Java module 3

Exercises Day 1 (B)

1 - Classes and Objects	Create the classes

Instructions	We will create a program to manage a library.
	
	Step 1: Create the Book class with its properties. Add at least properties to store:
	    ● The title of the book.
	    ● The author of the book.
	    ● The ISBN number of the book.
	    ● The last customer that took the book.
	
	Step 2: Create the Customer class with its properties. Add at least properties to store:
	    ● The customer's name.
	    ● The customer's birthdate. (Use java.util.LocalDate)
	
	Step 3: Modify the Book class to store a reference to a Customer (for the last customer that took the book).

Solution Book.java	<pre>public class Book {
	    public String title;
	    public String author;
	    public String isbn;
	    public Customer lastCustomer;
	}</pre>

Solution Customer.java	<pre>import java.util.Calendar;
	
	public class Customer {
	    public String name;
	    public Calendar birthdate;
	}</pre>

2 - Classes and Objects	Adding methods
Instructions	Let's continue creating the program to manage a library. Step 1: Create the constructor method for the Book and Customer classes created in the previous exercise. Step 2: Create a main library class from where the Bookkeeper is able

	to add a book to the system. Note that a new book won't have been taken by any customer yet. Step 3: Run the program and take a look at the object that was created using the debugger.

Expected output	Book name:
	>>> Harry Potter
	Book author:
	>>> J. K. Rowling
	Book ISBN:
	>>> 978-0590353427
	The book was added.

Solution Customer.java	<pre><code>import java.util.Calendar;

public class Customer {
    public String name;
    public Calendar birthdate;

    public Customer(String name, int birthYear, int
birthMonth, int birthDay) {
        this.name = name;
        this.birthdate = Calendar.getInstance();
        this.birthdate.set(birthYear, birthMonth - 1,
birthDay); //Calendar months start in 0
    }
}</code></pre> |
| Solution Book.java | <pre><code>public class Book {
    public String title;
    public String author;
    public String isbn;
    public Customer lastCustomer;

    public Book(String title, String author, String isbn) {
        this.title = title;
        this.author = author;
        this.isbn = isbn;
        this.lastCustomer = null; //There is no last
customer when a book is created.
    }
}</code></pre> |
| Solution | <pre><code>import java.util.Scanner;</code></pre> |

Library.java	
| | ```java
public class Library {

    public static void main(String[] args){

        Scanner myScanner = new Scanner(System.in);

        System.out.print("Book title: ");
        String bookTitle = myScanner.nextLine();

        System.out.print("Book author: ");
        String bookAuthor = myScanner.nextLine();

        System.out.print("Book ISBN: ");
        String bookISBN = myScanner.nextLine();

        Book book = new Book(bookTitle, bookAuthor,
bookISBN);
        System.out.print("The book was added. ");
        myScanner.close();
    }
}
``` |

3 - Classes and Objects	Adding methods
Instructions	Let's continue creating the program to manage a library.

Step 1: Modify all properties of the Book and Customer classes to be private. Create getter and setter methods for each property.

Step 2: Create a method called "print" for the Book class that will print the book information with the following format:
Book title by Book author. ISBN: isbn-number.

Step 3: Update the main library program such that it will print the book information after adding it.

Step 4: Update the main library program such that it will allow the Bookkeeper to enter the information of the customer that will take the book.

Step 3: Run the program and take a look at the objects that were created using the debugger. |
| Expected output | Book name: |

	>>> Harry Potter
	Book author:
	>>> J. K. Rowling
	Book ISBN:
	>>> 978-0590353427
	The book was added. Book information: Harry Potter by J. K. Rowling. ISBN: 978-0590353427.
	Enter the customer name:
	>>> John Green
	Enter the customer birth day:
	>>> 20
	Enter the customer birth month:
	>>> 5
	Enter the customer birth year:
	>>> 1990
	Book updated with customer information.

Solution
Book.java
	<pre>public class Book {
	    private String title;
	    private String author;
	    private String isbn;
	    private Customer lastCustomer;
	
	    public Book(String title, String author, String isbn) {
	        this.title = title;
	        this.author = author;
	        this.isbn = isbn;
	        this.lastCustomer = null; //There is no last
	customer when a book is created.
	    }
	
	    public String getTitle() {
	        return title;
	    }
	
	    public void setTitle(String title) {
	        this.title = title;
	    }
	
	    public String getAuthor() {
	        return author;
	    }
	
	    public void setAuthor(String author) {
	        this.author = author;</pre>

	``java
	    }
	
	    public String getIsbn() {
	        return isbn;
	    }
	
	    public void setIsbn(String isbn) {
	        this.isbn = isbn;
	    }
	
	    public Customer getLastCustomer() {
	        return lastCustomer;
	    }
	
	    public void setLastCustomer(Customer lastCustomer) {
	        this.lastCustomer = lastCustomer;
	    }
	
	    public void print() {
	        System.out.println(title + " by " + author + ".
	ISBN: " + isbn);
	    }
	}
	``

Solution
Customer.java
	``java
	import java.util.Calendar;
	
	public class Customer {
	    private String name;
	    private Calendar birthdate;
	
	    public Customer(String name, int birthYear, int
	birthMonth, int birthDay) {
	        this.name = name;
	        this.birthdate = Calendar.getInstance();
	        this.birthdate.set(birthYear, birthMonth - 1,
	birthDay); //Calendar months start in 0
	    }
	
	    public String getName() {
	        return name;
	    }
	``

	```java public void setName(String name) { this.name = name; } public Calendar getBirthdate() { return birthdate; } public void setBirthdate(Calendar birthdate) { this.birthdate = birthdate; } } ```
Solution Library.java	```java import java.util.Scanner; public class Library { public static void main(String[] args){ Scanner myScanner = new Scanner(System.in); System.out.print("Book title: "); String bookTitle = myScanner.nextLine(); System.out.print("Book author: "); String bookAuthor = myScanner.nextLine(); System.out.print("Book ISBN: "); String bookISBN = myScanner.nextLine(); Book book = new Book(bookTitle, bookAuthor, bookISBN); System.out.print("The book was added. "); book.print(); System.out.print("Enter the customer name: "); String customerName = myScanner.nextLine(); System.out.print("Enter the customer birth day: "); int birthDay = myScanner.nextInt(); ```

```java
        System.out.print("Enter the customer birth month: ");
        int birthMonth = myScanner.nextInt();

        System.out.print("Enter the customer birth year: ");
        int birthYear = myScanner.nextInt();

        Customer customer = new Customer(customerName, birthYear, birthMonth, birthDay);
        book.setLastCustomer(customer);
        System.out.println("Book updated with customer information.");

        myScanner.close();
    }
}
```