



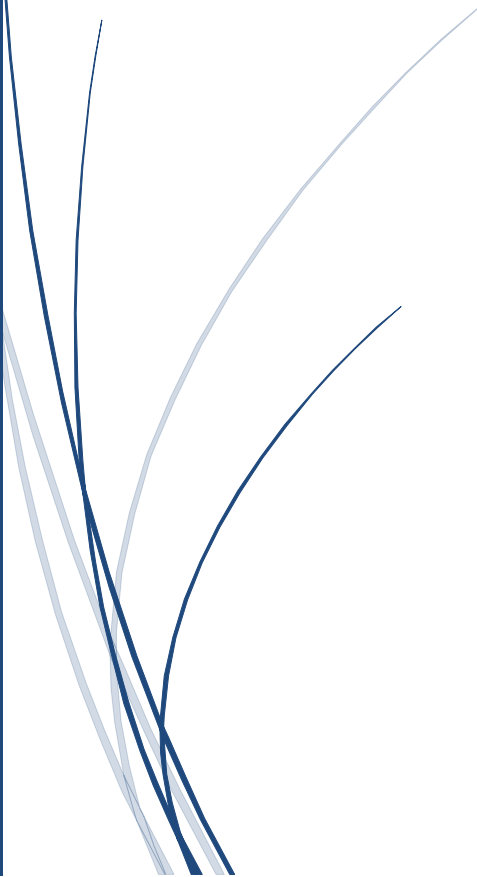
11/19/2019

Library Management System

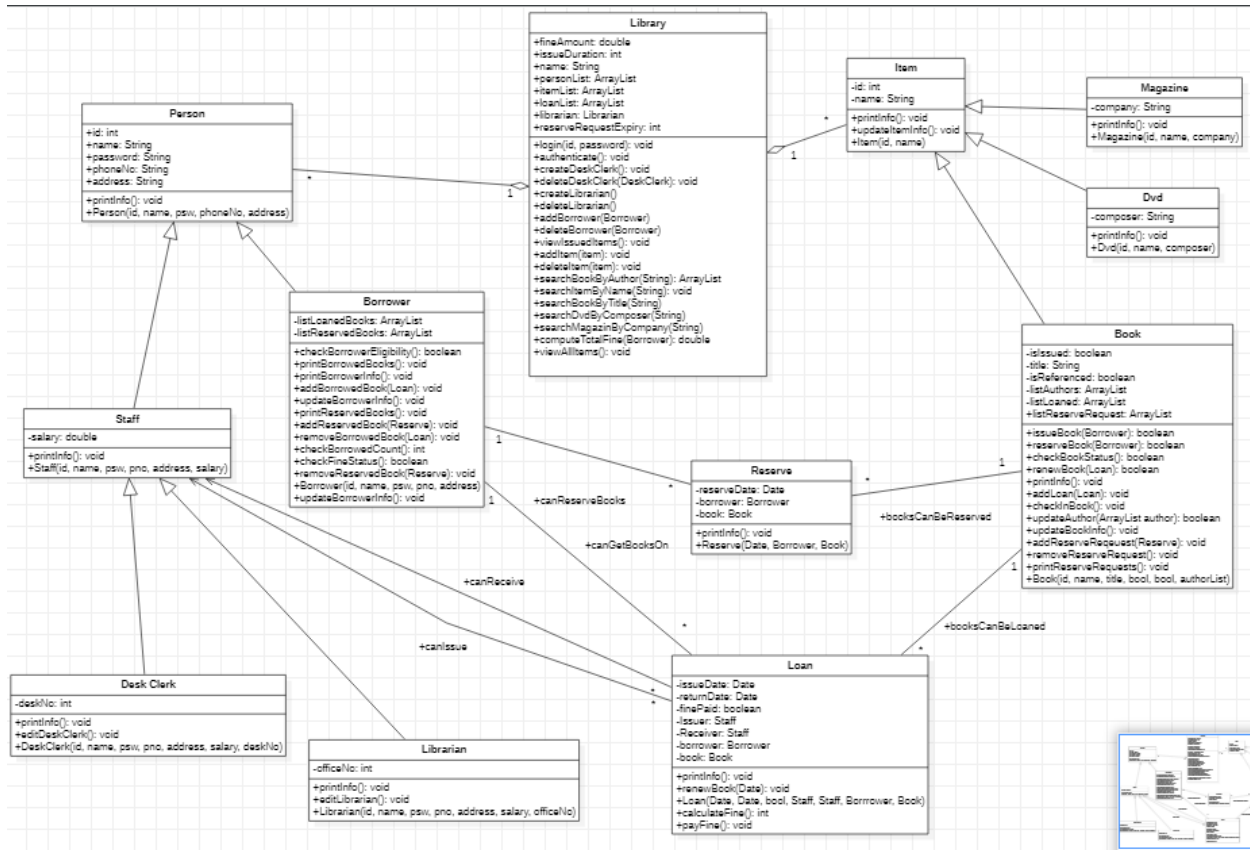
[OOAD Project]

Group Members

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Class Diagram



Class Responsibilities

NOTE: Constructors, getters, and setters have not been mentioned in the methods as they will obviously be written in that particular class.

1) Class: Book

Methods:

i) updateBookInfo(), updateAuthor(), printInfo(), printReserveRequests(), checkBookStatus().

These are placed inside the book class as they will be invoked with a book instance.

ii) issueBook(borrower), reserveBook(borrower), checkInBook(borrower, staff).

These could be placed in any of the three classes involved in the relationship (loan, book, borrower). They cannot be written inside loan class as a loan object is created later on in the execution. It is placed in book class as we have to check bookStatus before issuing, reserving and checkingIn.

iii) addLoan(loan), addReserveRequest(Reserve), removeReserveRequest(Reserve).

Book class contains lists for loan, reserveRequests. Therefore, functions which manipulate the lists must be placed inside that particular class.

2) Class: Loan.

Methods:

i) printInfo()

Placed inside Loan class as it needs to print information regarding the loan, i.e, issueDate, returnDate etc.

ii) renewBook(Date)

The issueDate is an attribute of the Loan class. To extend the due date of an issued book, the issuedDate must be extended. Therefore, this function has been assigned this responsibility.

iii) calculateFine()

Fine is calculated based on the difference between returnedDate and issueDate, which are attributes of the loan class. Therefore, this method is written in loan class.

3) Class: Borrower

i) printBorrowedBooks(), printReservedBooks(), printInfo(), updateBorrowerInfo().

These are placed inside the borrower class as they will be invoked with a borrower instance.

ii) checkBorrowerEligibility(), checkBorrowedCount(), checkFineStatus().

These methods return boolean values based on attributes stored in the borrower class (list of borrowedBooks).

iii) addBorrowedBook(loan), addReserveBook(Reserve),
removeReservedBook(loan), removeBorrowedBook(loan).

Book class contains loanBooks list and reserveBooks list.
Therefore, methods which manipulate these lists must be placed in the same class and have been given the responsibility to do so.

4) Class: Reserve

Methods:

i) printInfo()

This method prints information regarding the reservation made by a user, i.e, reservation date, borrower and the book which has been reserved.

5) Class: Desk Clerk / Librarian

Methods:

i) editDeskClerk() / editLibrarian()

This method is invoked with a desk clerk / librarian instance to update the information and hence, has been placed in the respective classes.

ii) printInfo()

This method prints information regarding the desk clerk / librarian, i.e, name, id, salary etc. To access the private attributes, it must be placed inside the respective class and has been done so.

6) Class: Item

Methods:

i. printinfo()

This method prints the library item's info. The child classes of item inherit this function and override it.

ii. updateItemInfo()

This method updates the item's info.

