IT314 - Software Engineering
Lab 7

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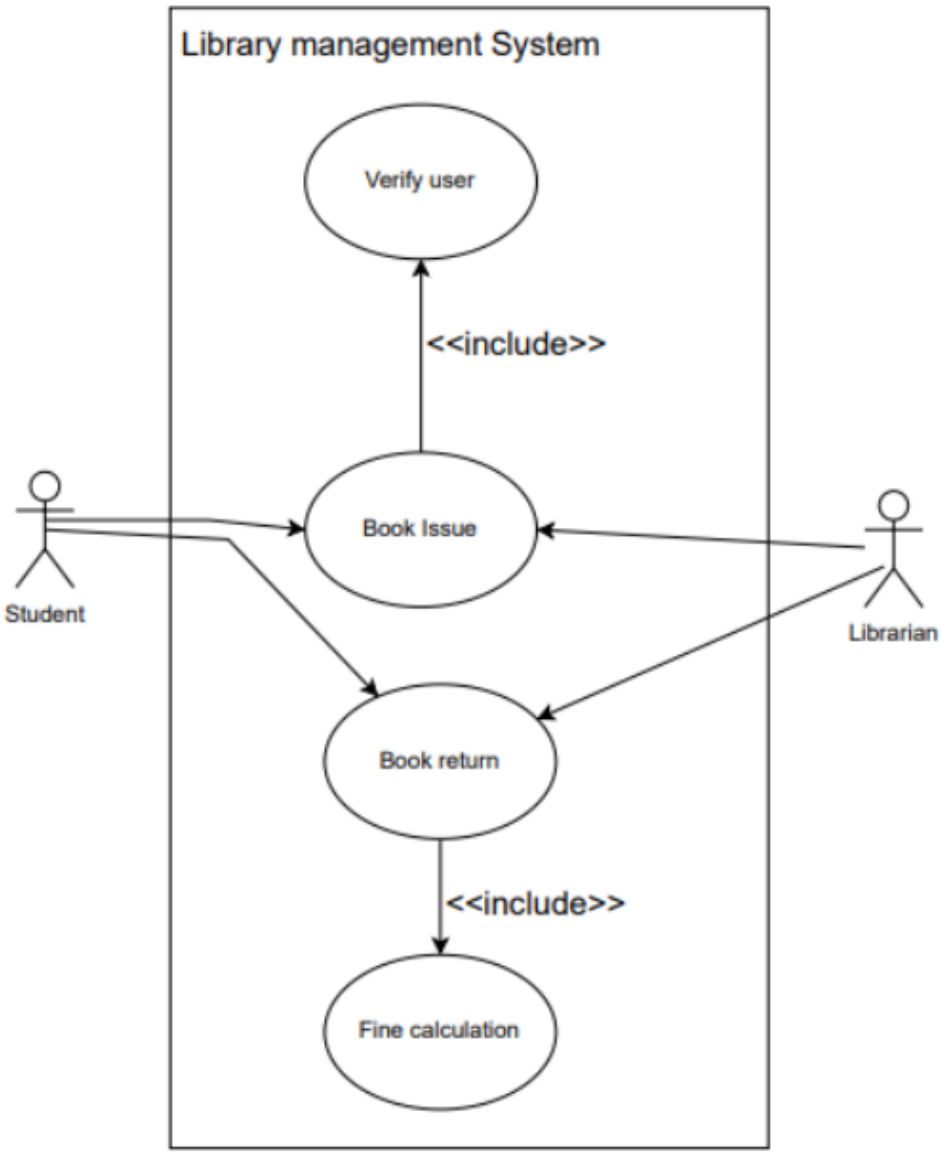
Question 1:

i)



Use Case Documentation: Issue Book

Use Case Name: Book Issuance

Primary Actor: Librarian

Other Actors: Student, Database

- Librarian: Works on efficient book issuance, and maintains an accurate record of students as well as books.
- Student: Wants to successfully issue a book

Preconditions: Librarian (Staff) must be authorized and authenticated.

Goals:

- The Book's status is updated correctly in the database
- The student's profile is also correctly updated.

Trigger: Student meets the staff for the book to be issued

Main Scenario:

1. The student arrives at the issuing counter (Librarian) with a book to issue.
2. The librarian checks the student's library card.
3. The librarian updates the book's status to "Currently Issued".
4. The librarian updates the student's profile to show the book issuance.
5. The student receives the issued book.

