Università Degli Studi dell'Aquila

I partial exam of the Algorithms and Data Structures Laboratory course - A.A. 2023/2024
Dr Giovanna Melideo (duration: 1:30 h)

Solve the following Java programming exercises.

Exercise 1

The ISBN (International Standard Book Number) is a unique code assigned to any book by its publisher for tracking and ordering purposes. A *bookstore* is a list of books.

a) Write a class named "Book" that keeps track of book objects such that the instance data contains the book ISBN of type String and the year of first publication.

b) Write a class named "BookStore". In implementing the BookStore class, you should maintain the bookstore in a list and implement the methods supporting the following operations:

1. add a new book if it is not already present, by specifying the ISBN and the publication year as input;
2. verify if the bookstore contains a book, by specifying its ISBN as input;
3. remove a book by specifying its ISBN as input;
4. sort the list of the books in ascending order by ISBN code;
5. sort the list of the books in descending order by book year;
6. output the number of books in the bookstore for each year of publication between 2000 and 2023.

Exercise 2

Write a static generic method that takes as input an array of elements and counts the number of unique objects present within the array. Then, call this method on the Integer type.