IT-314 Software Engineering

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Lab Report : 7_Domain Analysis Modeling & Sequence Diagram

Lab Group: 2

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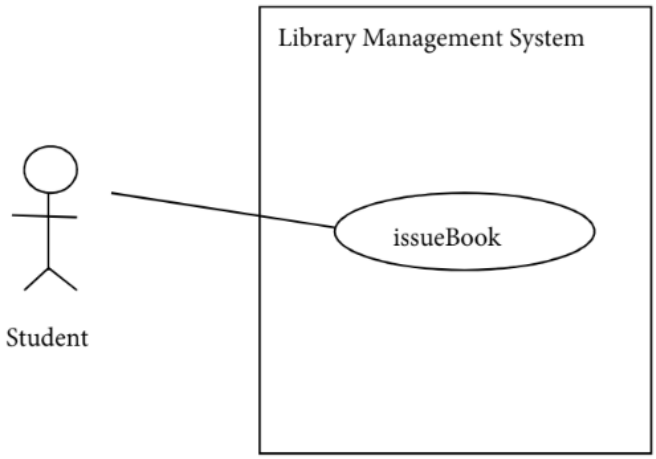
Q.1. Consider the following piece of text

"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.

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.)

3. Draw the analysis object diagram for the "issueBook" use case analysis.

Ans 1.1:

❖ Documenting "IssueBook" Use Case:

- **Use Case Name:** Issuing a Book
- **Description:** This use case outlines the process by which a registered student borrows a book from the library.

- **Primary Actor:** Registered Student
- **Secondary Actors:** Library System and Librarian

- **Preconditions:**

➔ The registered student must log in and be verified by the librarian.
➔ The desired book must be available in the library's collection.

- **Postconditions:**

➔ The book is marked as issued to the student.
➔ A due date for book return is established.
➔ The student receives a notification confirming the successful issuance.

- **Main Flow:**

1) The registered student initiates a book issuance request.
2) The system verifies the student's authentication status.
3) The system checks the availability of the requested book.
4) If the book is available, the system records it as issued to the student.
5) The system sets a due date for the book's return.
6) Notifications are sent to both the student and the librarian to confirm the successful issuance.

- **Alternate Flows:**

➔ If the requested book is unavailable, the system notifies the student that it cannot be issued at the moment.
➔ In case the user's authentication fails, the system informs the librarian of the issue.