Extensions:

1. If the system fails at any point:
    - The system initiates a robust recovery process.
    - If problems are detected in the previous 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
    - The issuance transaction is canceled, and the book is added to the library.
    - If the student's membership is invalid: The issuance transaction is canceled, and the book is added to the library.

- If the book is currently held by someone else: The issuance transaction is canceled, and the book is added to the library.

Special Requirements:

- Robust recovery mechanisms to handle system failures.
- Swift authorization response for efficient processing.
- Timely updates to the system to ensure accurate records

PostConditions:

The system returns to the home state ready for another book to be issued.

ii)

Entities:

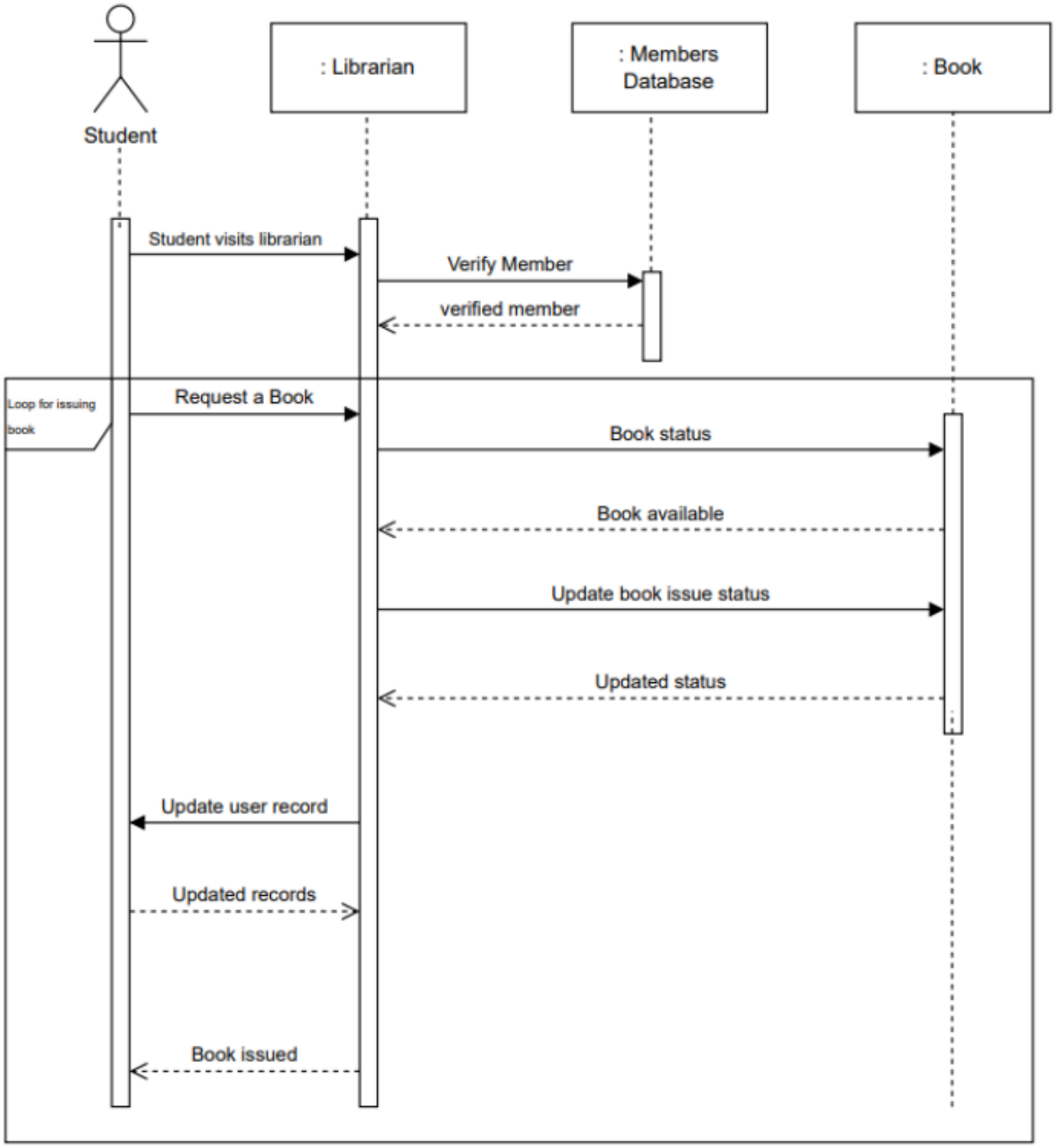
- Book: Represents individual books with unique ID to check availability.
- Student: Student with unique student ID to borrow books from library.
- Transaction: Represents any interaction between student and library.

