

Project Report

Bits Library Management System

CS F212- Database Systems

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Group Members:

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Problem Description

Need for a Better Library System

In today's rapidly evolving digital landscape, traditional library systems often face significant challenges in meeting the diverse needs of users efficiently. The following issues underscore the pressing need for a more robust and sophisticated library system:

- **Inefficient Book Management:** Conventional library systems rely on manual processes for book management, including cataloging, tracking, and issuing. These methods are time-consuming, error-prone, and often result in inconsistencies in book availability and inventory management.
- **Limited Accessibility and Convenience:** Traditional library systems may restrict access to physical library premises,

limiting user convenience, especially for those with mobility challenges or those residing in remote areas.

- **Lack of Real-time Information:** Many existing library systems struggle to provide real-time information on book availability, due dates, and reservation status. This lack of up-to-date information can lead to user frustration and dissatisfaction, as users may not be able to plan their library visits or access desired resources promptly.
- **Ineffective User Engagement:** Traditional library systems often lack features to engage users effectively, such as personalized recommendations, interactive interfaces, and community-driven content curation. This limitation hampers user engagement and may result in decreased usage of library resources over time.

The primary objective of this project is to design and implement a robust library management application that facilitates book borrowing and returning for users, alongside providing librarians with the necessary tools to efficiently manage user accounts.

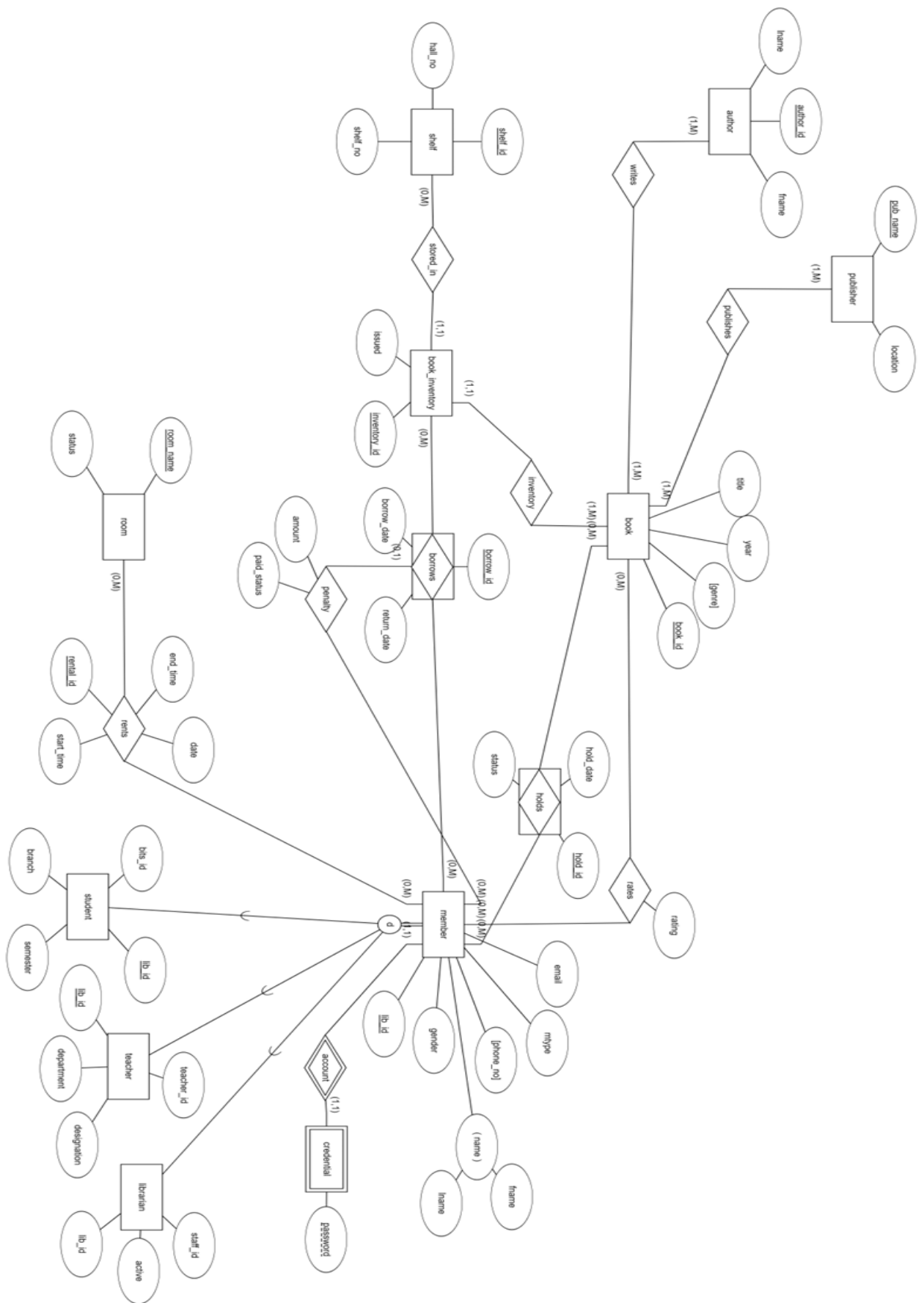
This app integrates multiple features aimed at enhancing the overall library experience for its users. These features encompass functionalities such as intuitive book search capabilities, user-friendly borrowing and returning processes, personalized account management options, and comprehensive librarian tools for overseeing user activities and book inventory. By combining these features, the app aims to emulate the traditional library experience while leveraging the convenience and accessibility of modern technology.