Use Case Diagram for IssueBook
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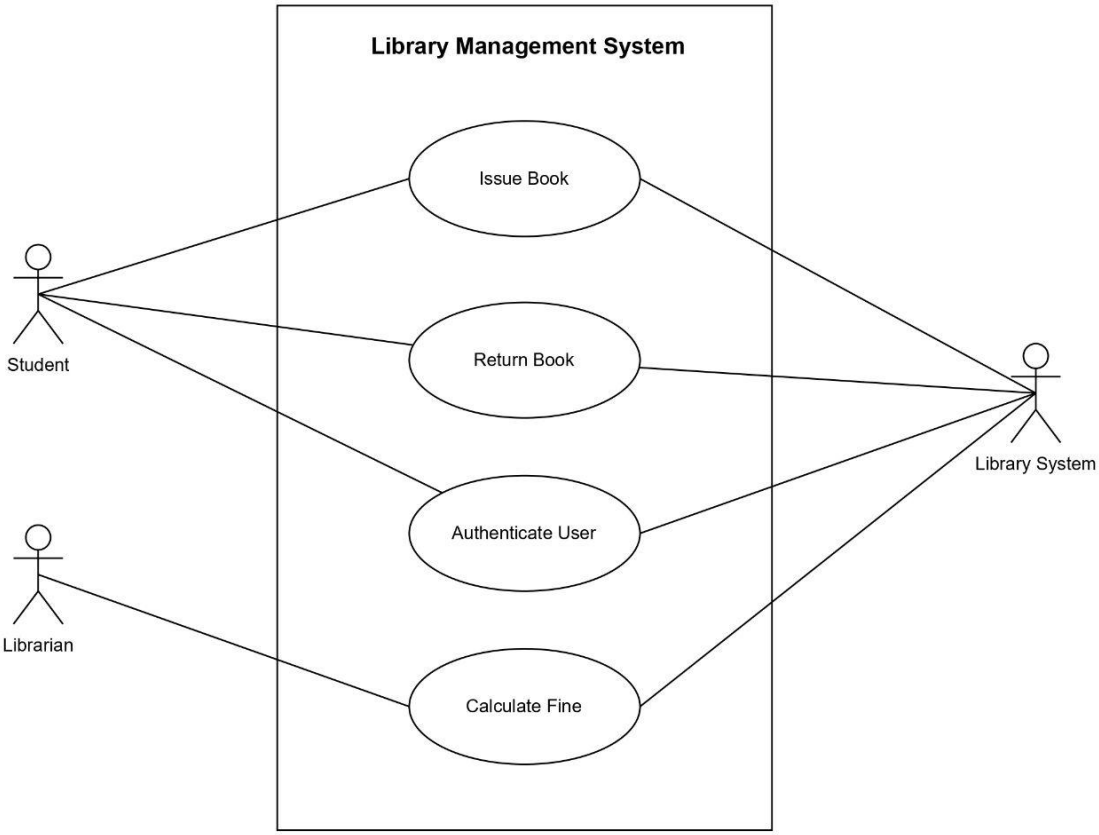
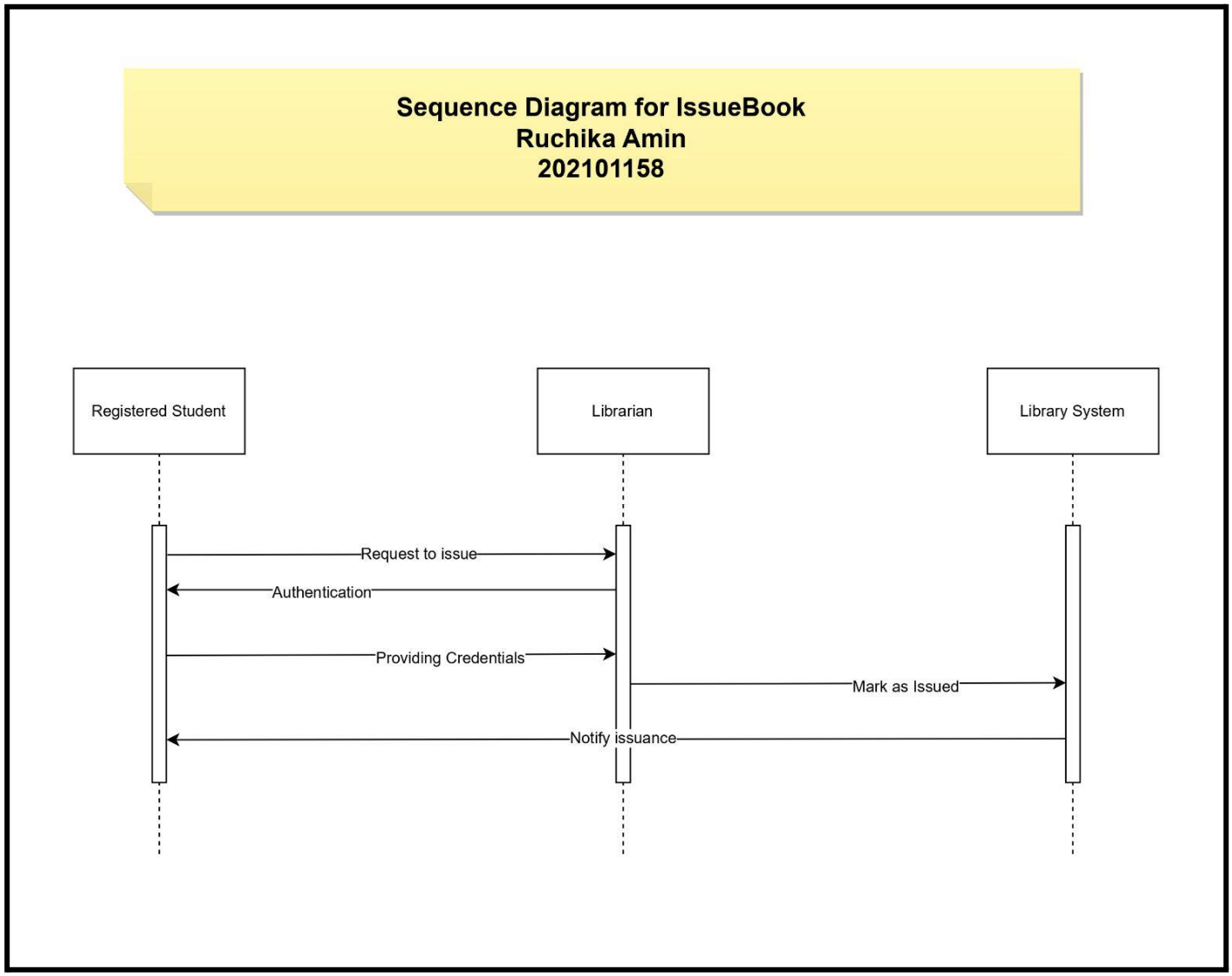


Ans 1.2:



Entity Object :

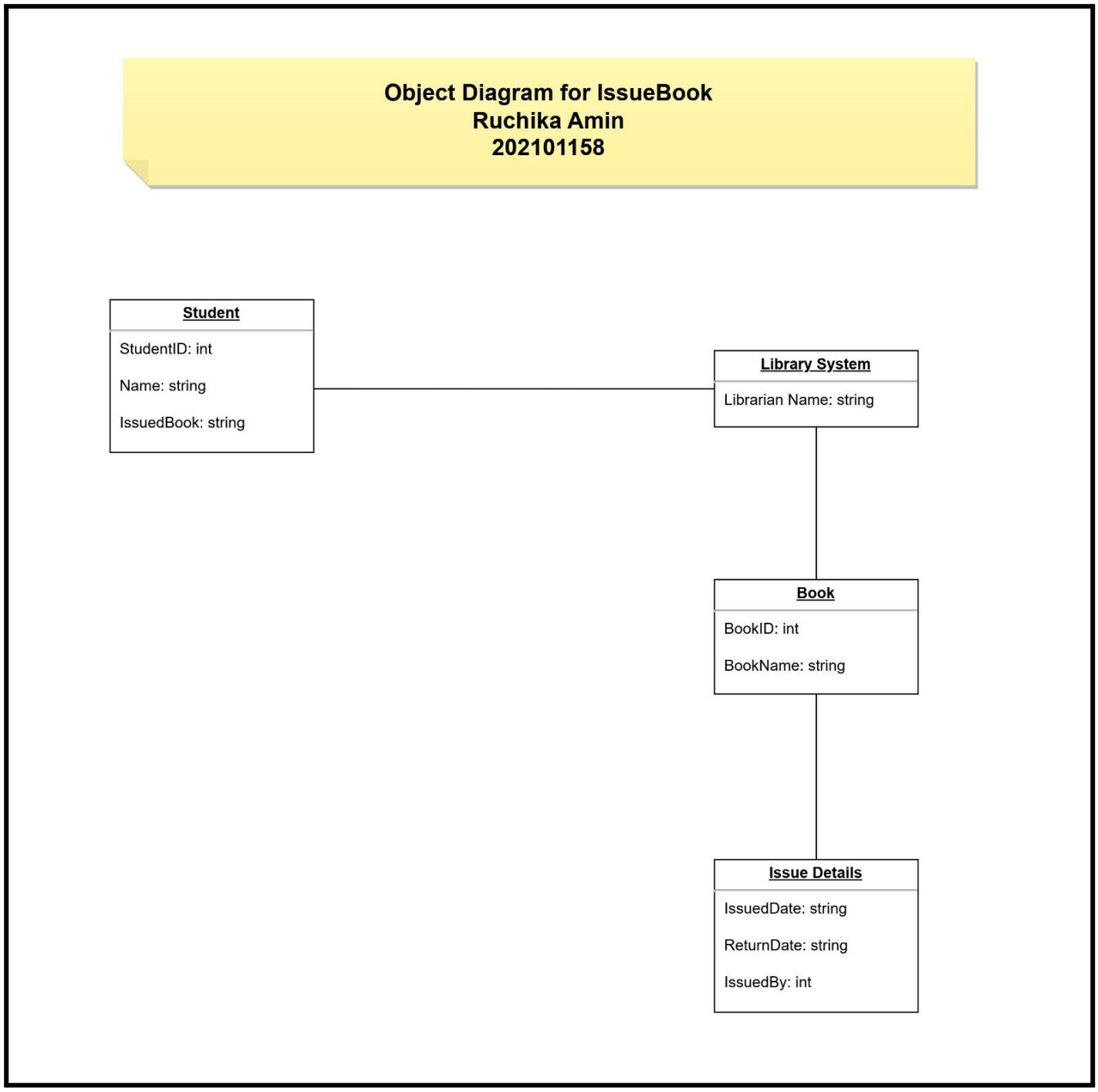
- **RegisteredStudent:** Represents a registered student in the library. It contains data like the student's name, ID, and a list of borrowed books.

Boundary Object:

- **Librarian**: Represents the librarian who is responsible for managing book issuance and return requests. The Librarian acts as a boundary object because they interact directly with users and the library system.

- **Library System**: The "Library System" acts as a boundary object because it represents the external interface through which Librarians and Registered Students communicate with the system.

Ans 1.3:


Object Diagram for IssueBook
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Student
StudentID: int
Name: string
IssuedBook: string
Library System
Librarian Name: string
Book
BookID: int
BookName: string
Issue Details
IssuedDate: string
ReturnDate: string
IssuedBy: int

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.

Que2: Sequence Diagram
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