Assignment 2

Library Management System using Binary Search Tree data structure

INTRODUCTION

Your second assignment in this block will be using binary search tree data struture for implementing a small Library Management System (LMS) in Java language. These information are:

Book specification

`String code`: the code of the book (this is the key of the tree and thus should be unique).
`String name`: the title of the book.
`int quantity`: the number of books with the same code the library has.
`int lended`: the number of books with the same code, which are still lended. Condition: lended ≤ quantity.
`double price`: The price of the book.

YOUR TASKS

You should use a binary search tree to store data to build a class which provide a Book Service for the web server. You should create the data structures from scratch, do not use structures available in java. Students develop your code in class BookServiceImplement which implements the following interface

```
interface BookService {

 boolean addBook(Book book); // 1. Add book, return true if succeed


 void showBook(int method); // 2-3.print the book in method 1:In-order, method 2:
Breadth-first traverse

 Book searchBookbyCode(String bookCode); // 4.search Book by Code

 int countBook(); // 5.search Book by Code

 boolean removeBook(String bookCode); // 6.remove book

 void printAvailableBook(); //7. print all available books whose lended < quantity

 void balancing(); //8.simply balance the tree

 Book searchBookbyName(String name); //9.simply balance the tree
}
```

1. Add book to BS Tree. Return true if successful.
2. Print the book list with In-order travesal. The method is set 1 when calling the function.
3. Print the book list with Breadth-first travesal. The method is set 2 when calling the function.

4. Search the book by Book code. Return the found book.
5. Count all the books in the library.
6. Remove a book from the library by the code.
7. Print all available books SORTED BY book code. The avaiable books are books whose lended < quantity
8. Balance the tree with simply balancing.
9. Make the second tree to search the book by name.

TASK ASSESSMENT

Your service will be tested with 5 test cases for each function. Your score is Total passed tests / 45.

You may be asked to modify immediately and to explain your assignment in the interview to be sure that you are really the author of the assignment you submitted.