IT-314 Software Engineering
Lab-7 Report

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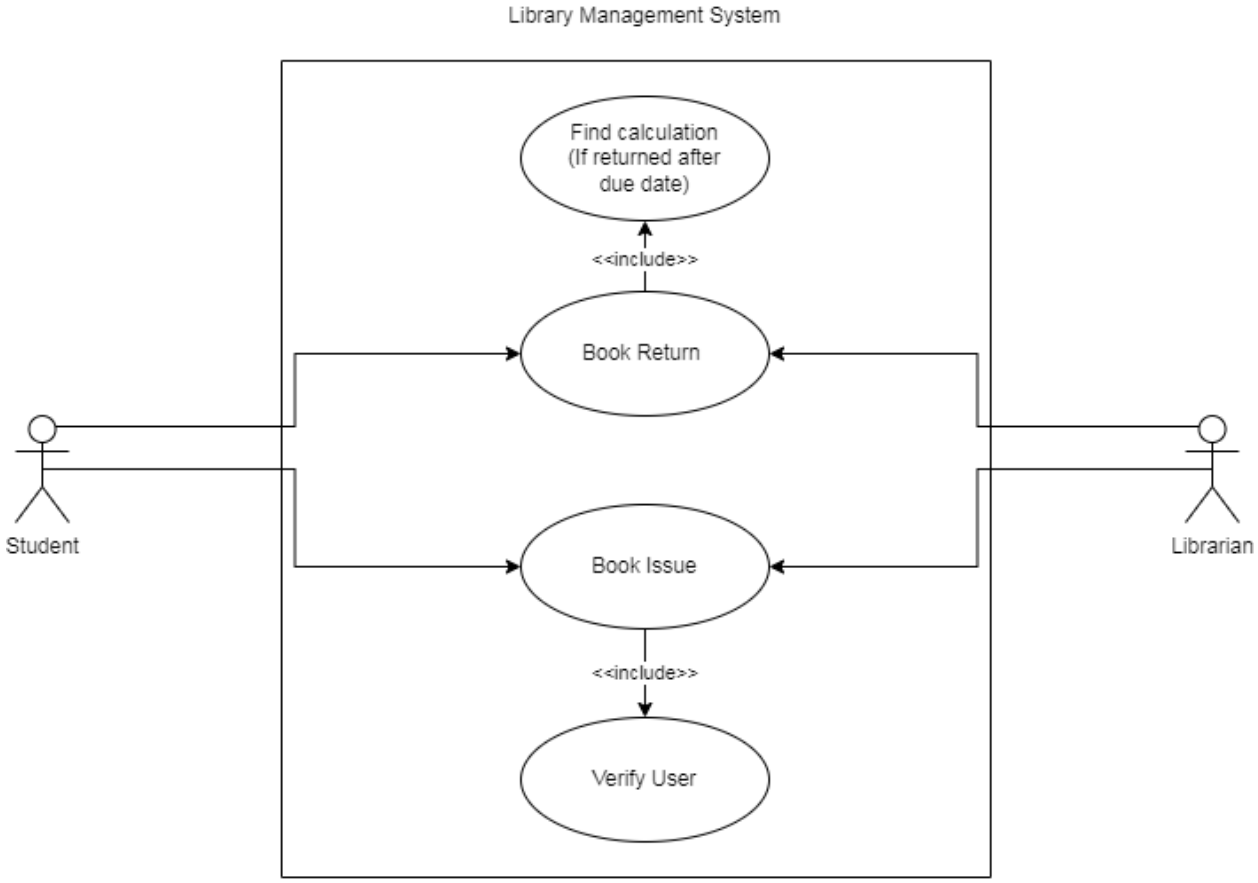
Question 1:

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



Use Case Documentation for Book Issue

Use Case Name: Book Issuance

Primary Actor: Librarian,Student

Other Actors: Database of members,catalogue

- Librarian: Ensures timely book distribution, verifies student enrollment, and keeps complete records of both books and students.

- Student: Wants to issue a book out of the library.

- Prerequisites: The librarian must be verified.

Success:

- The book's catalog status has been changed to "issued."
- The details of the book issue are kept in the student's profile.

Trigger: A student visits the librarian with a book he wants to check out.

Scenario:

- The student goes to the desk of the librarian carrying a book for loan.
- The student's library membership is confirmed by the librarian.
- The book's status is changed by the librarian to "issued."
- After issuing the book, the librarian changes the student's profile.
- The book is given to the student.

Alternative Flow:

- If the system fails in any way:
  1. The system initiates a robust recovery process.
  2. If irregularities in the previous state are found:
     A. the issuing procedure is stopped and restarted.
     B. The librarian can manually update the issuance process.

- If the student asks at any point that the book not be issued:
  1. The book is returned to the library when the issuing transaction is terminated.
  2. The issuing process is terminated and the book is returned to the librarian if the student's membership is invalid.

3. The issuing transaction is canceled and the book is returned to the librarian if the book is already in the possession of another person.

Special Conditions:

- Robust system failure recovery procedures.
- A prompt authorisation answer for processing that is effective.
- Regular system updates to guarantee accurate records.

Post-Conditions: The system goes back to the dashboard and is prepared to handle another transaction for a book issuance or return.

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.)

