Situation: Libraries allow members to borrow books for a defined time period. Typically, a library operates in the following manner:

When a borrow request is made, it must be checked that a copy of the title requested is available. If a copy is available, the librarian must ensure that the borrow request is made by a valid member. This is done by asking for the member's card by the library staff member, which is checked for expiry date and number of books already issued. In case the card has expired, it is returned without an entry and no book is issued, otherwise an entry for issue date and expected return date is made and the book and card are returned.

When a book is returned, the return date is noted and in case it is greater than the expected return date, a fine is charged, whose record is maintained.

Following are the elaborated use cases of the situation above.

 Use case Name: Issue Book

Actor: Librarian

Precondition: Book is unissued and available

Post condition: Book is issued.

User Actions	**System Response**
i. The user enters the Borrower's card number to check its expiry date.	i. System responses with the validation message. **Exp1**
ii. The user enters the book's information (title, ISBN, author) to check its availability.	ii. System responses with the availability of the book. **Exp2**
iii. The user directs the system to issue the book. **Alt1**	iii. The system responses with the issuing message after recording the issue date and expected return date. Use case ends.

    Exception 1: Card is not validated. No book is issued. Use case ends
    Exception 2: Book is not available. Go to step ii or ends the use case.
    Alternative 1: User directs the system to cancel the transaction. Use case ends.

Question: Draw the state chart diagram of the object of the class Borrower-Book for the above use case. Consider the following Class Diagram for the detail of the attributes of Borrower-Book. Also draw the activity diagram of the above use case.

Borrower-Book

issueDate
returnDate
fine

issueBook( )
returnBook( )
viewOutstandingByBorrower( )

Borrower

LibCardNo
LibraryCardExpiryDate
Name
Email
Phone
Address

addBorrowe( )
viewBorrower( )
updateBorrower( )
deleteBorrower( )

* Borrows *

Book

Title
ISBN
Author
isuueStatus
Price

addBook( )
viewBook( )
updateBook( )
deleteBook( )