1.1 Requirement/Feature

- 1) User Login
- 2) Book Issue/Hold
- 3) Resource Management
- 4) User Management
- 5) Catalogue Management
- 6) Rating System
- 7) Track Borrowing History

- User Login - Enables users to access library accounts, to access library services.
- Book Issue/Hold - Enables users to borrow available books and place hold on unavailable ones and ensuring priority access upon availability.
- User Management – Allows librarians to create, edit, and manage user accounts, including registration details.
- Catalogue Management - Enables librarians to keep the library catalogue up-to-date by adding, editing, or removing book entries, ensuring reliable information for users.
- Rating System - Allows users to provide ratings on books, enhancing the book selection process for other users.
- Track Borrowing History - Provides users with a detailed view of their borrowing history, including their current penalty, due dates, and renewals, aiding in the management of borrowed items.

1.2 E-R Model



1.4 Relational Model

- **member** (lib_id, fname, lname, gender, email, mtype, status)

fd1: lib_id → fname, lname, gender, email, mtype, status

- **student** (lib_id, bits_id, branch, semester)

fd1: bits_id → branch, semester

fd2: lib_id → bits_id, branch, semester

foreign key: lib_id references member (lib_id)

this establishes the relationship between each student and their member record.

candidate key: bits_id

bits_id can also uniquely identify student tuples

- **teacher** (lib_id, teacher_id, designation, department)

fd1: teacher_id → designation, department

fd2: lib_id → teacher_id, designation, department

foreign key: lib_id references member (lib_id)

links teacher records to their corresponding member entry.

candidate key: teacher_id

teacher_id can also uniquely identify teacher tuples

- **librarian** (lib_id, staff_id, active)

fd1: lib_id → staff_id, active

foreign key: lib_id references member (lib_id)

connects librarian records to the member table.

candidate key: staff_id

staff_id can also uniquely identify staff tuples

- **member_phone** (lib_id, phone_no)

fd1: (lib_id, phone_no) → {}

foreign key: lib_id references member (lib_id)

associates phone numbers with specific members.

- **account** (lib_id, password)

fd1: lib_id → password

foreign key: lib_id references member (lib_id)

connects account login information to a member.

- **book** (book_id, title, year)

fd1: book_id → book_title, year, shelf_id, pub_name, author_id

foreign key 1: shelf_id references shelf (shelf_id)

indicates where the book is located within the library.

- **writes** (book_id, author_id)

foreign key 1: author_id references author (author_id)

connects writes to author

foreign key 2: book_id references book (book_id)

connects writes to book

- **publishes** (pub_name, book_id)

foreign key 1: pub_name references publisher (pub_name)

connects publishes to publisher

foreign key 2: book_id references book (book_id)

connects publishes to book

- **stored_in** (inventory_id, shelf_id)

foreign key 1: inventory_id references inventory (inventory_id)

foreign key 2: shelf_id references shelf (shelf_id)

associates stored_in with inventory and shelf

- **bookgenre** (book_id, genre_name)

fd1: (book_id, genre_name) → {}

foreign key: book_id references books (book_id)

associates books with their genres.

- **shelf** (shelf_id, hall_no, shelf_no)

fd1: shelf_id → hall_no, shelf_no

- **author** (author_id, fname, lname)

fd1: author_id → fname, lname

- **publisher** (pub_name, location) {pub_name->location}

fd1: pub_name → location

- **borrows** (borrow_id, lib_id, inventory_id, borrow_date, return_date)

fd1: borrow_id → lib_id, inventory_id, borrow_date, return_date

foreign key 1: lib_id references member (lib_id)

specifies which member is borrowing an item.

foreign key 2: inventory_id references inventory (inventory_id)

indicates which inventory item is being borrowed.

- **inventory** (inventory_id, book_id, issued)

fd1: inventory_id → book_id, issued

foreign key: book_id references books (book_id)

connects inventory items to specific books.

- **rating** (book_id, lib_id, rating)

fd1: (book_id, lib_id) → rating

foreign key 1: book_id references books (book_id)

foreign key 2: lib_id references member (lib_id)

connects ratings to books and members.