7) Class: Magazine / DVD

Methods:

i. printInfo()

This method prints the items' info. This is an overridden function which is used for polymorphism.

8) Class: Library

i. createDeskClerk()/deleteDeskClerk(DeskClerk):

These functions are used to create and delete desk clerks from the list of desk clerks. Only Librarian will be able to do this.

ii. createLibrarian()/deleteLibrarian():

These functions are used to create and delete the librarian. Only Admin will be able to do this.

iii. addBorrower()/deleteBorrower(Borrower):

These functions are used to create and delete borrowers from the list of borrowers.

iv. addItem()/deleteItem(Item):

The add function is used to add a new item to the library's list of items and the delete function is used to delete an existing item.

v. searchBookByAuthor(String)/searchBookByTitle(String):

These functions search in the list of books on the basis of Author or Title.

vi. searchItemByName(String):

This function searches the whole list of items for the given input.

vii. searchDvdByComposer(String) / searchMagazineByCompany():

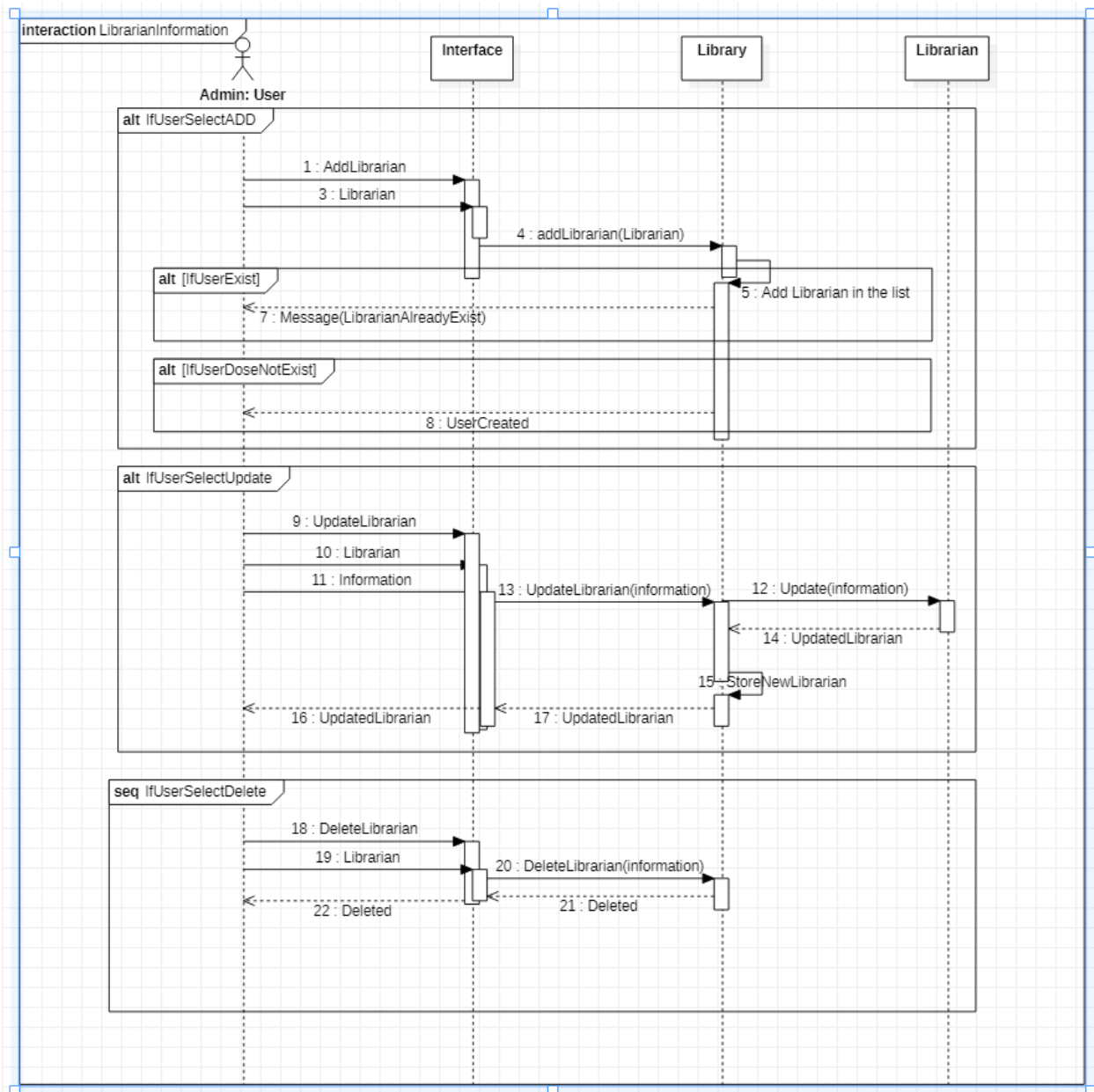
These functions search the selected item on the basis of either Company (for magazine) or Composer (for DVD).

viii. computeTotalFine(Borrower):

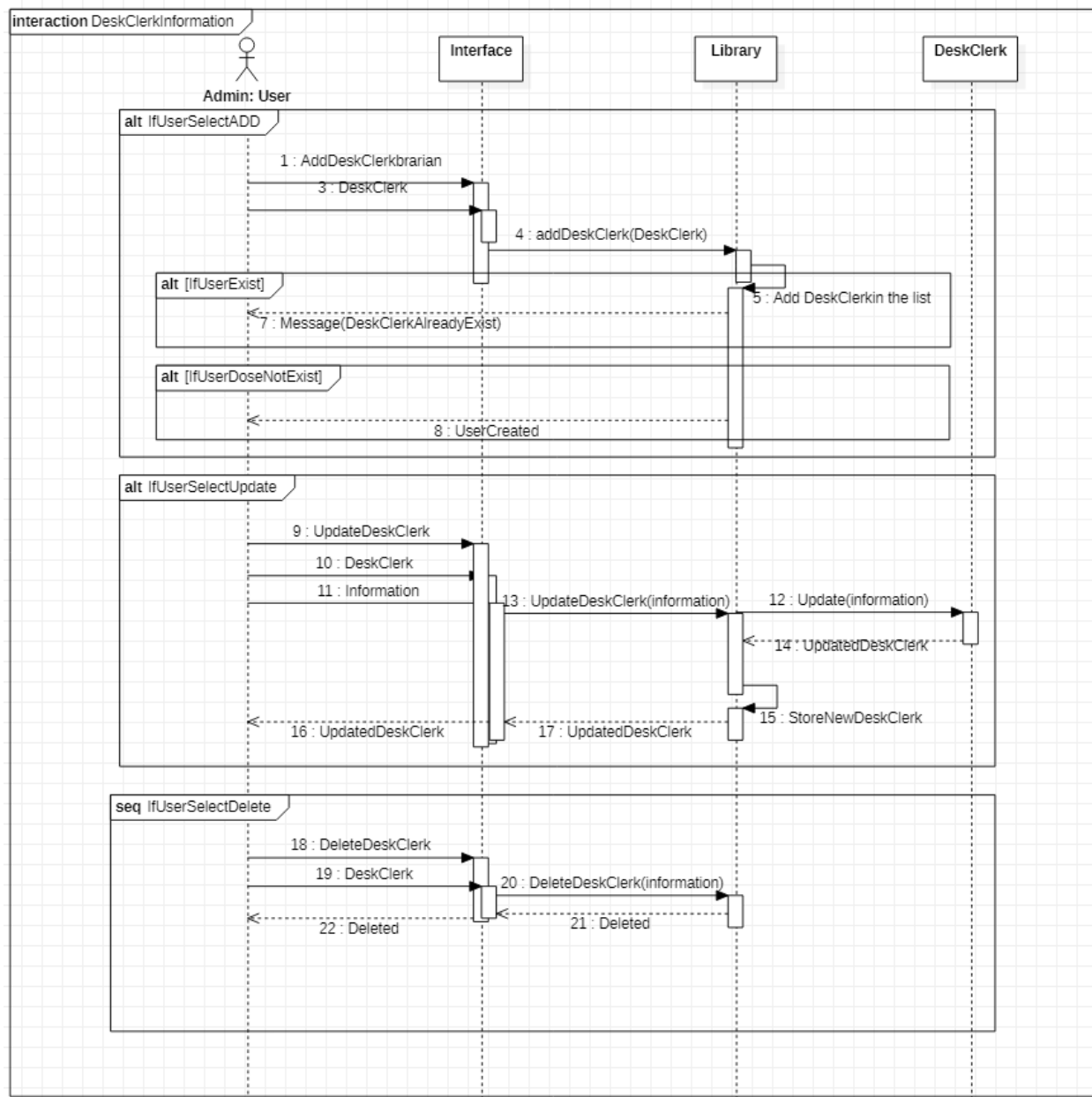
This function calculates the total payable fine of the given borrower. It goes through the load list in the borrower and calculates the total fine.

