

1. Define the Book class with the following fields: a title, author list (being a list of strings, empty by default), an edition year being an integer number and a unique positive sequential book number (computed for each book using a static field counting all the books). Implement the following public methods of the class:

- the default constructor with parameters for a title and an edition year of the book with some empty/zero default values (setting the book number to the next free value),
- the copy-constructor (ensuring that the books have different sequential numbers),
- the assignment operator (preserving the number of the book to which another one is assigned, and changing the rest of fields),
- set & get methods for the fields of the book (getTitle, setTitle, getYear, setYear, getNumber),
- addAuthor – with an author as a parameter, adding a new author of the book as the last one,
- removeAuthor – with an author as a parameter, removing the author from the book's author list (or throwing an error if the author is not in the author list),
- count – returning the number of books created (it should be a static method),
- the shift operator (<<) – printing all the data of the book.

Write a program which tests all the class capabilities.

2. Define the Clock class representing time intervals with hours, minutes and seconds. Implement the following public methods of the class:

- the default constructor with three parameters for the time components (with zeros by default),
- set & get methods for the time components (i.e., getHours, setHours, etc.),
- the comparison operators <, <=, >, >=, == and !=,
- the arithmetic operators + (the first form which sums two clocks and the second one which adds some seconds to the clock), - (unary and binary) and \* (by a scalar integer value),
- the operator converting the clock to a real value, where the value 1.0 equals to 24 hours,
- the shift operators (>>, <<) for inputting/outputting the clocks in a convenient way.

Write a program which tests all the class capabilities.