- **room** (room_name, status)

fd1: room_name → status

- **holds** (hold_id, book_id, lib_id, status, hold_date, hold_time)

fd1: hold_id → book_id, lib_id, status, hold_date, hold_time

foreign key 1: book_id references books (book_id)

foreign key 2: lib_id references member (lib_id)

associates hold with books and members.

- **rents** (rental_id, start_time, end_time, date, lib_id, room_name)

fd1: rental_id → start_time, end_time, date, lib_id, room_name

foreign key 1: lib_id references member (lib_id)

foreign key 2: room_name references room (room_name)

- **penalty** (borrow_id, amount, paid_status)

fd1: borrow_id → amount, paid_status

foreign key: borrow_id references borrow (borrow_id)

1.5 Technical Details:

- **Table Snapshots**

```
CREATE TABLE member (  
    lib_id INT PRIMARY KEY auto_increment,  
    fname VARCHAR(50),  
    lname VARCHAR(50),  
    gender CHAR(1),  
    email VARCHAR(100),  
    mtype VARCHAR(20),  
    status VARCHAR(10)  
);
```

```
CREATE TABLE student (  
    lib_id INT PRIMARY KEY ,  
    bits_id varchar(13) UNIQUE,  
    branch VARCHAR(50),  
    semester INT,  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE teacher (  
    lib_id INT PRIMARY KEY ,  
    teacher_id varchar(13) UNIQUE,  
    designation VARCHAR(50),  
    department VARCHAR(50),  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE librarian (  
    lib_id INT PRIMARY KEY,  
    staff_id varchar(13) unique,  
    active BOOLEAN,  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE member_phone (  
    lib_id INT,  
    phone_no numeric(10,0),  
    PRIMARY KEY (lib_id, phone_no),  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE account (  
    lib_id INT PRIMARY KEY,  
    password VARCHAR(100),  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE shelf (  
    shelf_id INT PRIMARY KEY auto_increment,  
    hall_no INT,  
    shelf_no INT,  
    UNIQUE(hall_no,shelf_no)  
);
```

```
CREATE TABLE book (  
    book_id INT PRIMARY KEY auto_increment,  
    title VARCHAR(100),  
    year INT  
  
);
```

```
CREATE TABLE author (  
    author_id INT PRIMARY KEY auto_increment,  
    fname VARCHAR(50),  
    lname VARCHAR(50)  
);
```

```
CREATE TABLE publisher (  
    pub_name VARCHAR(50) PRIMARY KEY,  
    location VARCHAR(100)  
);
```

```
CREATE TABLE writes (  
    book_id INT,  
    author_id INT,  
    PRIMARY KEY (book_id, author_id),  
    FOREIGN KEY (author_id) REFERENCES author(author_id),  
    FOREIGN KEY (book_id) REFERENCES book(book_id)  
);
```

```
CREATE TABLE publishes (  
    pub_name VARCHAR(50),  
    book_id INT,  
    PRIMARY KEY (pub_name, book_id),  
    FOREIGN KEY (pub_name) REFERENCES publisher(pub_name),  
    FOREIGN KEY (book_id) REFERENCES book(book_id)  
);
```

```
CREATE TABLE inventory (  
    inventory_id INT PRIMARY KEY auto_increment,  
    book_id INT,  
    issued BOOLEAN,  
    FOREIGN KEY (book_id) REFERENCES book(book_id)  
);
```

```
CREATE TABLE stored_in (  
    inventory_id INT,  
    shelf_id INT,  
    PRIMARY KEY (inventory_id, shelf_id),  
    FOREIGN KEY (inventory_id) REFERENCES inventory(inventory_id),  
    FOREIGN KEY (shelf_id) REFERENCES shelf(shelf_id)  
);
```

```
CREATE TABLE bookgenre (  
    book_id INT,  
    genre_name VARCHAR(50),  
    PRIMARY KEY (book_id, genre_name),  
    FOREIGN KEY (book_id) REFERENCES book(book_id)  
);
```

```
CREATE TABLE borrows (  
    borrow_id INT PRIMARY KEY auto_increment,  
    lib_id INT,  
    inventory_id INT,  
    borrow_date DATE,  
    return_date DATE,  
    approvereturn VARCHAR(20),  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id),  
    FOREIGN KEY (inventory_id) REFERENCES inventory(inventory_id)  
);
```

```
CREATE TABLE rating (  
    book_id INT,  
    lib_id INT,  
    rating INT,  
    PRIMARY KEY (book_id, lib_id),  
    FOREIGN KEY (book_id) REFERENCES book(book_id),  
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)  
);
```

```
CREATE TABLE holds (
    hold_id INT PRIMARY KEY auto_increment,
    book_id INT,
    lib_id INT,
    status VARCHAR(20),
    hold_date DATE,
    hold_time TIME,
    FOREIGN KEY (book_id) REFERENCES book(book_id),
    FOREIGN KEY (lib_id) REFERENCES member(lib_id)
);
```

```
CREATE TABLE penalty (
    borrow_id INT PRIMARY KEY,
    amount DECIMAL(10,2),
    paid_status VARCHAR(10),
    FOREIGN KEY (borrow_id) REFERENCES borrows(borrow_id)
);
```