ix. viewAllItems():

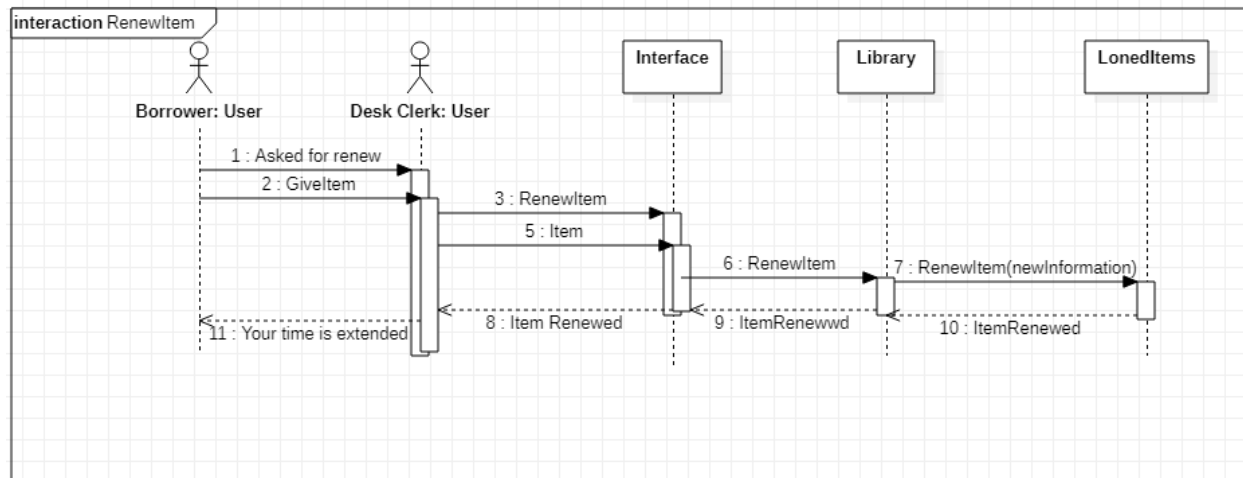
This function displays the list of all library items.

Sequence Diagrams**i) Husnain****a)Maintain Librarian Information.**

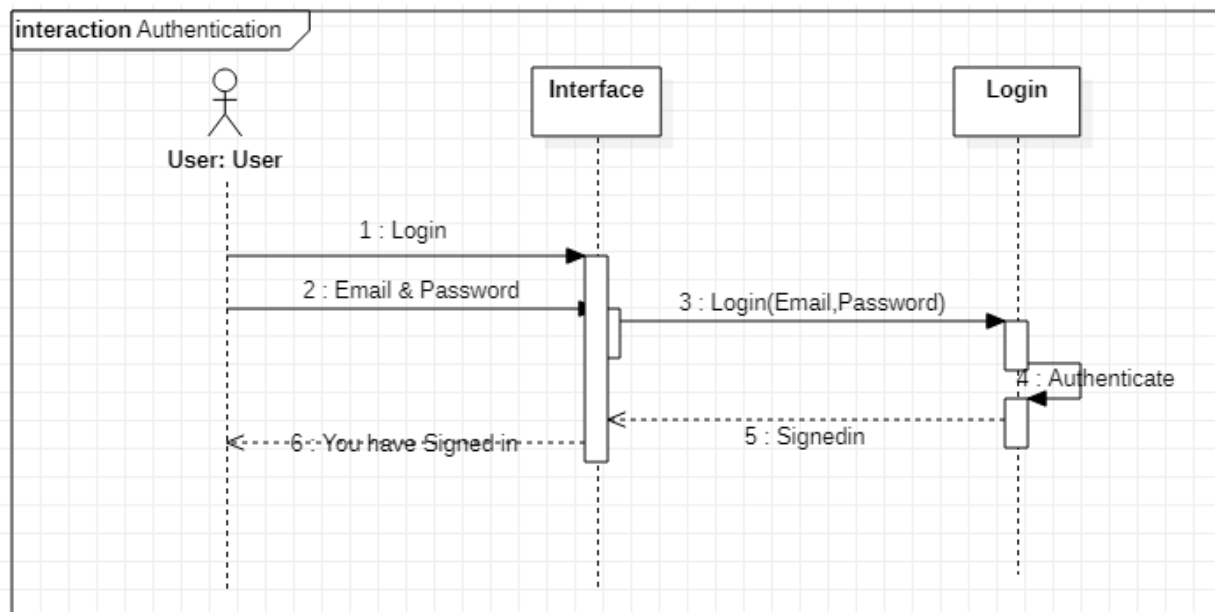
b) Maintain Desk Clerk Information.



c) Renew Item

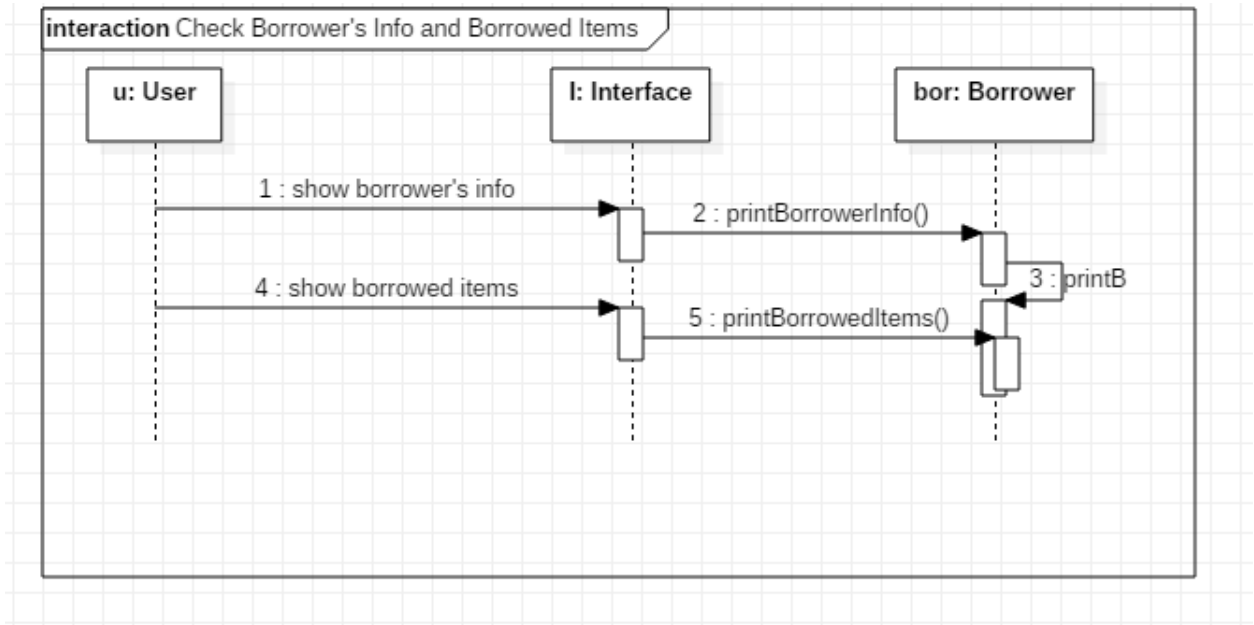


d) Authorization.

