

**IT313 – Software Engineering**  
**LAB 7 - Domain Analysis Modeling & Sequence Diagram**



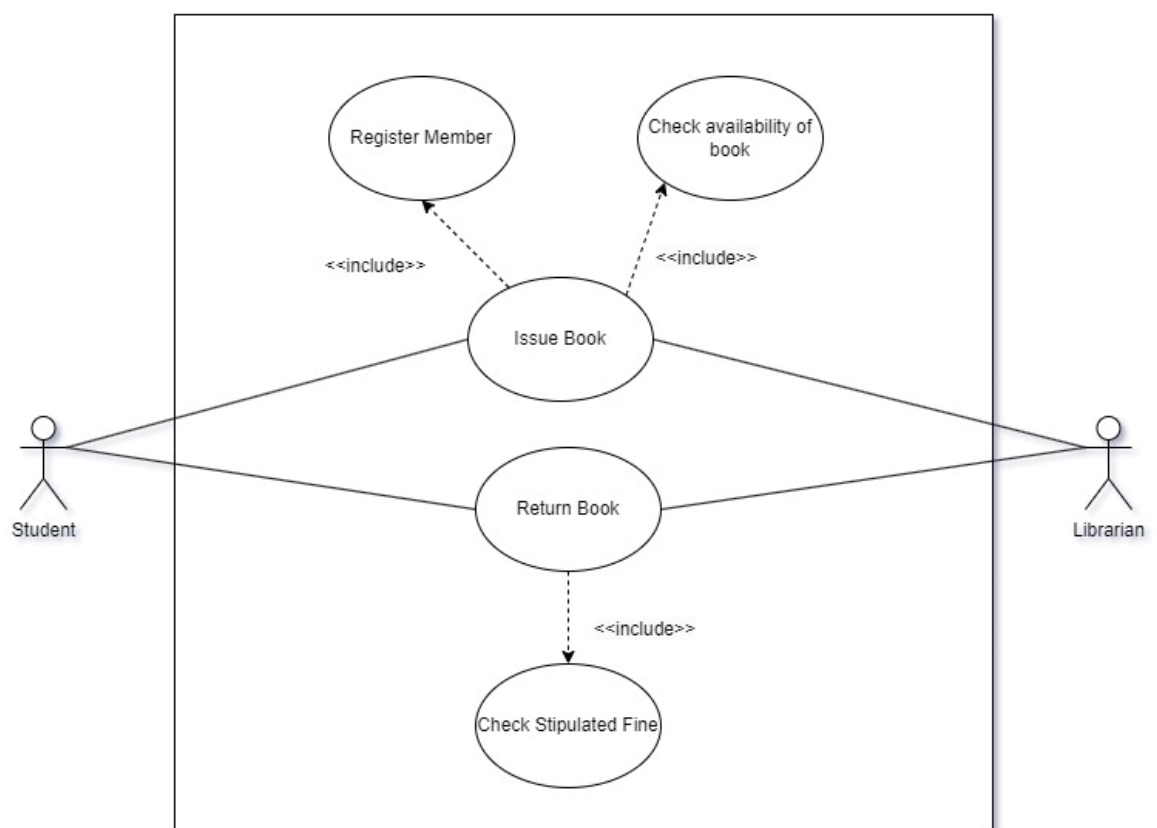
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**Lab Group 6**

**Q.1. Consider the following piece of text**

**“A library maintains multiple reading materials which include books, journals, and magazines. The books are issued to the registered students of the institute, for a specified period of time. The issued books are to be returned back to the library. Delayed returns are subjected to stipulated fines. The issue-return process is administered by one of the librarians through an authenticated Library Management System.”**

**An incomplete use case diagram for the system is given above. Develop the following documents:**

- 1. Complete the use case diagram for the above problem text along with use case documentation for “issueBook” use case.**



### **Use Case Documentation:**

Use Case Name: Issue Book

Use Case ID: UC-01

Actor: Librarian, member (student)

Preconditions:

- The librarian must be logged into the Library Management System.

Postconditions:

- The book is successfully issued to the library member.
- The book's availability status is updated in the system.

Main Success Scenario:

1. The student approaches librarian.
2. The librarian asks the student for their library card or membership identification.
3. The student provides their library card or membership ID to the librarian.
4. The librarian enters the library member's identification information.
5. The system validates the library member's identification information.
6. The librarian selects the "Issue Book" function in the Library Management System.
7. The system updates the book's status as "Checked Out" and calculates the due date based on library policies.
8. Associates the book with the library member who checked it out and records the changes.
9. The librarian provides the borrowed book to the student.