154 • `select * from member;`

Result Grid							
		Filter Rows:		Edit:		Export/Import:	
	lib_id	fname	lname	gender	email	mtype	status
▶	1	John	Doe	M	john.doe@example.com	Student	Unlocked
	2	Jane	Doe	F	jane.doe@example.com	Teacher	Unlocked
	3	Alice	Smith	F	alice.smith@example.com	Librarian	Unlocked
	4	Bob	Johnson	M	bob.johnson@example.com	Student	Unlocked
	5	Emily	Williams	F	emily.williams@example.com	Teacher	Unlocked
	6	Michael	Brown	M	michael.brown@example.com	Librarian	Unlocked
	7	Sarah	Jones	F	sarah.jones@example.com	Student	Unlocked
	8	David	Martinez	M	david.martinez@example.com	Teacher	Unlocked
	9	Jessica	Garcia	F	jessica.garcia@example.com	Librarian	Unlocked
	10	James	Hernandez	M	james.hernandez@example.com	Student	Unlocked
	11	A	M	M	a@a.com	Student	Unlocked
	12	Pratyush	Pratyush	M	b@b.com	Librarian	Unlocked

	book_id	title	year
▶	1	Introduction to Algorithms	2009
	2	Database Management Systems	2018
	3	Artificial Intelligence: A Modern Approach	2020
	4	Operating System Concepts	2016
	5	Computer Networks	2019
	6	Discrete Mathematics and Its Applications	2017
	7	Digital Electronics	2015
	8	Principles of Compiler Design	2021
	9	Data Structures and Algorithms in Python	2020
	10	Computer Organization and Design	2018
	11	Intel Microprocessors	2024
•	NULL	NULL	NULL

	author_id	fname	lname
▶	1	Thomas	Cormen
	2	Abraham	Silberschatz
	3	Stuart	Russell
	4	Andrew	Tanenbaum
	5	Kenneth	Rosen
	6	Floyd	Thomas
	7	Alfred	Aho
	8	Michael	T. Goodrich
	9	David	Patterson
	10	Barry	Brey
•	NULL	NULL	NULL

	pub_name	location
▶	Elsevier	Amsterdam, Netherlands
	McGraw-Hill	New York, USA
	MIT Press	Cambridge, Massachusetts
	Morgan Kaufmann	San Francisco, USA
	Oxford Press	London, UK
	Pearson	New York, USA
	Prentice Hall	Upper Saddle River, New Jersey
	Puffin	Sydney, Australia
	W. W. Norton & Company	New York, USA
	Wiley	Hoboken, New Jersey
•	NULL	NULL

	borrow_id	lib_id	inventory_id	borrow_date	return_date	approvereturn
▶	1	11	1	2024-04-17	2024-04-17	Approved
	2	11	7	2024-03-17	2024-04-17	Approved
	3	11	3	2024-04-17	2024-04-17	Approved
	4	1	3	2024-04-17	NULL	NULL
	5	11	1	2024-04-17	NULL	NULL
*	NULL	NULL	NULL	NULL	NULL	NULL

	hold_id	book_id	lib_id	status	hold_date	hold_time
▶	1	2	1	Approved	2024-04-17	22:04:19
*	NULL	NULL	NULL	NULL	NULL	NULL

	inventory_id	book_id	issued
▶	1	1	1
	2	1	0
	3	2	1
	4	3	0
	5	3	0
	6	4	0
	7	5	0
	8	5	0
	9	6	0
	10	6	0
	11	6	0
	12	7	0

	book_id	genre_name
▶	1	Computer Science
	2	Computer Science
	3	Computer Science
	4	Computer Science
	5	Computer Science
	6	Mathematics
	7	Electronics
	8	Computer Science
	9	Computer Science
	10	Computer Science
	11	Electronics
*	NULL	NULL