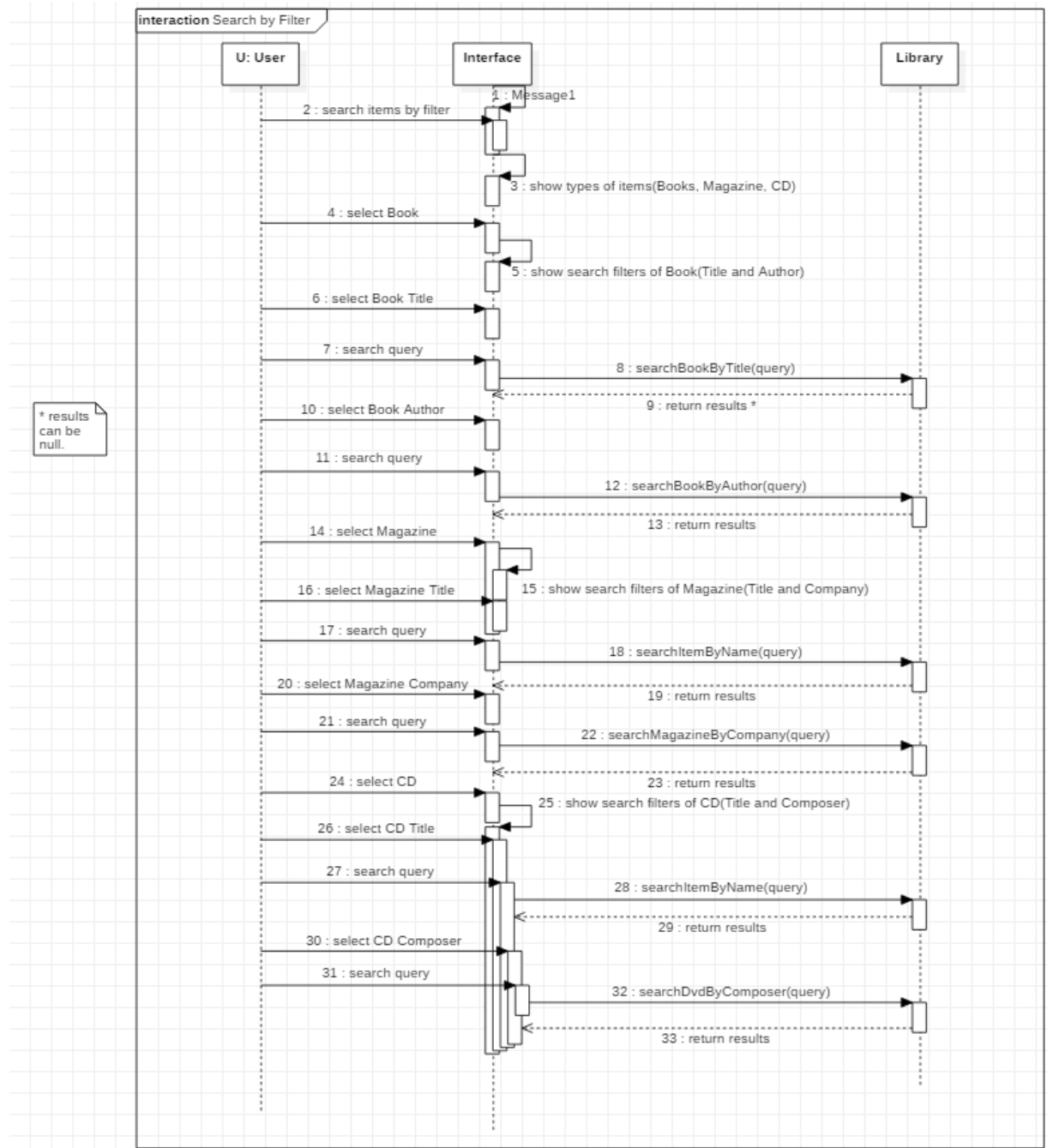


ii) Sajjad

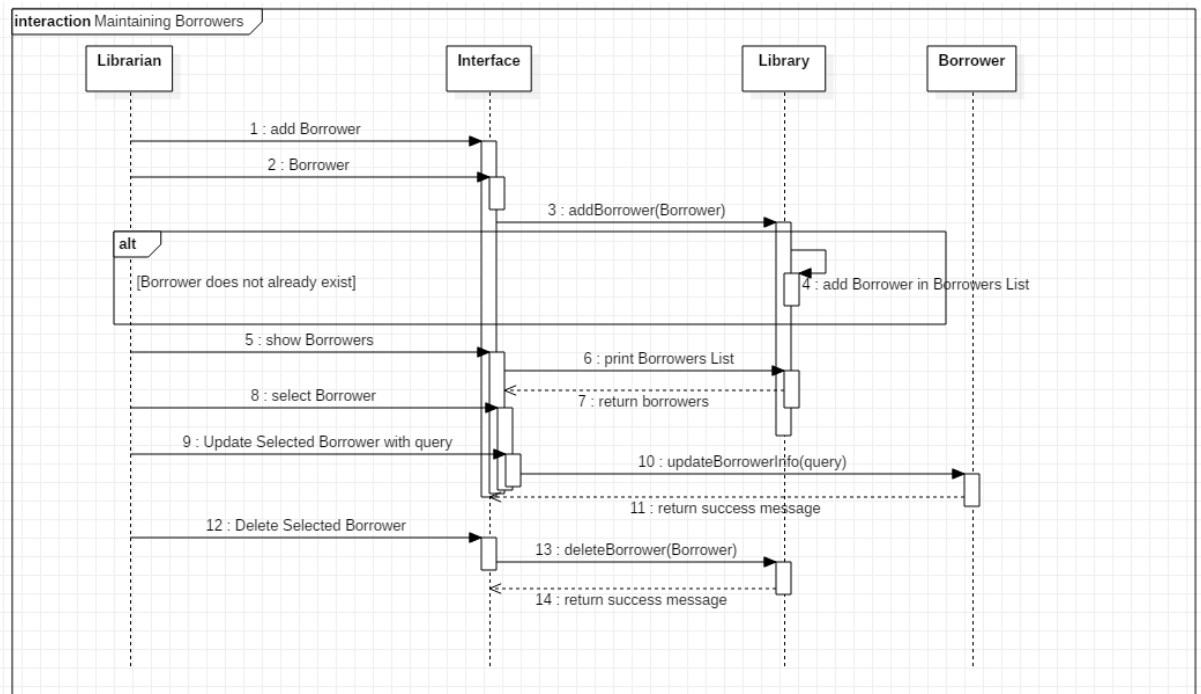
1. Check Borrower's Info and Borrowed Items



