**UFPE – CENTRO DE INFORMÁTICA**
**ESTRUTURAS DE DADOS ORIENTADAS A OBJETOS**
**ATIVIDADE PRÁTICA**

(Gustavo Carvalho – ghpc@cin.ufpe.br)

Exercícios selecionados de: KIRCH-PRINZ, U., PRINZ, P.
*A Complete Guide to Programming in C++*.
1a Edição. Editora Jones & Bartlett Learning, 2001.

**Exercise 1**

You are to develop a class that represents fractions and performs typical arithmetic operations with them.

- Use a header file called `fraction.h` to define the `Fraction` class with a numerator and a denominator of type `long`. The constructor has two parameters of type `long`: the first parameter (numerator) contains the default value 0, and the second parameter (denominator) contains the value 1. Declare operator functions as methods for - (unary), ++ and -- (prefix only), +=, -=, *=, and /=. The operator functions of the binary operators +, -, *, / and the input / output operators <<, >> are to be declared as friend functions of the Fraction class.
- Implement the constructor for the `Fraction` class to obtain a positive value for the denominator at all times. If the denominator assumes a value of 0, issue an error message and terminate the program. Then write the operator functions.
- Then write a main function that calls all the operators in the Fraction class as a test application. Output both the operands and the results.

**Exercise 2**

Enhance the above numerical class `Fraction` to convert both `int` values to fractions and fractions to `double`. Use the function `main()` to test various type conversions. More specifically, use assignments and arithmetic functions to do so. Output the operands and the results on screen.