Boundary Objects:

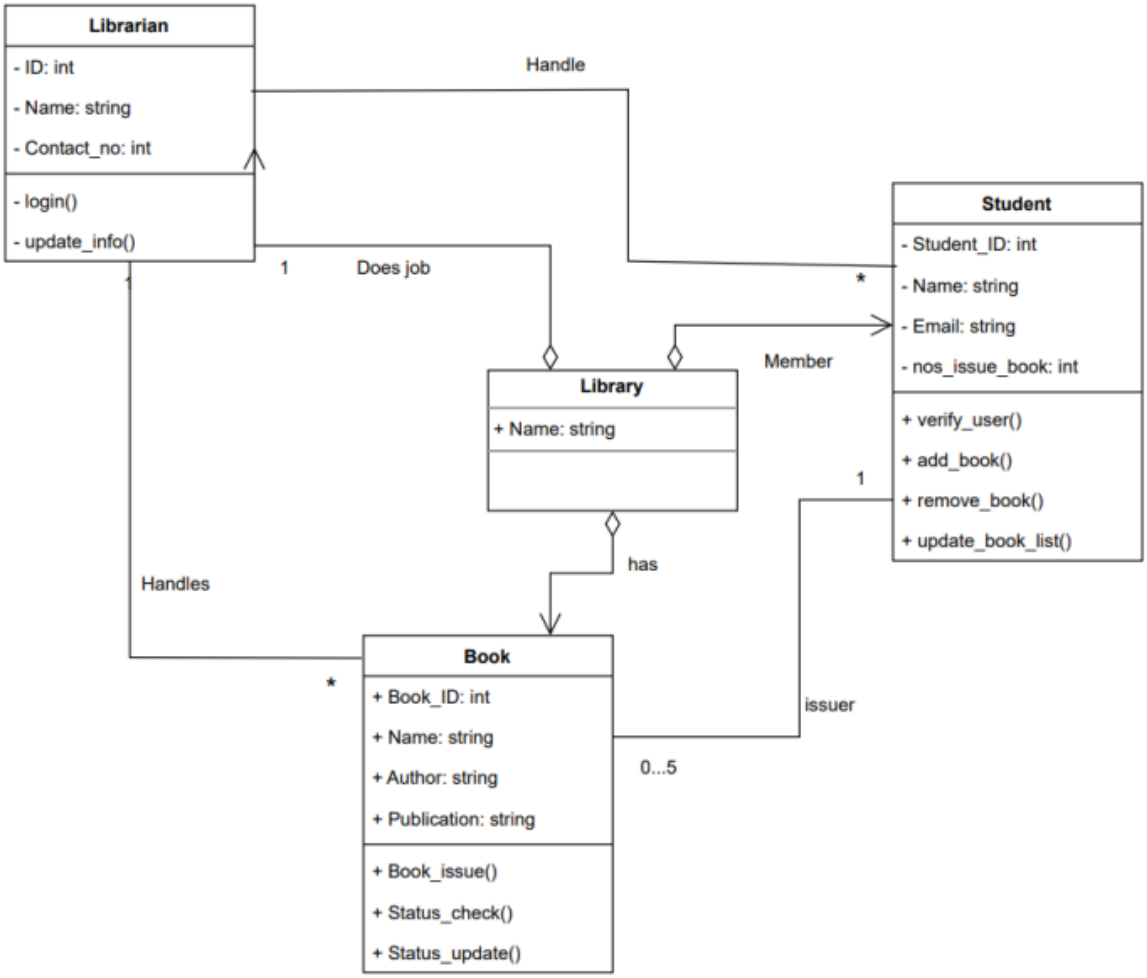
- Main Screen Interface: The library management system has the interface where the transaction would happen and both the actors interact.