2. Search By Filter

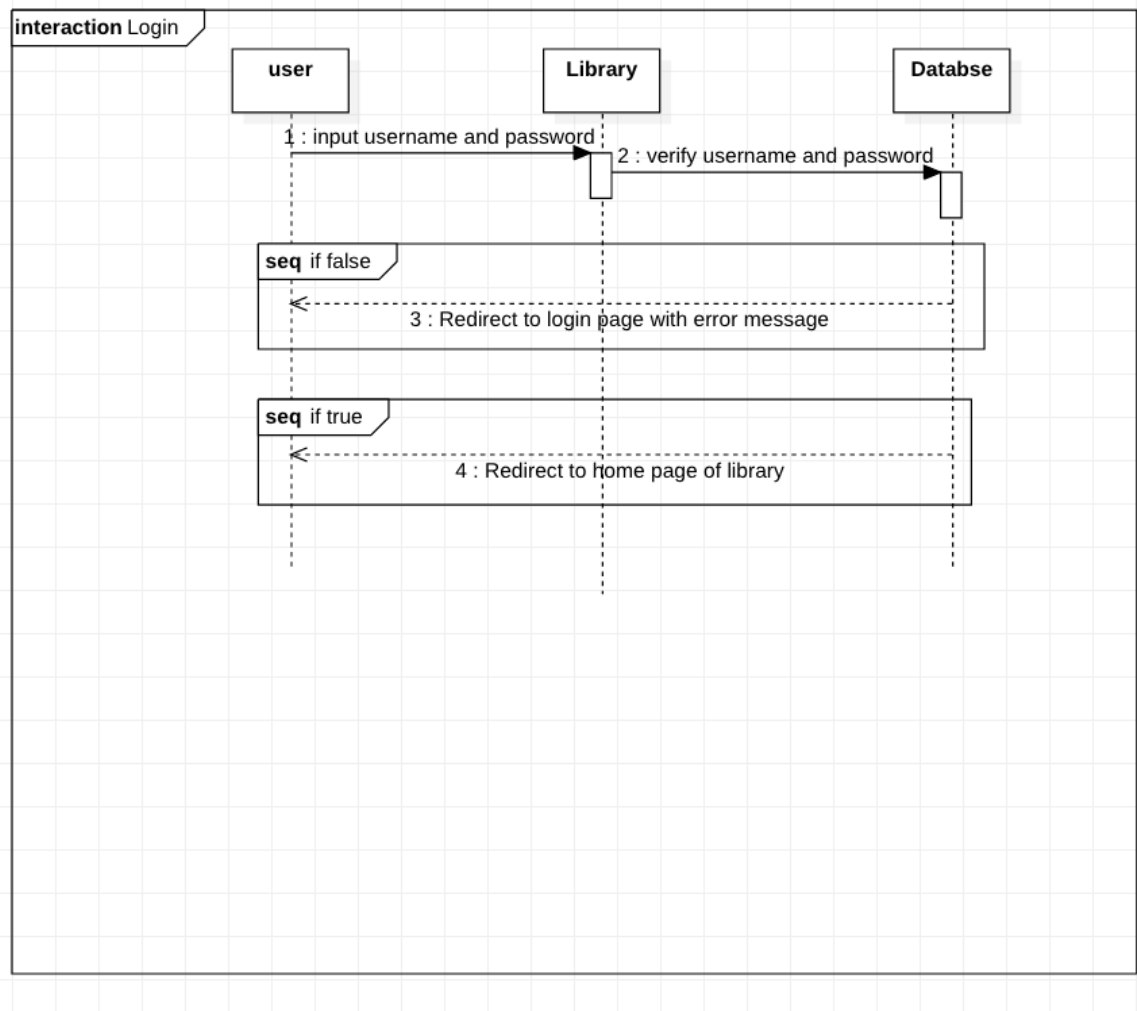


3. Maintaining Borrowers

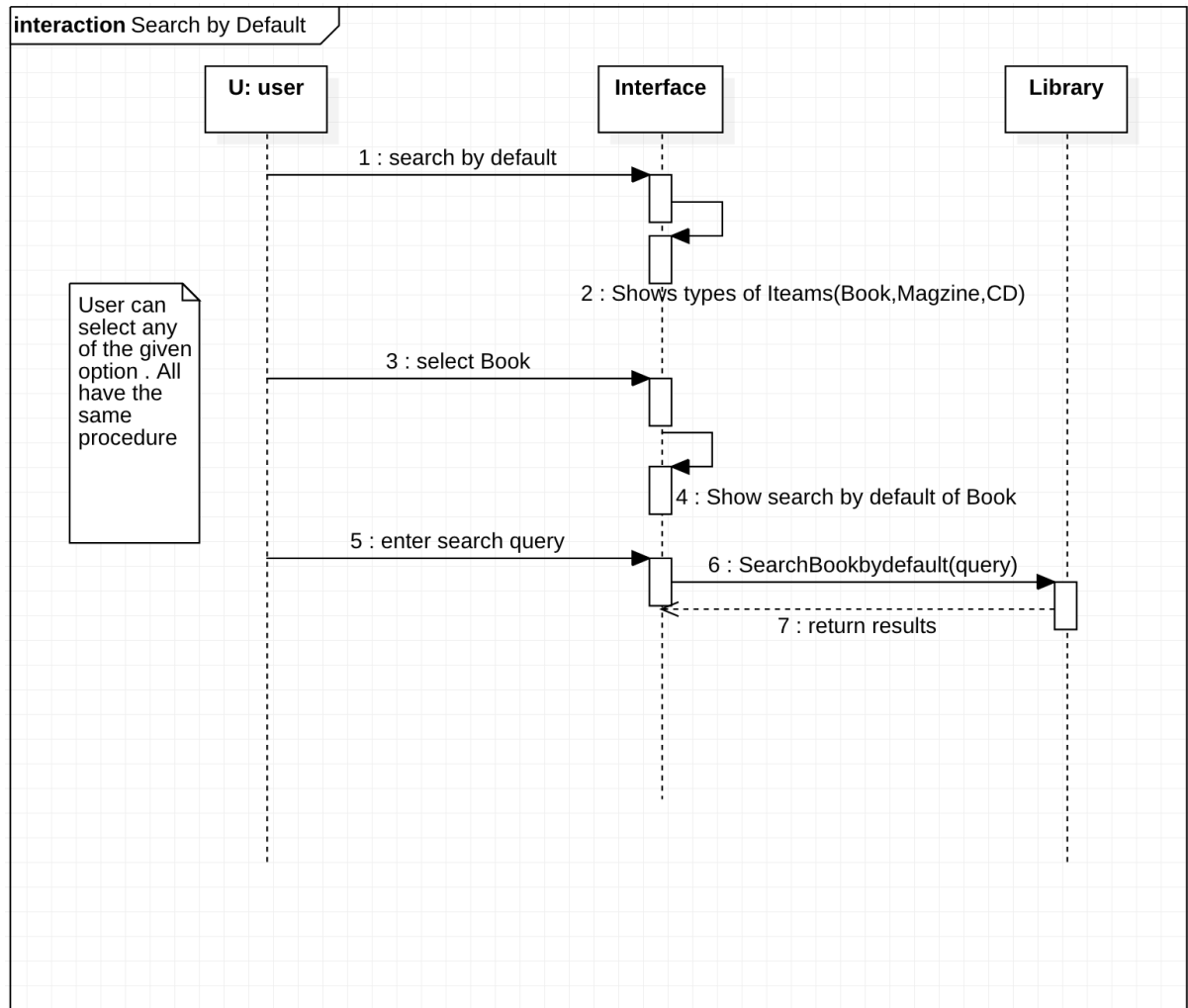


iii) Moaz

