Corso di Laboratorio di Programmazione

Laboratorio 2 – Classi & overloading

26/10/2022

Nota: i quesiti e gli esercizi seguenti sono tratti (ma non tradotti) dal libro di testo.

Discussione

A coppie, rispondete alle seguenti domande (Review, cap. 9, p. 338 sgg.):

1. What are the two parts of a class?
2. What is the difference between the interface and the implementation in a class?
3. Why is a constructor used for the Date type instead of an init_day() function?
4. What is an invariant? Give examples.
5. When should functions be put in the class definition, and when should they be defined outside the class? Why?

Esercizio (#13, pp. 340-341)

Design and implement a rational number class, Rational. A rational number has two parts: a numerator and a denominator, for example 5/6 (five-sixths, also known as approximately 0.83333). Look up the definition if you need to.
Provide:

a. a default constructor initializing the Rational number to 0,
b. a constructor accepting an int argument (representing an integer value that should be represented in Rational form),
c. a constructor accepting two ints for numerator and denominator,
d. assignment,
e. addition,
f. subtraction,
g. multiplication,
h. division,
i. equality (==), greater than (>) and less than (<), and
j. output to stream (<<)
operators. Also, provide a conversion to double via a to_double function.

Test all the overloaded operations in the main function.

Regarding the addition operation, try overloading:

a. the sum of two Rationals, and
b. the sum of a Rational and an int

Both overloads shall be implemented in two ways: using a member function and a helper function (they should not be implemented at the same time!). What are the differences if you sum int + rational vs rational + int?

You should also pay strong attention to the type returned, and whether it should be a variable or a reference.