fractions.

2.2.1 class Bruch()

The objects of this class represent fractions.
Attributes

- zaehler (int): the numerator
- nenner (int): the denominator

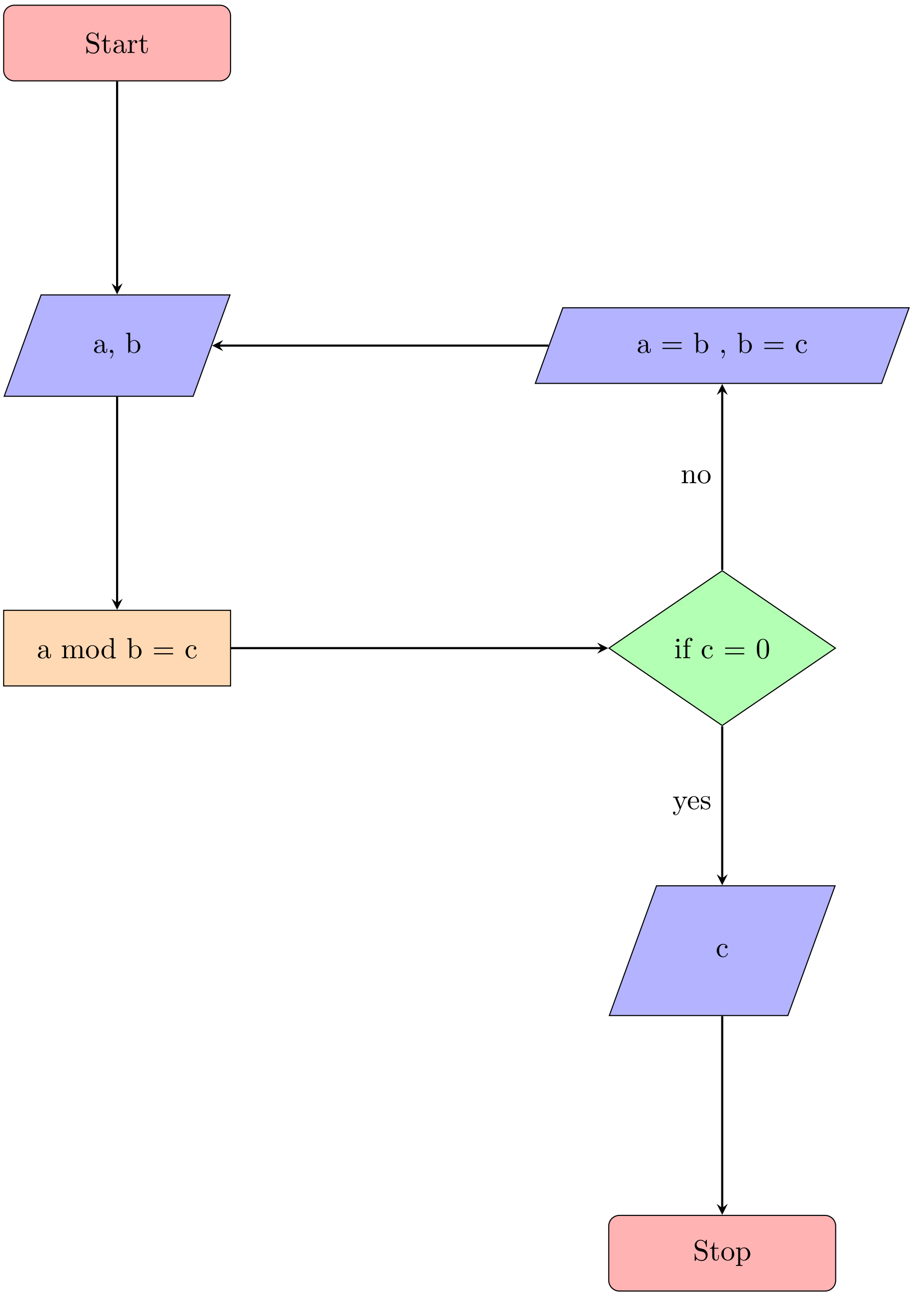
Methodes

- `kuerzen(self)` reduces the fraction. Takes no arguments except for self and returns none.
- `__add__(self, other)` adds two fractions together via finding the greatest common divisor and reduces afterwards. The result is a new Bruch object.
  - Arguments
    1. other (Bruch): another fraction
  - Returns (Bruch): the sum of the two fractions
- `__repr__(self)` returns a printable string.
  - Arguments: none except for self
  - Returns (str): printable string
- `check_validity(self)` checks the fraction for validity. Returns false if the denominator is 0.
  - Arguments: none except for self
  - Returns (boolean): false if the denominator is 0, in any other case true

2.2.2 Free Functions

- `addiere(bruch_1, bruch_2)` adds two fractions into a new fractions
  - Arguments
    1. `bruch_1` (Bruch): first summand
    2. `bruch_2` (Bruch): second summand
  - Returns (Bruch): the sum of the two fractions

3 Euclidean Algorithm



References

[1] Rabus, Helga. *EWR Vorlesung*. Humboldt-Universität zu Berlin, 2022.