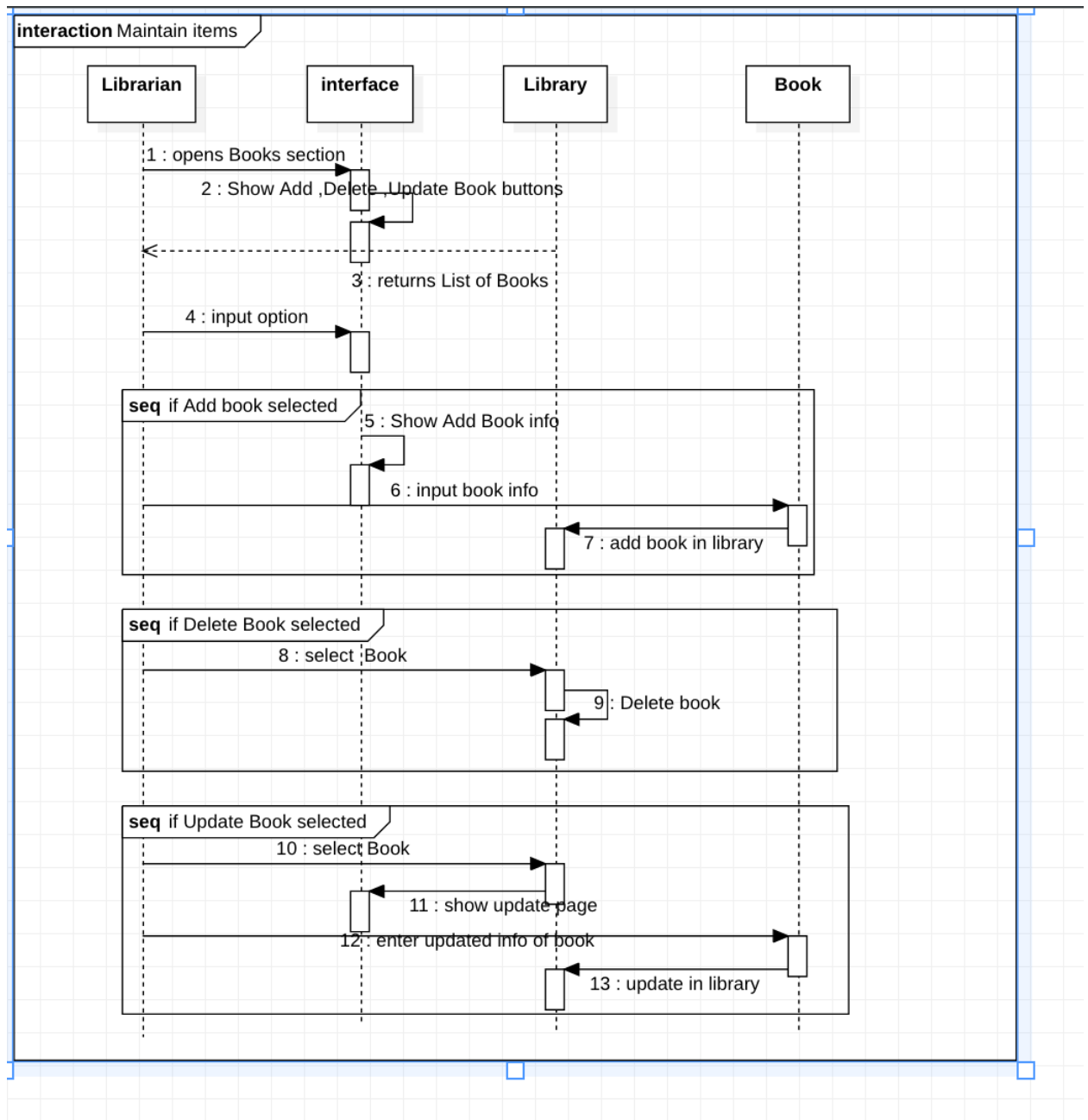
1.login



2. Search by Default

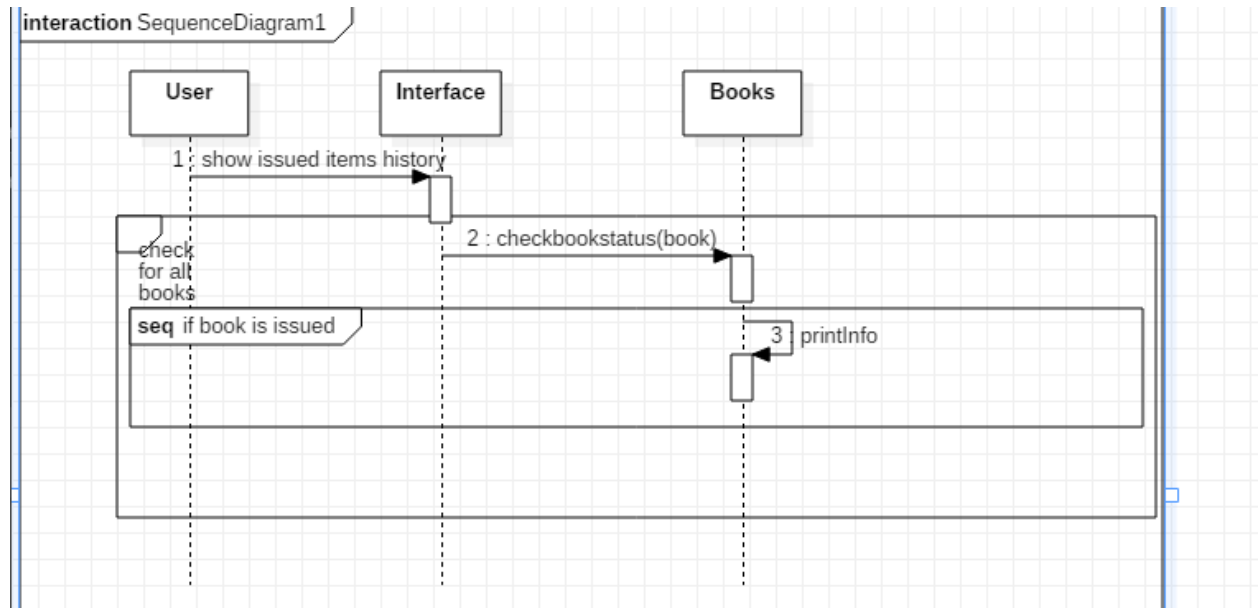


3. Maintain items