Control Objects:

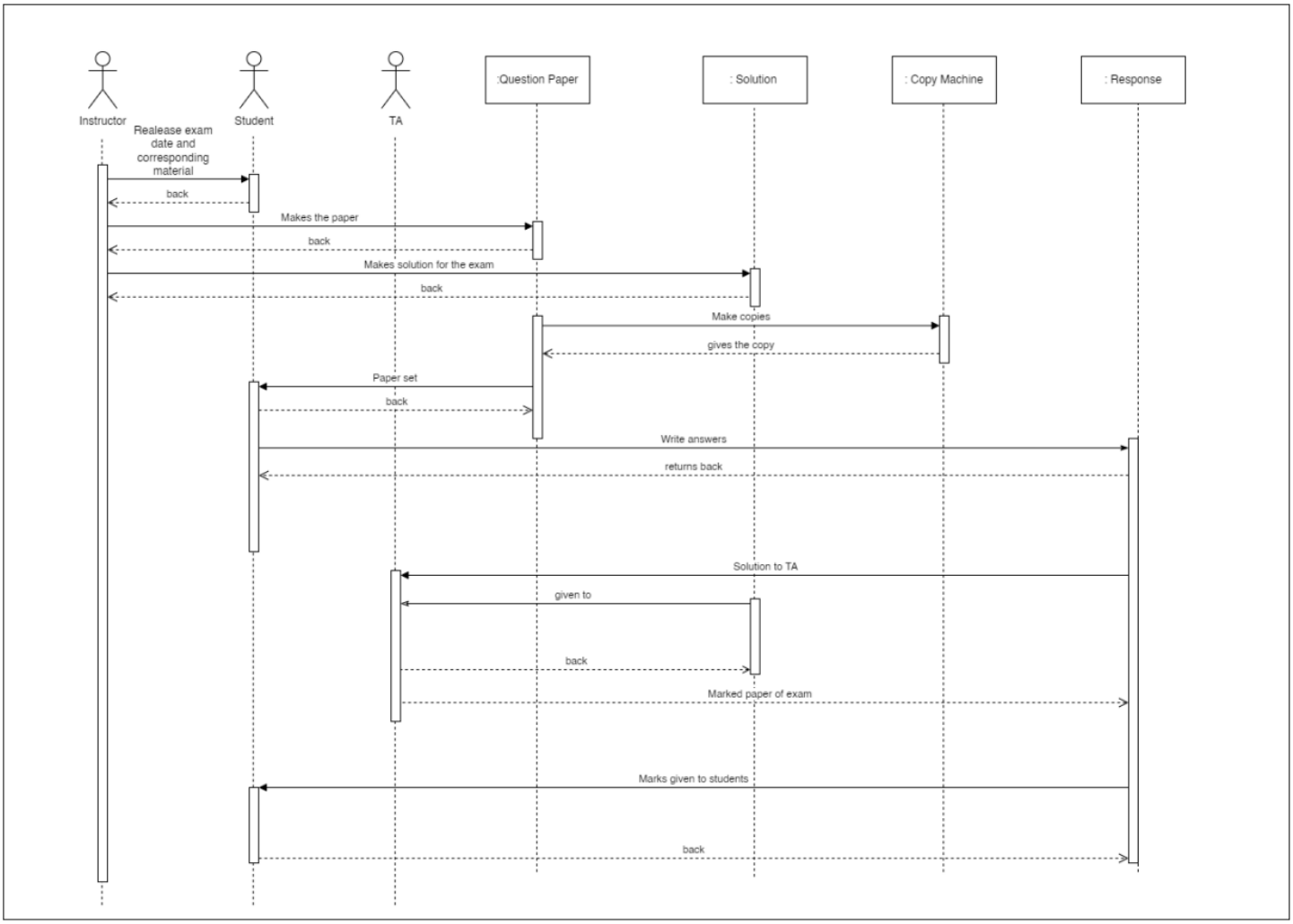
- Fine Calculator: Calculates fine for delayed submission and damage to books.
- Database System: Containing the collection of books and students verified by the librarian (staff).


Student
: Librarian
: Members Database
: Book
Student visits librarian
Verify Member
verified member
Loop for issuing book
Request a Book
Book status
Book available
Update book issue status
Updated status
Update user record
Updated records
Book issued

iii)


Librarian
- ID: int
- Name: string
- Contact_no: int
- login()
- update_info()
Handle
Student
- Student_ID: int
- Name: string
- Email: string
- nos_issue_book: int
+ verify_user()
+ add_book()
+ remove_book()
+ update_book_list()
1
Does job
*
Member
Library
+ Name: string
1
has
Handles
*
Book
+ Book_ID: int
+ Name: string
+ Author: string
+ Publication: string
+ Book_issue()
+ Status_check()
+ Status_update()
issuer
0...5

Question 2:


Instructor
Student
TA
:Question Paper
: Solution
: Copy Machine
: Response
Realease exam date and corresponding material
back
Makes the paper
back
Makes solution for the exam
back
Make copies
gives the copy
Paper set
back
Write answers
returns back
Solution to TA
given to
back
Marked paper of exam
Marks given to students
back