	book_id	lib_id	rating
▶	1	11	4
✱	NULL	NULL	NULL

	borrow_id	amount	paid_status
▶	2	55.00	Paid
✱	NULL	NULL	NULL

- Screen Shots (create, update, delete, insert)

```
CREATE PROCEDURE addLibrarian(
BEGIN
    Declare user_id int;
    DECLARE staff_id_exists int;
    declare p_lib_id int;
-- Check if the email already exists
SELECT lib_id INTO user_id
FROM member
WHERE email = p_email;

    SELECT COUNT(*) INTO staff_id_exists
FROM student
WHERE staff_id = p_staff_id;
IF staff_id_exists > 0 THEN
    SET out_status = 1; -- 'Staff ID already exists';
ELSEIF user_id IS NULL THEN
    -- Register a new librarian
    CALL addMember(@p_lib_id, p_fname, p_lname, p_gender, p_email, 'Librarian', p_phone_no, p_password);
    INSERT INTO librarian(lib_id, staff_id, active)
    VALUES (@p_lib_id, p_staff_id, p_active);
    SET out_status = 0; -- 'Librarian registered successfully';
ELSE
    SET out_status = 2; -- 'Email already exists';
END IF;
END//

CREATE PROCEDURE addStudent(
BEGIN
    DECLARE user_id INT;
    DECLARE bits_id_exists INT;

    -- Check if the email already exists
    SELECT lib_id INTO user_id
    FROM member
    WHERE email = p_email;

    -- Check if bits_id already exists
    SELECT COUNT(*) INTO bits_id_exists
    FROM student
    WHERE bits_id = p_bits_id;

    IF bits_id_exists > 0 THEN
        SET out_status = 1; -- 'BITS ID already exists';
    ELSEIF user_id IS NULL THEN
        -- Register a new student
        CALL addMember(@p_lib_id, p_fname, p_lname, p_gender, p_email, 'Student', p_phone_no, p_password);
        INSERT INTO student( lib_id,bits_id, branch, semester)
        VALUES (@p_lib_id, p_bits_id, p_branch, p_semester);
        SET out_status = 0; -- 'Student registered successfully';
    ELSE
        SET out_status = 2; -- 'Email already exists';
    END IF;
END//
```

```
CREATE PROCEDURE addMember(  
BEGIN  
    -- Add member to 'member' table  
    INSERT INTO member (fname, lname, gender, email, mtype, status)  
    VALUES (p_fname, p_lname, p_gender, p_email, p_mtype, "Unlocked");  
    select lib_id into p_lib_id from member where email=p_email;  
    -- Add phone number to 'member_phone' table  
    INSERT INTO member_phone(lib_id, phone_no)  
    VALUES (p_lib_id, p_phone_no);  
  
    -- Add account information to 'account' table  
    INSERT INTO account(lib_id, password)  
    VALUES (p_lib_id, p_password);  
END//
```

```

CREATE PROCEDURE addBook(
BEGIN
    declare publisher_count int;
    declare shelf_count int;
    declare p_book_id int;
    DECLARE author_count INT;
    DECLARE book_exists INT;
    declare p_author_id int;
    declare p_inventory_id int;
    declare p_shelf_id int;

    SELECT COUNT(*) INTO book_exists
    FROM book
    WHERE title=p_title and year=p_year;

    IF book_exists > 0 THEN
        SET out_status = 1;

    ELSE
        -- Insert the book
        INSERT INTO book( title, year)
        VALUES (p_title, p_year);

        select last_insert_id() into p_book_id;

        INSERT INTO bookgenre (book_id, genre_name) VALUES (p_book_id, p_genre_name);

        -- Check if the publisher exists
        SELECT COUNT(*) INTO publisher_count
        FROM publisher
        WHERE pub_name = p_pub_name;

        -- If publisher does not exist, add it
        IF publisher_count =0 THEN
            INSERT INTO publisher(pub_name,location)
            VALUES (p_pub_name,p_location);

        END IF;
        insert into publishes(pub_name,book_id)
        VALUES (p_pub_name,p_book_id);
        -- Add the book to inventory
        -- Check if the author exists
        SELECT COUNT(*) INTO author_count

```

```

SELECT COUNT(*) INTO author_count
FROM author
WHERE fname=p_author_fname and lname=p_author_lname;

-- If author does not exist, add it
) IF author_count = 0 THEN

    INSERT INTO author( fname, lname)
    VALUES ( p_author_fname, p_author_lname);

- END IF;

select author_id into p_author_id from author
where fname=p_author_fname and lname=p_author_lname;

insert into writes(book_id,author_id)
VALUES (p_book_id,p_author_id);
-- Check if the book exists

SELECT COUNT(*) INTO shelf_count
FROM shelf
WHERE shelf_no = p_shelf_no and hall_no = p_hall_no;

-- If author does not exist, add it
) IF shelf_count = 0 THEN
    INSERT INTO shelf (shelf_no, hall_no)
    VALUES (p_shelf_no, p_hall_no);
- END IF;

select shelf_id into p_shelf_id FROM shelf
WHERE shelf_no = p_shelf_no and hall_no = p_hall_no;

SET out_status = 0;


- END IF;

select book_id into p_book_id from book
WHERE title=p_title and year=p_year;

INSERT INTO inventory( book_id, issued)
VALUES ( p_book_id, FALSE); -- Generate random inventory ID
select last_insert_id() into p_inventory_id;
insert into stored_in(inventory_id,shelf_id)
values(p_inventory_id,p_shelf_id);
- END//

```

- **Report Samples(Software/System Generated)**



—

□

×

Sign Up Member

First Name:

Aditya

Last Name:

Mittal

Gender:

☒ Male

☐ Female

☐ Other

Phone No:

9999999999

Email:

a@a.com

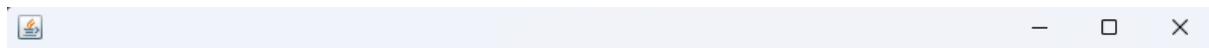
Member Type:

Student

Password:

abc

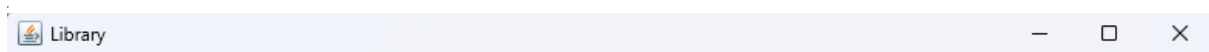
Next



Sign Up Student

BITS ID:	<input type="text" value="2022A7PS0005P"/>
Branch:	<input type="text" value="Computer Science"/>
Semester:	<input type="text" value="4"/>

Sign Up



Welcome to BITS Library

Email:

Password:

Sign In

Clear

Sign Up

Welcome Aditya Mittal

Log Out

name

Algorithms

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	0	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

genre

Computer Science

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	0	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	0	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4	1	7	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4	2	8	0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3	1	13	0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3	2	14	0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

author

Goodrich

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

author

Thomas

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	0	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	0	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	0	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	2			0	
7	Digital Electroni...	Floyd Thomas	Electronics	2			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	0	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4	1	7	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4	2	8	0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1	1	9	0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1	2	10	0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	2	1	11	0	
7	Digital Electroni...	Floyd Thomas	Electronics	2	2	12	0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3	1	13	0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3	2	14	0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	0	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intellig...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intellig...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	2			0	
7	Digital Electroni...	Floyd Thomas	Electronics	2			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17		0.00	Unreturned	
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17		0.00	Unreturned	
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17		0.00	Unreturned	
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Message

Book returned successfully.

OK

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Message

Book renewed successfully.

OK

Welcome Aditya Mittal

Log Out

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Update Details

Choose option to update:

Name

OKCancel

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Input

Enter new first name:

A

OKCancel

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Aditya Mittal

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Input

Enter new last name:

M

OKCancel

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Algorithm

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	

Rate Book

Select a rating:

4

OKCancel

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Algorithm

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	

Message

i

Your rating has been recorded.

OK

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Algorithm

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	4.00
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	4.00
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome John Doe

Log Out

name

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	4.00
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	4.00
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	1	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...				1	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...				0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics				0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics				0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics				0	
7	Digital Electron...	Floyd Thomas	Electronics				0	
8	Principles of Co...	Alfred Aho	Computer Scien...				0	
8	Principles of Co...	Alfred Aho	Computer Scien...				0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Message

Book is currently available for borrowing.

OK

Welcome John Doe

Log Out

name

Search

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	4.00
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	4.00
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	1	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intelle...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			1	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1			0	
6	Discrete Mathe...	Kenneth Rosen	Mathematics	2			0	
7	Digital Electroni...	Floyd Thomas	Electronics	2			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
8	Principles of Co...	Alfred Aho	Computer Scien...	3			0	
9	Data Structures ...	Michael T. Good...	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Message

Hold placed successfully.

OK

Welcome John Doe

Log Out

name

Search

title	Author	hold_date	hold_time	status
Database Management Syste...	Abraham Silberschatz	2024-04-17	22:04:19	Pending

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Message

There is a pending hold on this book.

OK

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Pending
5	Computer Networks	Andrew Tanenbaum	2024-04-17		0.00	Unreturned	
2	Database Manage...	Abraham Silbersc...	2024-04-17		0.00	Unreturned	

Message

Book returned successfully.

OK

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Alice Smith

name

Search

Search

Log Out

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
---------	-------	--------	-------------	-------------	------	-------------	---------------

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return

Sign Up Librarian

First Name:

Pratyush

Last Name:

Ghosh

Gender:

☒ Male

☐ Female

☐ Other

Phone No:

9999999998

Email:

b@b.com

Staff ID:

L2021004

Password:

abc

☒ Active

Sign Up

Sign Up Librarian

First Name:

Pratyush

Last Name:

Ghosh

Gender:

Other

Phone No:

Email:

b@b.com

Staff ID:

L20210004

Password:

abc

☒ Active

Sign Up

Message

Librarian registered successfully

OK

Welcome Alice Smith

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
<div><div>Message</div><div><div></div><div>Overdue locks processed successfully.</div><div>OK</div></div></div>							