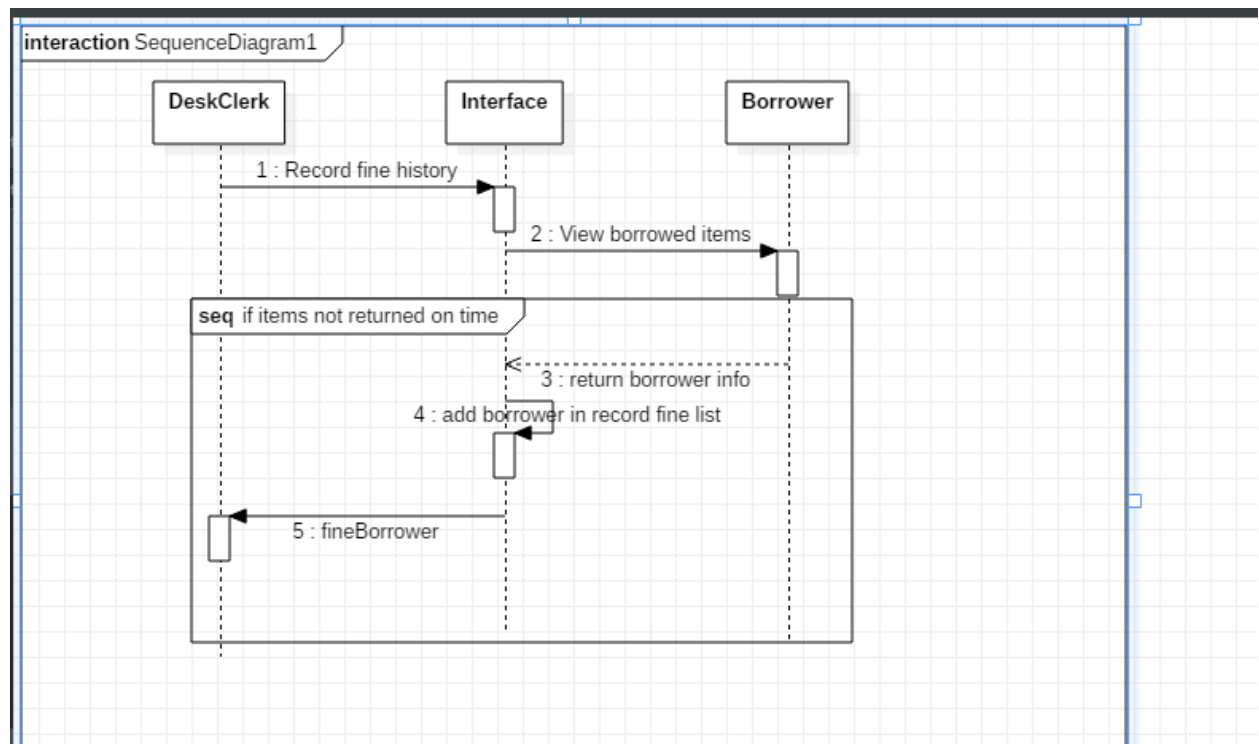


iv) Murtaza(L174239)

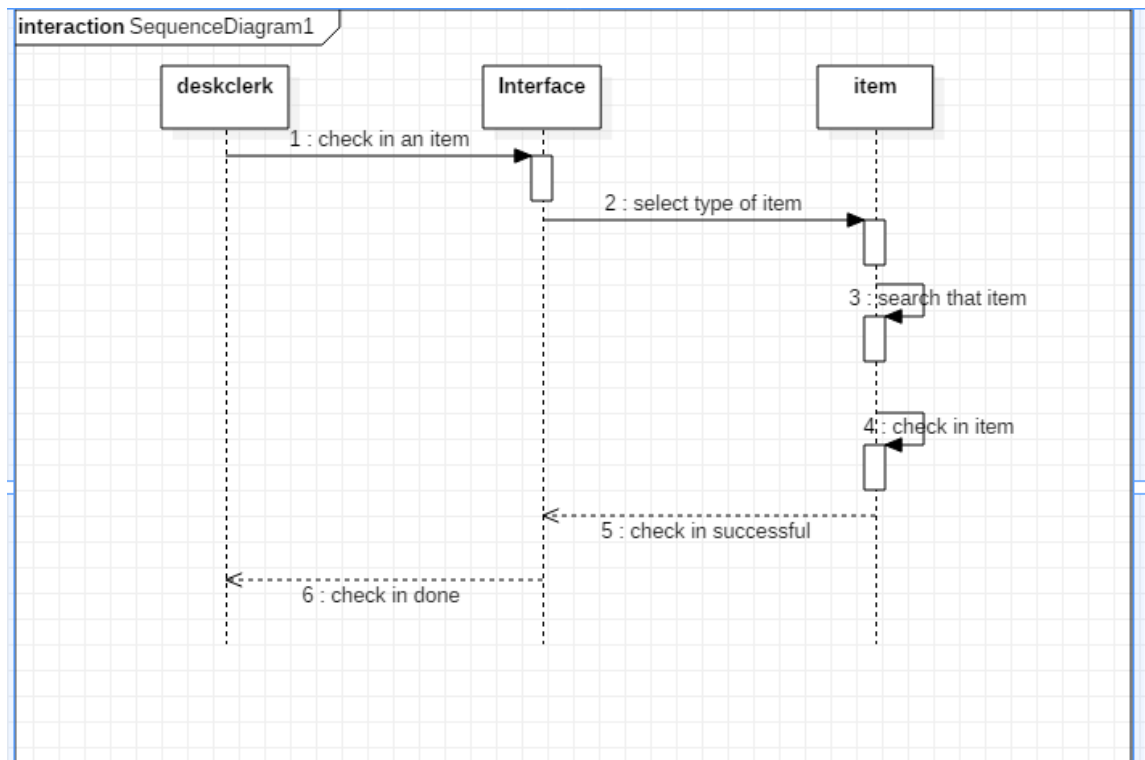
1-View issued items history:



2-Record fine payment:

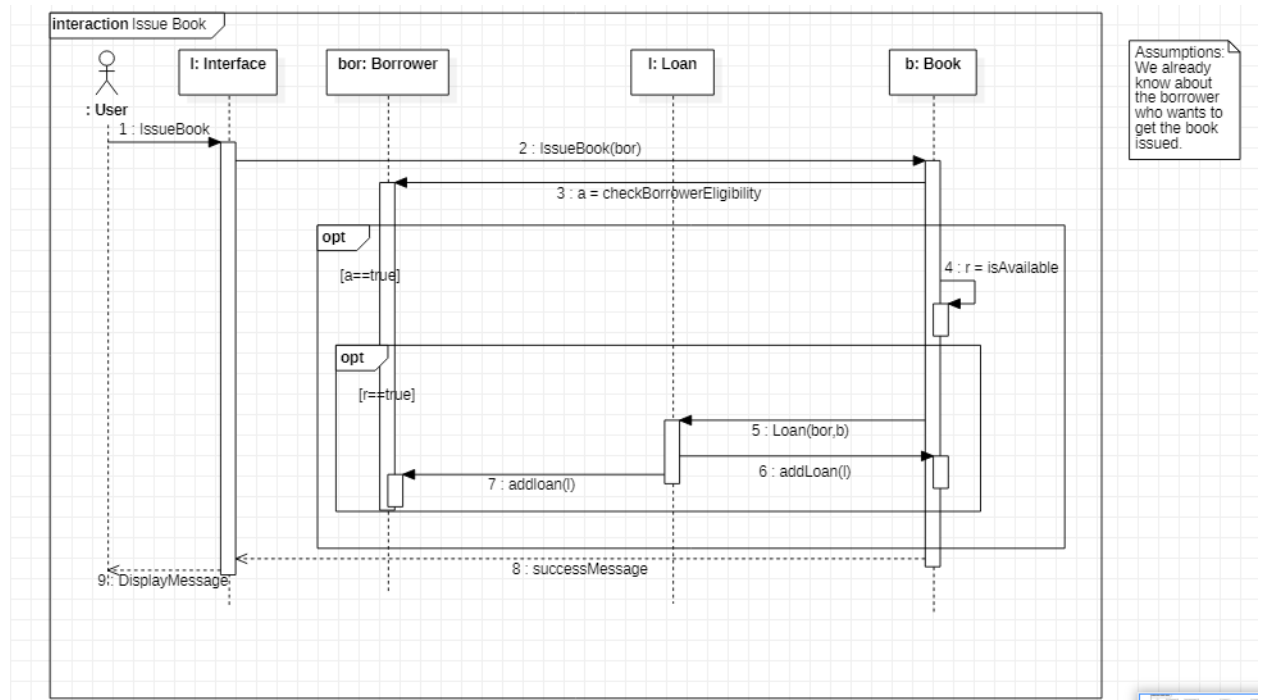


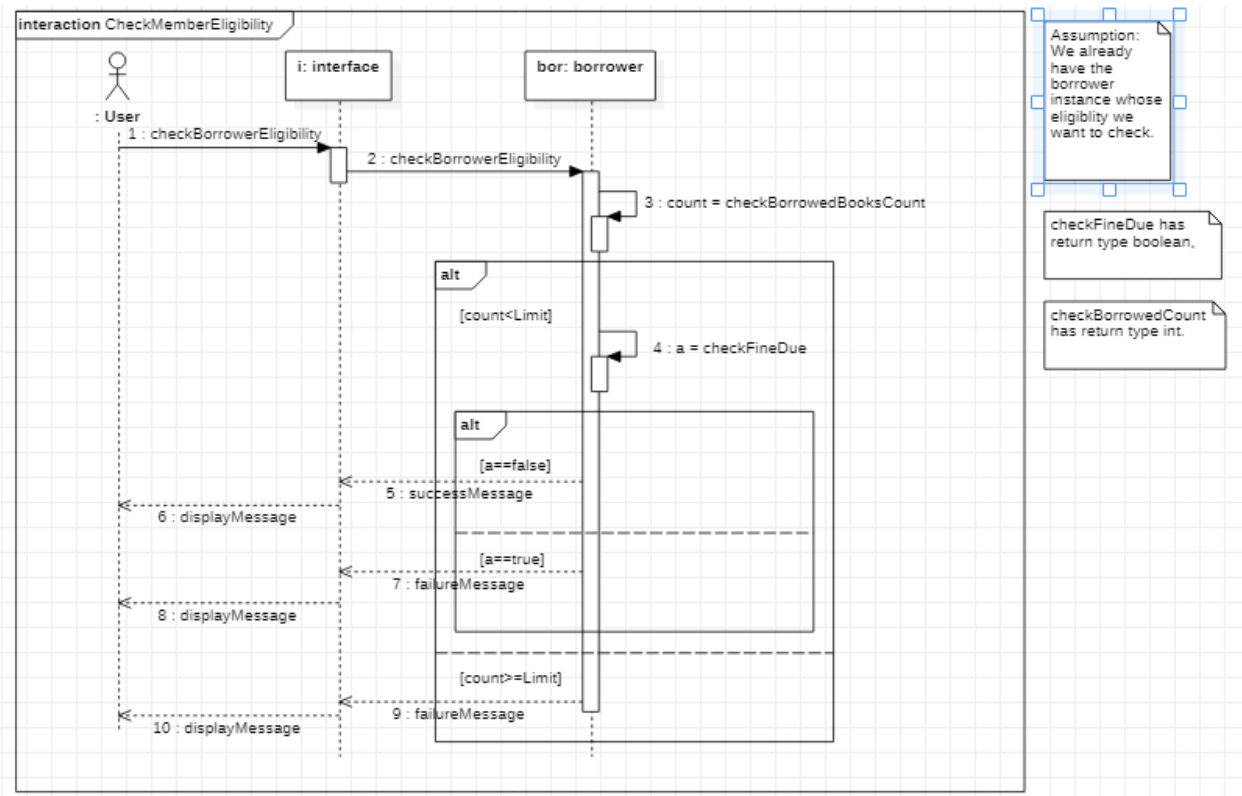
3-Check in an item:

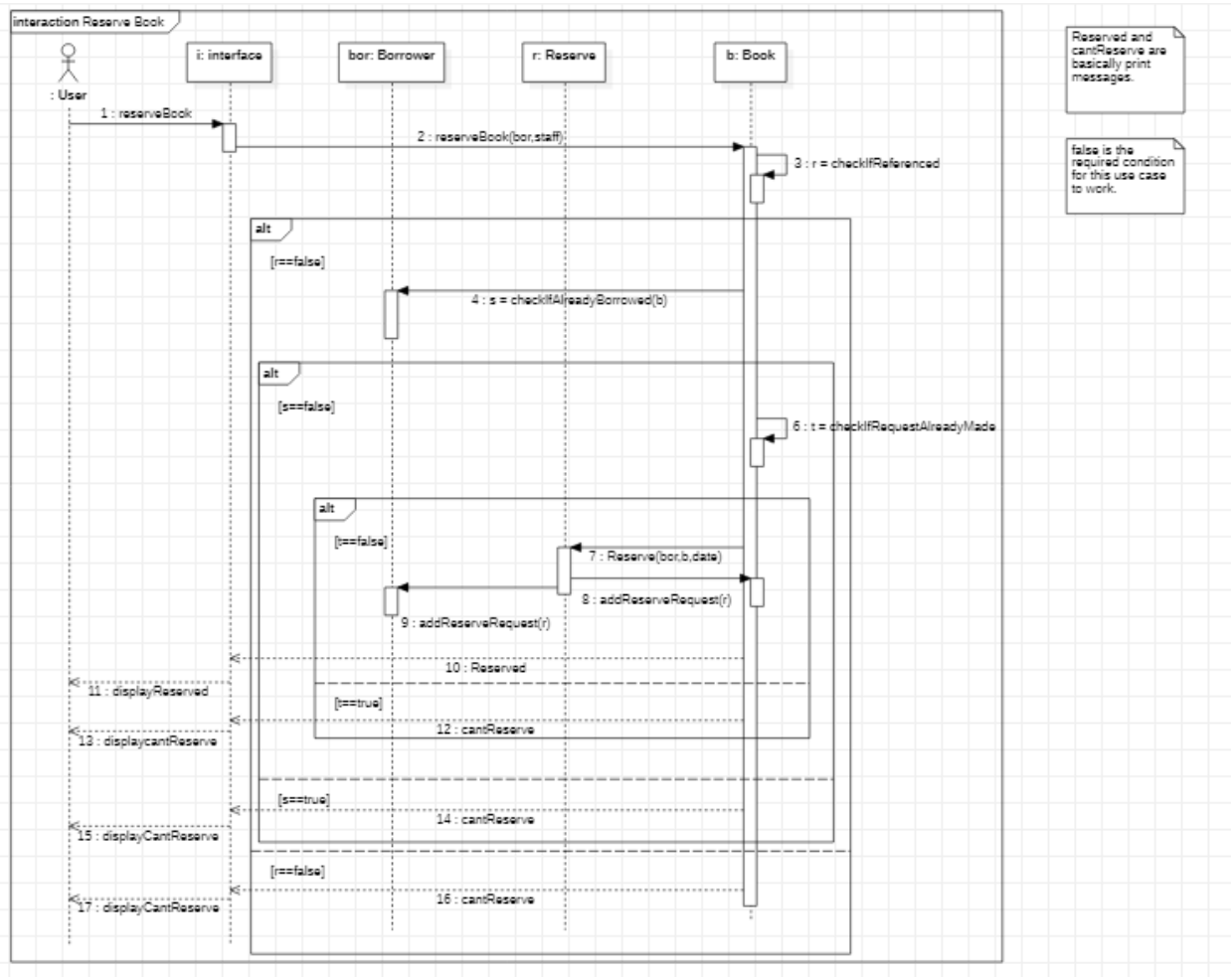


v) Mehboob (117-4316)

i) Sequence Diagram: Issue Book



ii) Sequence Diagram: Verify borrower's Eligibility

iii) Sequence Diagram: Reserve a book

iv) Sequence Diagram: Verify Book Status