**Chapter 6 Library Lab AP Computer Science**

In this assignment, a driver program will represent a library that manages books and patrons.

A patron has a name and can borrow up to three books. A book has an author and a title. Design and implement two classes, Patron and Book, to represent these objects and the following behavior:

A Book object is instantiated with a title and author and has a getter method for the title and author. Include a toString method.

A Patron object has a name and 3 book instance variables that are Book references. A Patron object has 4 methods:

//postcondition: Returns true if any of the book instance variables is null,

// otherwise returns false

**public boolean canBorrow()**

//precondition: Book b is a book reference

//postcondition: If Book b equals one of the book variables, display a message

//such as “Thank you for returning *bookTitle* by *bookAuthor*” and return true.

//If Book b does not equal any of the book variables returns false

**public boolean returnBook(Book b)**

//precondition : Book b is a book reference

//postcondition: If there is a null book instance variable, set it to b, display a

//message such as ”You have borrowed *bookTitle* by *bookAuthor*” and returns true.

//If there is no book instance variable that is null returns false

**public boolean borrowBook (Book b)**

//precondition: Book b is book reference

//postcondition: Verifies whether Book b is the same as any of the book

// instance variables. Display a message such as

//“*patronName* has *bookTitle* by *bookAuthor”* and returns true

//If book instance variable is not equal to b, method returns false

**public boolean hasBook(Book b)**

The Library class is the driver class (public static void main) and should perform the following tasks:

1. Instantiate a patron (p1) and 4 books (b1, b2, b3 and b4)
2. P1 borrows b1, b2, b3, b4. The Patron class should generate an error message when b4 is returned
3. P1 returns b2
4. Display the current state of P1 (call the toString method)
5. Check if P1 has b1 (yes) and b4 (no)
6. P1 returns b4 ( the returnBook method should generate an error message)
7. P1 borrows b4
8. Determine if p1 can borrow any more books. (no)