

# Homework 01 – Class Constructors

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## *Library*

### 2 Exercise 2

The purpose of this exercise is to simulate in a very basic manner the management of a library. The library contains **exemplars** (copies) of **books** written by **authors**. It consists of modeling each one of these elements in your program.

#### 2.1 Description

Complete the source code according to the instructions below.

**WARNING:** you should not modify the main function of the application. It's thus mandatory to proceed as follows:

1. Copy to your PC the archive. Extract the project from the archive, it should contain everything you need to start coding.
2. Write your code that will make the application work with given code.
3. Save and test your program to be sure that it works properly; try for instance the values used in the example given below;
4. Archive and send the project for review.

The provided code creates authors and books of these authors, stores in the library copies of these books, then:

- lists all the copies of this library;
- lists all the copies written in English;
- displays the names of all the awarded authors having written a book of which the library has a copy;
- displays the number of copies of a given book;

A possible execution example is provided further below.

The **definitions** of the **classes Author, Book, Exemplars** (stands for "Copy of a book") and **Library**, described here above, are missing and you are asked to provide them.

The **Author** class.

An Author is characterized by his name (a String) as well as an indication allowing knowing whether he has been awarded.

The methods that are specific to this class and are part of its user interface are:

- **Constructors** that conform to the provided main program, with the following order for the parameters: the name and the indication allowing knowing whether the author has been awarded, default value for award is false.

- A method **GetName** returning the name of the author;
- A method **GetAward** returning true if the author has been awarded.

The **Book** class is characterized by its title (of type string), (a constant reference to the) author who wrote it and the language in which it was written (of type string).

The methods that are specific to this class and are part of its user interface are:

- **Constructors** that conform to the provided main, with the following order for the parameters: the title, the author and the language;
- a method **GetTitle** returning the title of the book;
- a method **GetAuthor** returning a constant reference to the author (this type must be used);
- a method **GetLanguage** returning the language of the book;
- a method **Print** displaying the characteristics of the book respecting strictly the following format:  
     <title>, <author's name>, in <language>  
     where <title> is to be replaced by the title of the book, < author's name> by the name of the author and < language> by its language;
- a destructor displaying a message following strictly the following format:  
     The book "<title>, <author's name>, in <language>" is not available anymore.

We consider here that a book cannot be copied.

See the execution example provided further below for displaying examples.

The **Exemplars** class models a copy of a book. An instance of this class is characterized by a (reference to a) book of which it is a copy.

The methods that are specific to the class Exemplars and that should be part of its user interface are:

- a constructor taking as argument a reference to an Oeuvre and displaying a message respecting strictly the following format:  
     New exemplar of: <title>, <author's name>, in <language>,  
     followed by an End Of Line;
- a copy constructor displaying a message respecting strictly the following format:  
     Copy of one exemplar of: <title>, <author's name>, in <language>,  
     followed by an End Of Line;
- a destructor displaying a message respecting strictly the following format:  
     One exemplar of "<title>, <author's name>, in <language>" was removed!  
     in one line, followed by an End Of Line;
- a method **GetBook** returning a constant reference to the book;
- a **Print** method displaying a description of the copy respecting strictly the following format:  
     Exemplar of: <title>, <author's name>, in <language> without any End Of Line.

The **Library** class is characterized by its name and contains a set of pointers to (Exemplars). The set will be modeled using a vector.

The methods that are specific to the class `Bibliotheque` and are part of its user interface are:

- a constructor that conforms to the provided main method and displays the message:  
The library <name> is open! followed by an End Of Line,
- a method **GetName** returning the name of the library;
- a method **Store** allowing to store one or multiple copies (Exemplars) of a book in the library; it should conform to the provided main, with the following order for the parameters: the **reference to a book** and the **number n of copies** to add; this method will add to the library's list of Exemplars, n Exemplars of the provided Book, which is to be constructed. If the number of copies is not provided, this means that it is 1 by default. Attention, the copies should imperatively be added in the end of the vector;
- a method **PrintBooks** displaying all the copies of a book written in a given language; if no language is given (empty string), all the copies of the library will be displayed; the Exemplars must be displayed with their own display method; they will be separated using End of Lines (see the execution example provided further below);
- a method **CountExemplars** returning the number of copies of a given book passed as a parameter;
- a method **PrintAuthors** with a parameter of type boolean (with false as default value) that displays the names of the author having a copy of one of their books stored in the library. If the boolean is equal to true, only the names of authors with a prize (awarded) will be displayed;  
The name of the author will be displayed as many times as there are copies written by the author.
- a destructor displaying the following message:  
The library <name> closes its gates, and remove its books.  
where <name> is the name of the library, and freeing the memory associated to the stores copies (Exemplars).

## 2.2 Execution example

The library Public Library is open!

New book: Les Misérables, Victor Hugo, in French

New book: Les Misérables, Victor Hugo, in French

New book: L'Homme qui rit, Victor Hugo, in French

New book: Le Comte de Monte-Cristo, Alexandre Dumas, in French

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New book: Le Comte de Monte-Cristo, Alexandre Dumas, in French

New book: Zazie dans le métro, Raymond Queneau, in French

New book: The Count of Monte-Cristo, Alexandre Dumas, in English

The library Public Library offers the next exemplars:

Book: Les Misérables, Victor Hugo, in French

Book: Les Misérables, Victor Hugo, in French

Book: L'Homme qui rit, Victor Hugo, in French

Book: Le Comte de Monte-Cristo, Alexandre Dumas, in French

Book: Le Comte de Monte-Cristo, Alexandre Dumas, in French

Book: Le Comte de Monte-Cristo, Alexandre Dumas, in French

Book: Zazie dans le métro, Raymond Queneau, in French

Book: The Count of Monte-Cristo, Alexandre Dumas, in English

The books in English are:

Book: The Count of Monte-Cristo, Alexandre Dumas, in English

The success authors are:

Raymond Queneau

There are 3 exemplaires of Le Comte de Monte-Cristo

The Public Library closes its gates, and remove its books:

One Book "Les Misérables, Victor Hugo, in French" was released !

One Book "Les Misérables, Victor Hugo, in French" was released !

One Book "L'Homme qui rit, Victor Hugo, in French" was released !

One Book "Le Comte de Monte-Cristo, Alexandre Dumas, in French" was released !

One Book "Le Comte de Monte-Cristo, Alexandre Dumas, in French" was released !

One Book "Le Comte de Monte-Cristo, Alexandre Dumas, in French" was released !

One Book "Zazie dans le métro, Raymond Queneau, in French" was released !

One Book "The Count of Monte-Cristo, Alexandre Dumas, in English" was released !

The book "The Count of Monte-Cristo, Alexandre Dumas, in English" is not available anymore.

The book "Zazie dans le métro, Raymond Queneau, in French" is not available anymore.

The book "Le Comte de Monte-Cristo, Alexandre Dumas, in French" is not available anymore.

The book "L'Homme qui rit, Victor Hugo, in French" is not available anymore.

The book "Les Misérables, Victor Hugo, in French" is not available anymore.