Alternate flows:

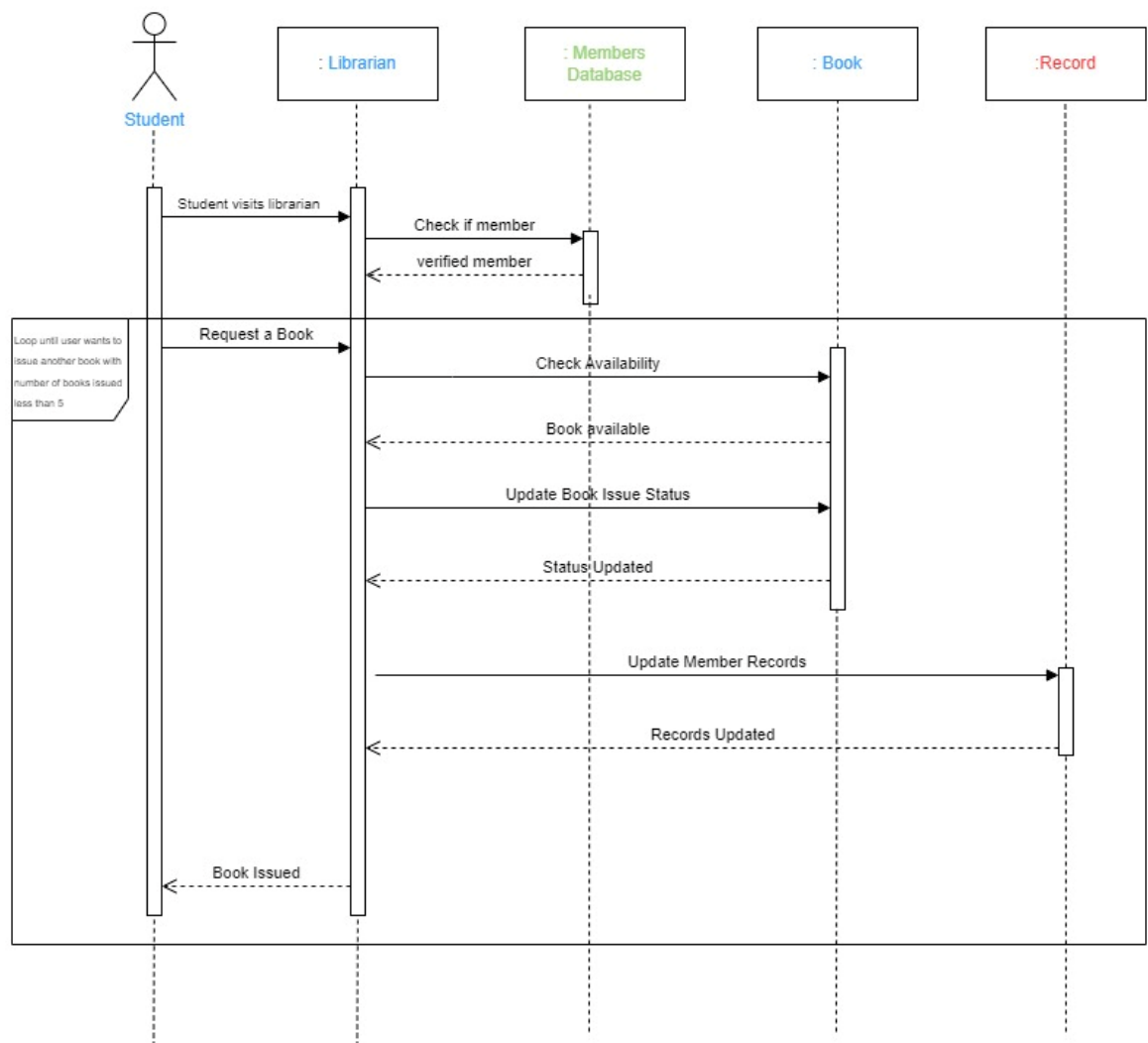
- 5a. If the information is invalid, display an error message return to STEP-2.

Extension:

Cancel Transaction

At any point in the main success scenario, the librarian may choose to cancel the transaction. If cancelled, the use case concludes without issuing the book.

2. The sequence diagram for the “issueBook” use case. (Hint: Here you need to identify various analysis objects (corresponding to entity, boundary, and control classes), and show their interaction to realize the “issueBook” use case.)