Search

Log Out

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

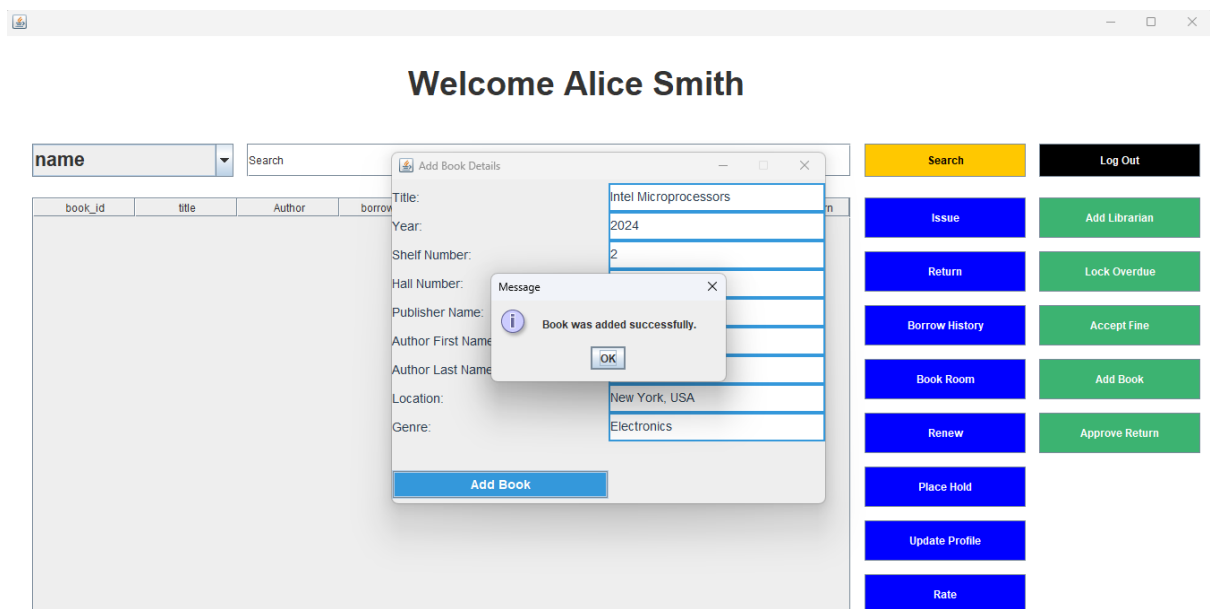
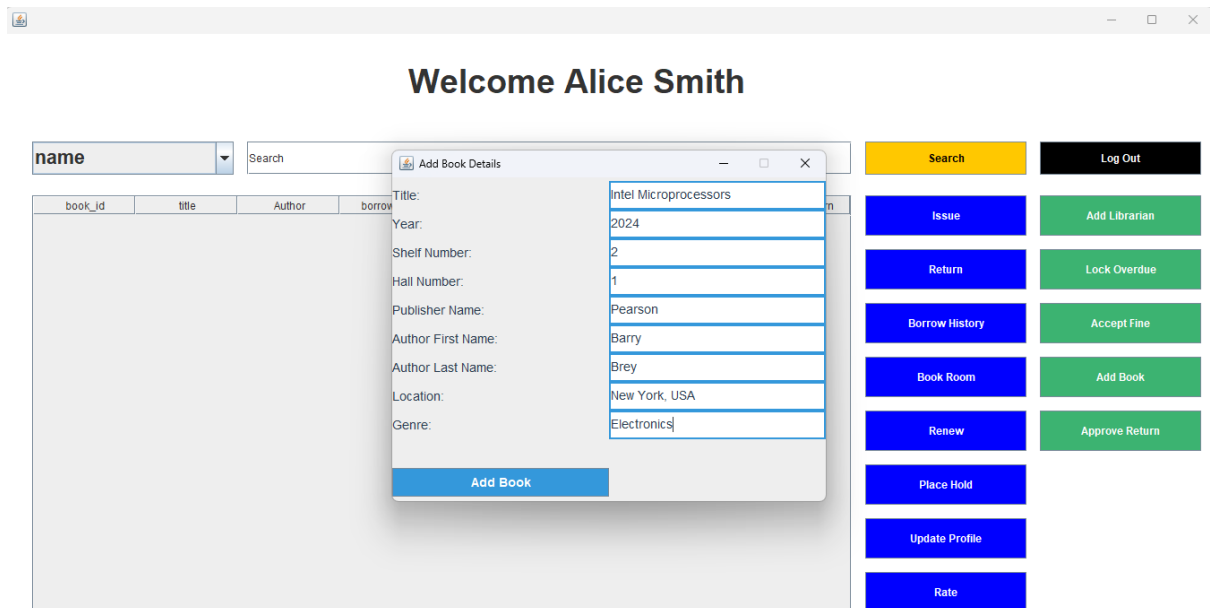
Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return



Welcome Alice Smith

name

Search

Log Out

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b...
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	1	1	1	4.00
1	Introduction to A...	Thomas Cormen	Computer Scien...	1	2	2	0	4.00
2	Database Mana...	Abraham Silber...	Computer Scien...	2	1	3	1	
4	Operating Syste...	Abraham Silber...	Computer Scien...	3	2	6	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	2	2	4	0	
3	Artificial Intell...	Stuart Russell	Computer Scien...	3	1	5	0	
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4				
5	Computer Netw...	Andrew Tanenb...	Computer Scien...	4				
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1				
6	Discrete Mathe...	Kenneth Rosen	Mathematics	1				
6	Discrete Mathe...	Kenneth Rosen	Mathematics	2				
7	Digital Electron...	Floyd Thomas	Electronics	2				
9	Principles of Co...	Alfred Aho	Computer Scien...	3				
8	Principles of Co...	Alfred Aho	Computer Scien...	3				
9	Data Structures	Michael T. Good	Computer Scien...	4	1	15	0	
10	Computer Orga...	David Patterson	Computer Scien...	4	2	16	0	
11	Intel Microproce...	Barry Brey	Electronics	1	2	17	0	

Message

Book return approvals processed successfully.