Entities:

- **Book:** Displays a specific book with an ISBN to determine its availability.
- **Student:** Borrow books from the library using your own student ID.
- **Transaction:**Any contact between a student and a library is represented by a transaction.
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Boundary Object:

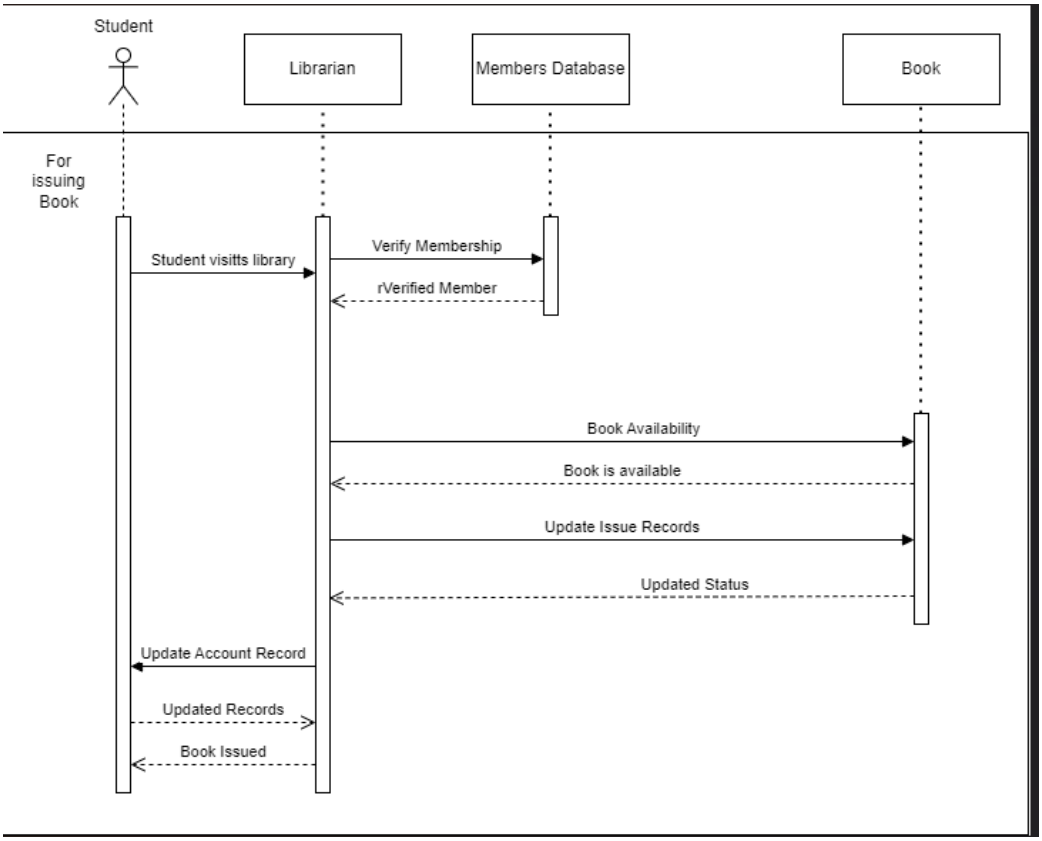
- **Student/Librarian Interface**: The library management system features an interface where transactions would take place and the two parties would communicate.
- **Barcode reader (if available):** This device, which reads barcodes on books, might be regarded as hardware.

Control Objects:

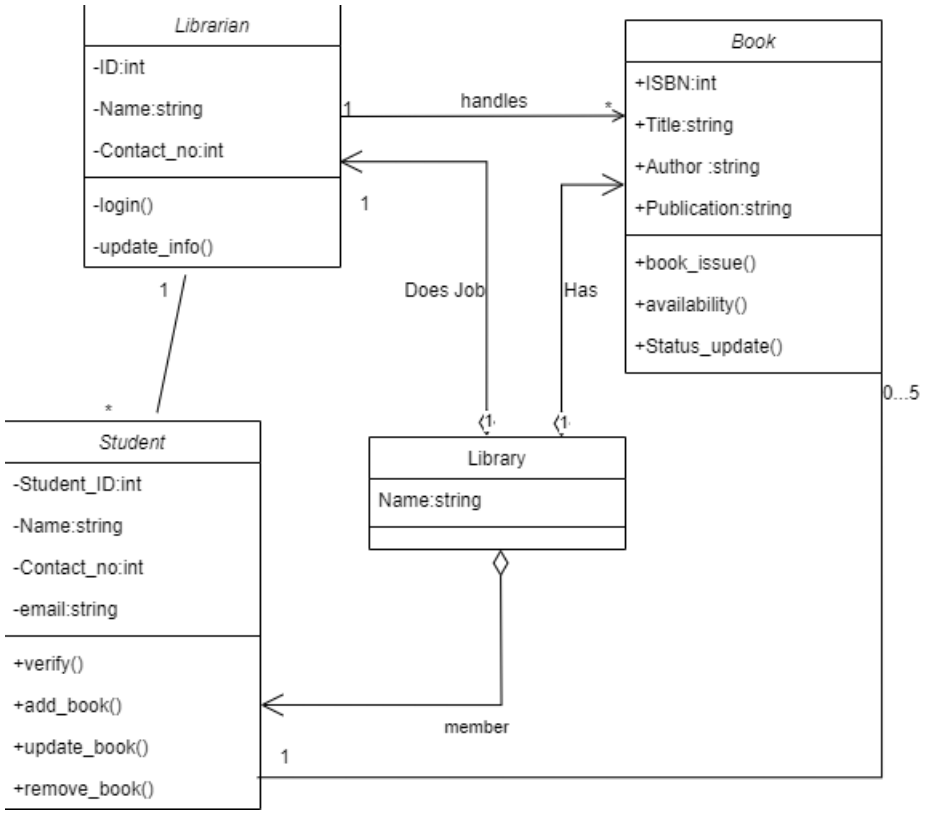
- **Fine Calculator:** Calculates the fine for books that were submitted late.

- **Database system:** Contains student data, verified librarian information, and a collection of book-related data.

- **Library Management System:** Because it organizes and handles every process or transaction, the library management system itself can be regarded as a control object.



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



Question 2:

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.