

## **Lab-7: - Sequence Diagram and Object Diagram**

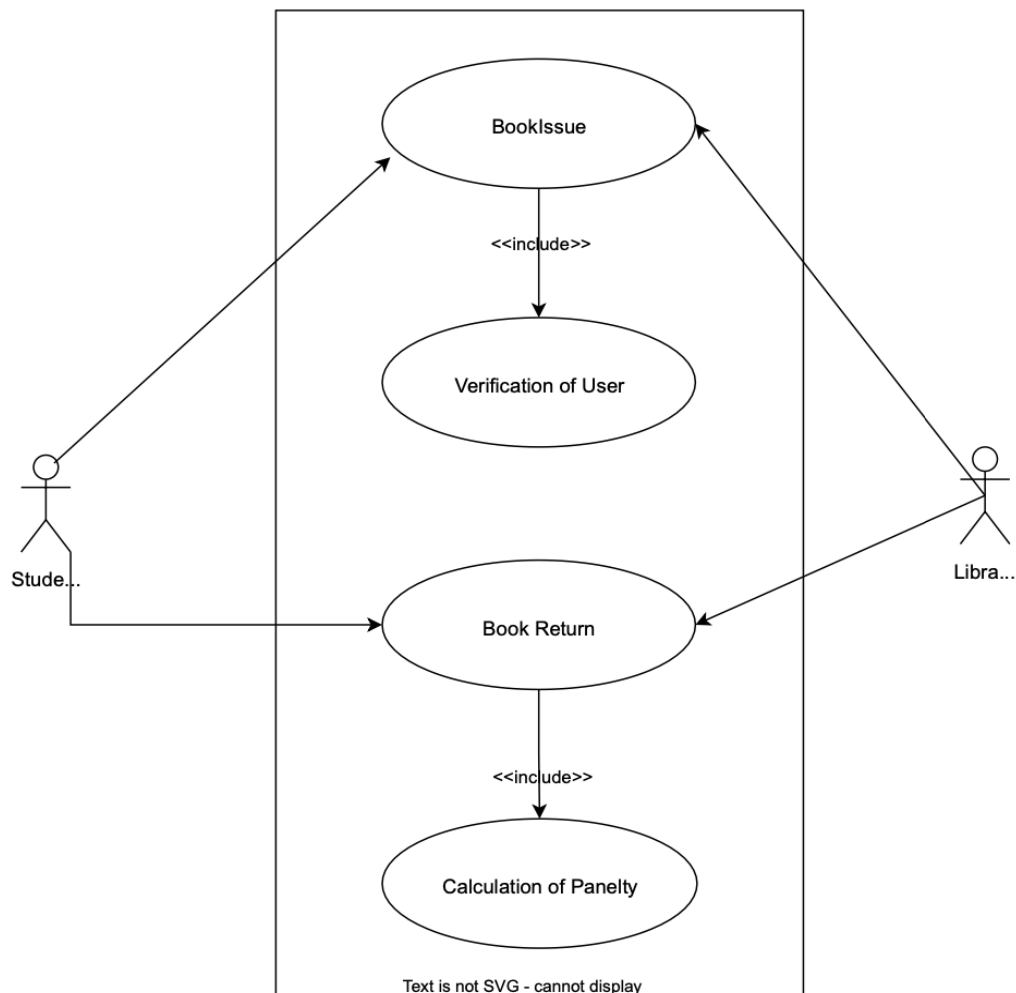
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Lab group- 2

### **Q – 1 Library Management System**

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



- ⊙ Use Case Name: Book Issuance
- ⊙ Primary Actor: Librarian
- ⊙ Other Actors: Student, Database (Book Catalog, Member Records)

❖ Stakeholders and Interests: -

- Librarian: Aims to ensure efficient book issuance, check student membership, and maintain accurate book and student record
- Student: Desires to successfully borrow a book from the library.

❖ Preconditions:

- 1) The librarian must be identified and authenticated.

Main Flow: -

- The book's status in the catalog is updated to "issued."
- The student's profile records the book issuance information. Trigger: A student approaches the librarian with a book to be issued.

● Main Scenario: -

- ❖ The student arrives at the librarian's desk with a book for issuance.
- ❖ The librarian verifies the student's library membership.
- ❖ The librarian updates the book's status to "issued."
- ❖ The librarian updates the student's profile to reflect the book issuance.

