Corso di Laboratorio di Programmazione

Laboratorio 1 – Classi & overloading
18/10/2021

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?

Esercizi (#12, #5, pp. 339-340)

1. 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. assignment,
   b. addition,
   c. subtraction,
   d. multiplication,
   e. division, and
   f. equality
   operators. Also, provide a conversion to double.

2. Design and implement a Book class similar to the one you would find in a software developed for a library. Class Book should have members for the ISBN, title, author and copyright date. Also store data on whether or not the book has been checked out. Do the following:
   a. Create functions for returning those data values.
   b. Create a function for creating a new book (constructor).
   c. Create functions for checking books in and out.
   d. Do simple validation of data entered into a Book. Store an ISBN as a string, accepting any string configuration.
   e. Implement the == operator that checks whether the ISBN strings are the same for two books.
   f. Have != also compare the ISBN strings.
   g. Have a << operator print out the title, author and ISBN on separate lines.

3. Modify excercise #2 adding a simple validation of the ISBN string, accepting only the form n-n-n-x where n is an integer and x is a digit or a letter.