Object Oriented Programming - Lab 4

Monsoon 2023

Date : 13-09-2022

Problem 1

Write a Java program to implement a Library Application. The application should create and manipulate 'Book' objects (Using array of objects is optional). The following operations should be available:

Each book has the following fields:
- Title
- Author
- ISBN
- Total Number of copies available
- Number of copies issued

The following methods should be supported for the Book class

a. searchBook - Given a search string (**which could be partial / full title or author name**) print the details of the book along with copies available

b. issueBook - Given a book object, issue the book by decrementing its number of copies and incrementing issued copies (First it should be ensured that the number of copies is non-zero)

c. returnBook - Opposite of issueBook (increment total number of copies and decrement issued copies). Here also validation should be done beforehand.

d. printBookDetails - print all details of a book

e. printUpperCase - print all details of a book with Title and Author in Uppercase

f. addBook - Add a new book object with the details entered. If there is another book with the same details available, increase the Total number of copies by one instead of creating a duplicate.

g. updateBookName - Takes two arguments. Part of the name of the old book should be replaced with a new string. For example:

updateBookName("Philosophers", "sorcerers") - For this method call, your code should search for books with the substring Philosophers in its title for eg. "Philosophers stone" and should update the name to "Sorcerer's stone".

The following constructors should be present:
- Default constructor
- One Argument constructor
- Three argument constructor
- **Demonstrate all the uses of `'this'` keyword in your code with comments**

2. The driver class should have the following method:
    a. showBooks - print all book names alphabetically

Note:

- Don't use unnecessary print statements in your program. For printing book details always call the printBookDetails method.
- Use proper scope for all members of any classes.
- Additional methods can be used as needed.
- Don't take any input from the user. Initialize the book objects, statically in your program. Hardcode any necessary inputs.
- For string manipulations use java.lang.String class methods. The documentation is available here
- Your code will be checked for plagiarism.

What to turn in

1. LibraryApplication_YourRollnumber.java (**LibraryApplication_S2022XXXXX.java**) which will contain the following classes
    a. Class Book
    b. Class LibraryApplication
2. A Screenshot (jpg/png) of program execution with sample output. (Maximum 2)