**Department of Computer Science**
**Software Engineering (CSC342)**
**Tutorial 6**
**(Use Case Modeling)**

**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.
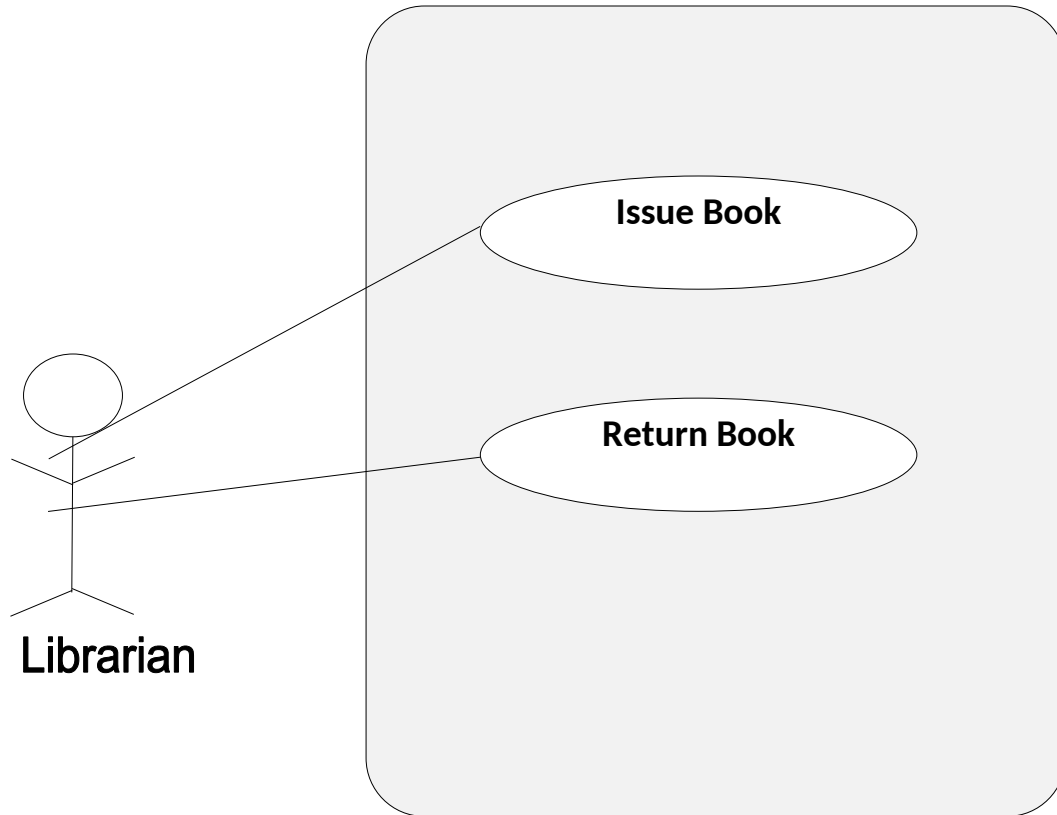
a) **Question:** Write at least 2 functional requirements of the library system along with the use case model.
b) Write elaborated use case for the functional requirements that you have already identified in previous part.

# Answer:

# (a)The Functional Requirements:

1. The System shall be able to issue book to the borrower.
2. The System shall be able to return book borrowed by the borrower.

# Use case Model:



(b)

*__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.

### Use case Name: Return Book

*Actor: Librarian*

*Precondition:* Book is issued.

Post condition: Book is unissued.

| **User Actions** | **System Response** |
|---|---|
| i. The user enters the book's information (title, ISBN, author) to check its availability | i. System displays the book information including issue, return date and fine if any. **Exp1** |
| ii. The user directs the system to return the book. **Alt1** | ii. The system responses with the successful return of the book after updating the status of the book, return date and fine if any. Use case ends. |

Exception 1: Book is not available. Information is wrong. Go to step i.
Alternative 1: User directs the system to cancel the transaction. Use case ends.