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Object Oriented Programming Using Java Lab
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Assignment – IA: Classes and Objects

A class called **Author** is designed to model a book's author as described below:

| Author |
|---|
| <code>-name:String</code> <code>-email:String</code> <code>-gender:char</code> |
| <code>#Author(name,email,gender)</code> <code>+getName():String</code> <code>+getEmail():String</code> <code>+setEmail(email:String):void</code> <code>+getGender():char</code> |

A class called **Book** is designed to model a book written by an author as shown below:

| Book |
|---|
| <code>-name:String</code> <code>-author:Author</code> <code>-price:double</code> <code>-qty:int = 0</code> |
| <code>#Book(name,author,price)</code> <code>#Book(name,author,price,qty)</code> <code>+getName():String</code> <code>+getAuthor():Author</code> <code>+setPrice(price):void</code> <code>+getPrice():double</code> <code>+setQty(qty):void</code> <code>+getQty():int</code> |

Note the following:

1. Both Book and Author have the same variable called name. However it can be differentiated.
2. Author is one of member type inside the Book class (composition in OOP)
3. public getters/setters: to set and access the private members of the class (supports Encapsulation in OOP)
4. No setter for an attribute – means the attribute cannot be changed.
5. Note the two constructors for Book – constructor overloading.

EXERCISE:

1. Write a *test driver* called `TestBook` to test all the `public` methods.

TEST Your KNOWLEDGE:

1. Introduce new methods called `getAuthorName()`, `getAuthorEmail()` in the `Book` class to return the `name`, `email` of the author of the book and test these methods.

CHANGE IN REQUIREMENTS:

In the example, a book is written by one and only one author. In reality, a book can be written by one or more author. Modify the `Book` class to support one or more authors by changing the instance variable `authors` to an `Author` array.

Note:

1. The constructors take an array of `Author` (i.e., `Author[]`), instead of an `Author` instance.
2. Change the method `getAuthor():Author` to `getAuthors:Author[]`

EXERCISE:

1. Write the code for the `Book` class. You shall re-use the `Author` class written earlier.
2. Write a test driver (called `TestBook`) to test the `Book` class.