❖ The student receives the issued book.

❖ Extensions (Alternative Flow): -

- 1) If the system fails at any point: -
  - I. The system initiates a robust recovery process.
  - II. If anomalies are detected in the prior state,
    - a. The issuance process is canceled and restarted.
    - b. The librarian can manually update the issuance process.
- 2) If the student requests not to issue the book at any time: -
  - I. The issuance transaction is canceled, and the book is returned to the librarian.
  - II. If the student's membership is invalid: The issuance transaction is canceled, and the book is returned to the librarian.
  - III. If the book is currently held by someone else: The issuance transaction is canceled, and the book is returned to the librarian.

The librarian has the option to manually adjust the issuance process.

- In case the student requests not to proceed with the book issuance at any point:

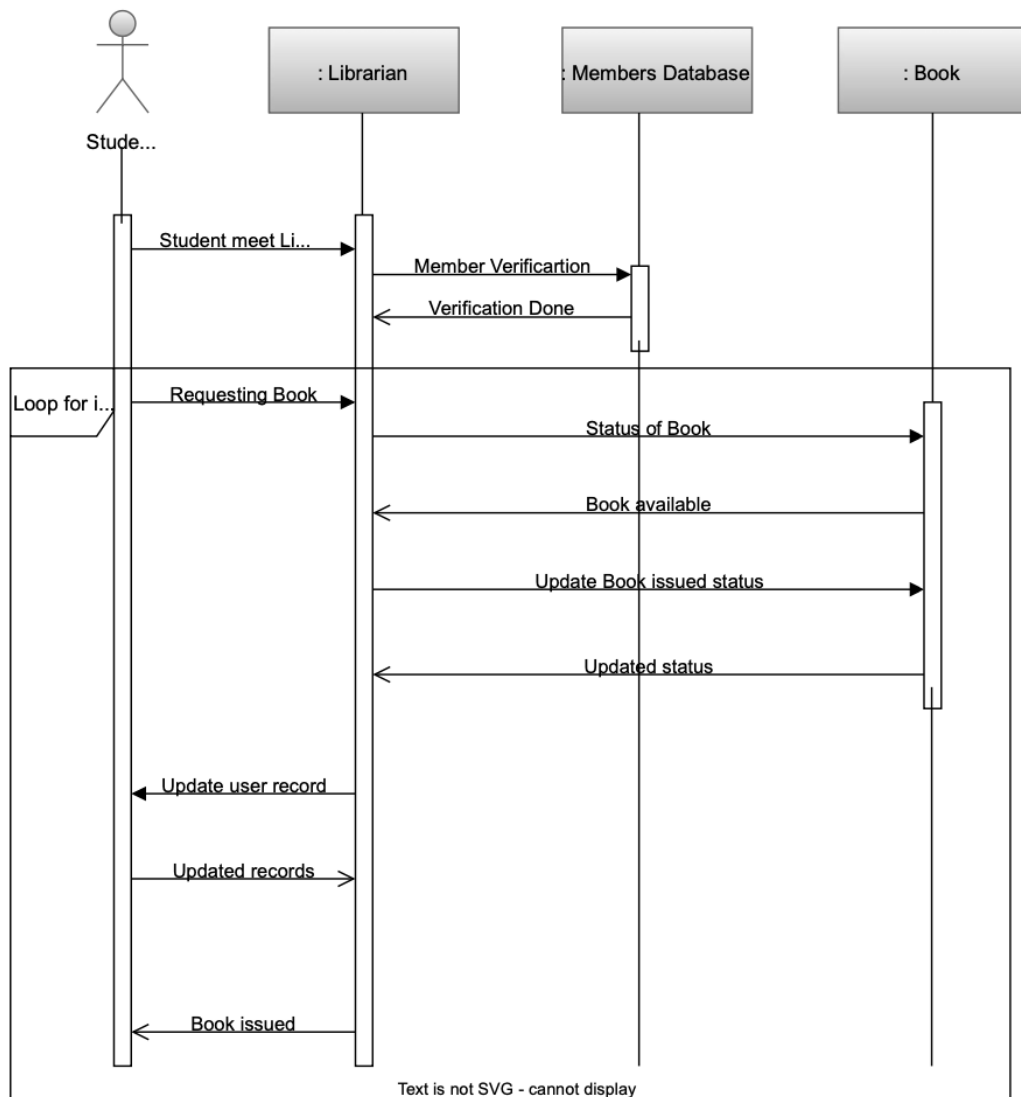
❖ Main Flow: -

- 1) The issuance transaction is canceled, and the book is returned to the librarian.
- 2) If the student's membership is found to be invalid:

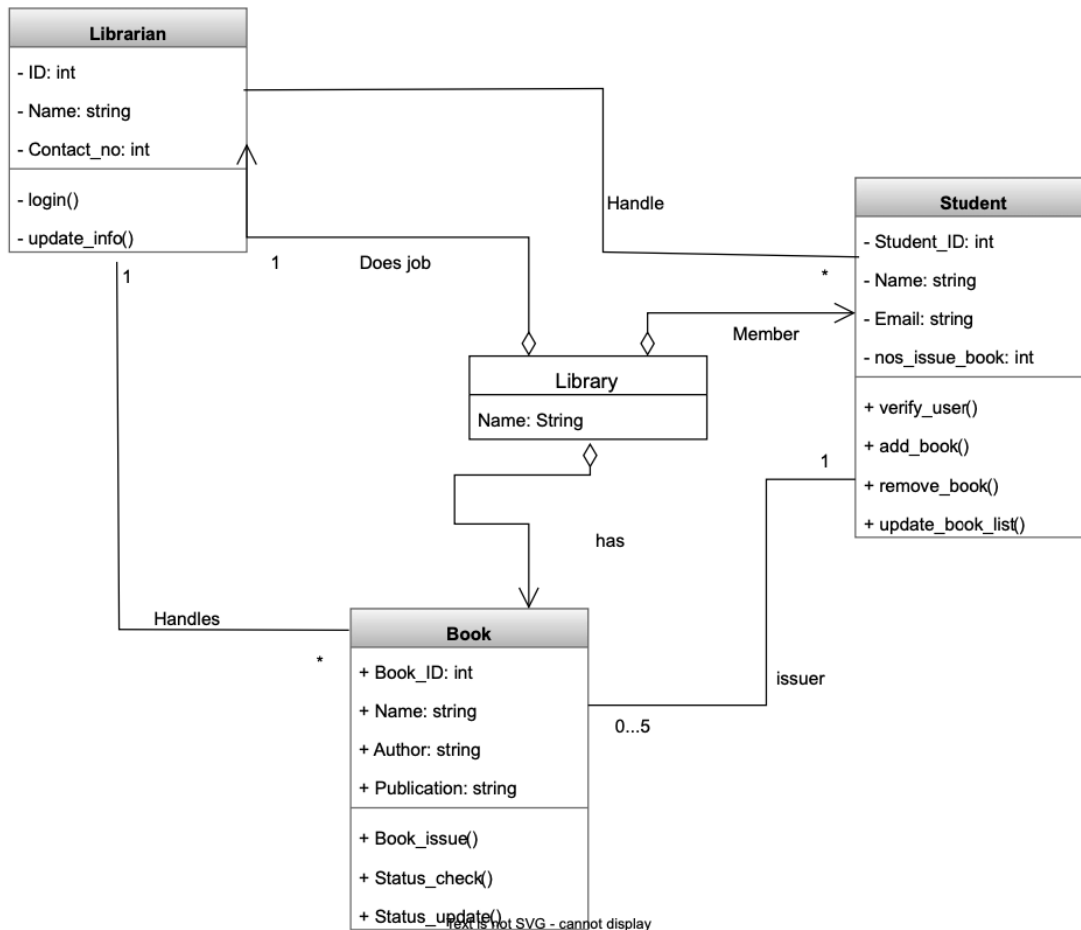
The issuance transaction is canceled, and the book is returned to the librarian.

- 3) If the book is currently checked out by another person: The issuance transaction is canceled, and the book is returned to the librarian.

## **2. The sequence diagram of the “issue book” use case.**



### 3. Draw the analysis object diagram for the “issue book” use case analysis.



Que – 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 each actor is participating in the process. Also, show the operation that is carried out during each interaction, and what its arguments are.