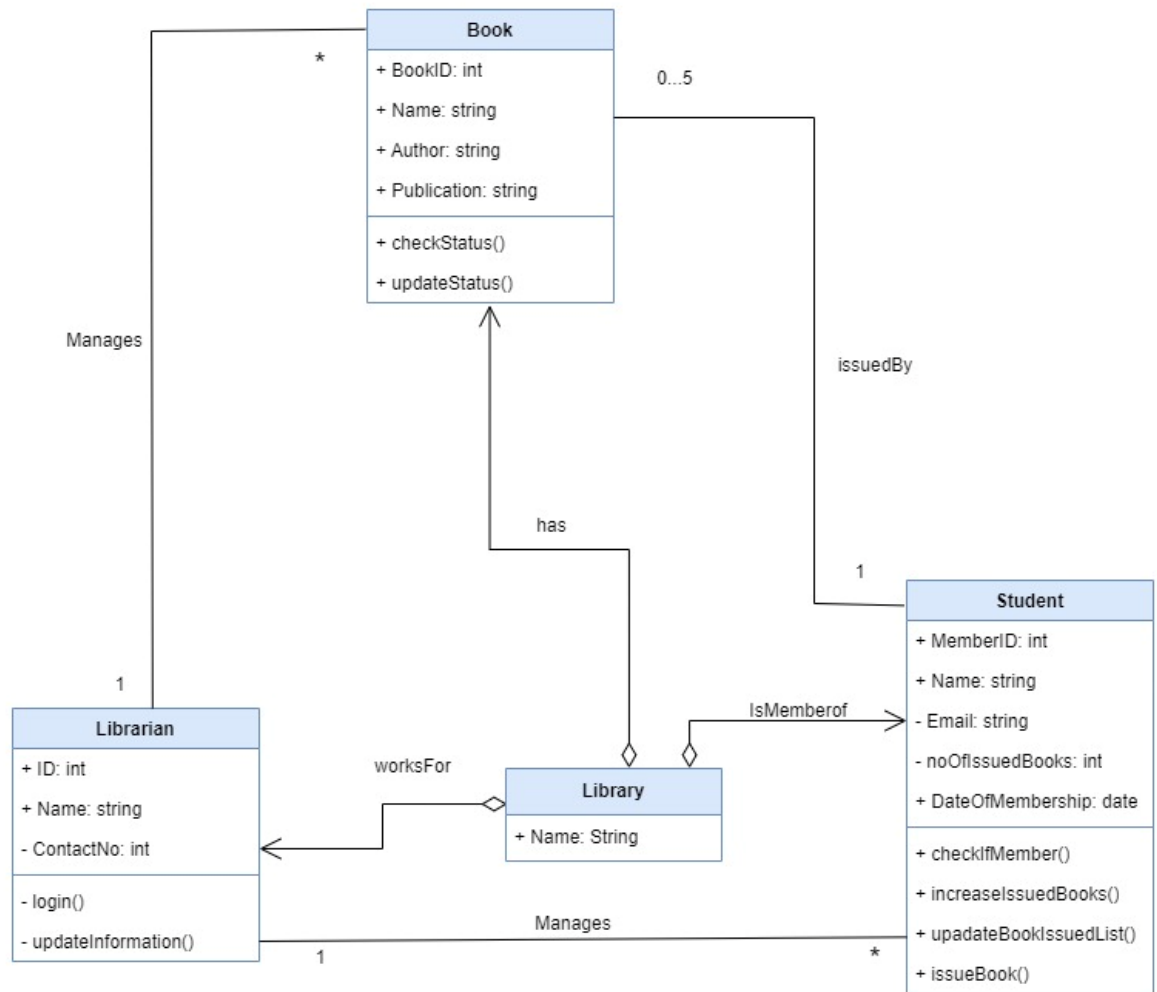


Blue color – Entity

Green color – Boundary objects

Red color – Control objects

3. Draw the analysis object diagram for the “issueBook” use case analysis.



**Q.2. To give an exam, an instructor first notifies the students of the exam date and the material to be covered. She then prepares the exam paper (with sample solutions), gets it copied to produce enough copies for the class, and hands it out to students on the designated time and location. The students write their answers to exam questions and hand in their papers to the instructor. The instructor then gives the exam papers to the TAs, along with sample solutions to each question, and gets them to mark it. She then records all marks and returns the papers to the students.**

**Draw a sequence diagram that represents this process. Make sure to show when is each actor participating in the process. Also, show the operation that is carried out during each interaction, and what its arguments are.**