OK

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return

Welcome A M

name

Search

Search

Log Out

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
5	Computer Networks	Andrew Tanenbaum	2024-03-17	2024-04-17	55.00	Unpaid	Pending
1	Introduction to Al...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Approved
2	Database Manage...	Abraham Silbersc...	2024-04-17	2024-04-17	0.00	No Fine	Approved

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
5	Computer Networks	Andrew Tanenbaum	2024-03-17	2024-04-17	55.00	Unpaid	Pending
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Approved
2	Database Manage...	Abraham Silbersc...	2024-04-17	2024-04-17	0.00	No Fine	Approved

Message

Your account is locked.

OK

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome Alice Smith

Search

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
---------	-------	--------	-------------	-------------	------	-------------	---------------

Input

?

Enter the library ID:

11

OKCancel

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return

Welcome Alice Smith

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
<div><div>Input</div><div>?</div><div>Enter the payment amount:</div><div>100</div><div>OK</div><div>Cancel</div></div>							

Search

Log Out

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return

Welcome Alice Smith

name

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
<div><div>Message</div><div>i</div><div>All penalties paid and account is unlocked. Amount to be repaid : 45</div><div>OK</div></div>							

Search

Log Out

Issue

Return

Borrow History

Book Room

Renew

Place Hold

Update Profile

Rate

Add Librarian

Lock Overdue

Accept Fine

Add Book

Approve Return

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
5	Computer Networks	Andrew Tanenbaum	2024-03-17	2024-04-17	55.00	Paid	Pending
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Approved
2	Database Manage...	Abraham Silbersc...	2024-04-17	2024-04-17	0.00	No Fine	Approved

Message

Book issued successfully.

OK

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

Welcome A M

Log Out

name

Search

Search

book_id	title	Author	borrow_date	return_date	Fine	Fine Status	approvereturn
5	Computer Networks	Andrew Tanenbaum	2024-03-17	2024-04-17	55.00	Paid	Pending
1	Introduction to Alg...	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Approved
2	Database Manage...	Abraham Silbersc...	2024-04-17	2024-04-17	0.00	No Fine	Approved
1	Introduction to Alg...	Thomas Cormen	2024-04-17		0.00	Unreturned	

Issue

Return

Borrow History

View Holds

Renew

Place Hold

Update Profile

Rate

• Complex Queries with Output

```
CREATE PROCEDURE searchByAuthorName(  
    IN in_fname VARCHAR(50),  
    IN in_lname VARCHAR(50),  
    OUT out_status INT  
)  
BEGIN  
    DECLARE author_exists INT;  
  
    -- Search for the author  
    SELECT COUNT(*) INTO author_exists  
    FROM author  
    WHERE LOWER(fname) LIKE CONCAT('%',LOWER(in_fname),'%') AND LOWER(lname) LIKE CONCAT('%',LOWER(in_lname),'%');  
  
    IF author_exists = 0 THEN  
        -- Author not found  
        SET out_status = 1; -- Not found  
    ELSE  
        -- Display details of books by the author and their inventory copies  
        SELECT b.book_id, b.title, CONCAT(a.fname, ' ', a.lname) AS  
            author_name, bg.genre_name, s.hall_no, s.shelf_no,  
            inv.inventory_id, inv.issued, FindAvgRating(b.book_id)  
        FROM book b  
        JOIN writes w ON (b.book_id = w.book_id)  
        JOIN author a ON (w.author_id = a.author_id)  
        JOIN bookgenre bg ON (b.book_id = bg.book_id)  
        JOIN inventory inv ON (b.book_id = inv.book_id)  
        JOIN stored_in si ON (inv.inventory_id = si.inventory_id)  
        JOIN shelf s ON (si.shelf_id = s.shelf_id)  
        WHERE LOWER(fname) LIKE CONCAT('%',LOWER(in_fname),'%') AND  
            LOWER(lname) LIKE CONCAT('%',LOWER(in_lname),'%');  
  
        SET out_status = 0; -- Found  
    END IF;  
END //
```

1006 • call searchByAuthorName("Tho","",@out_status);

book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b.book_id)
1	Introduction to Algorithms	Thomas Cormen	Computer Science	1	1	1	0	NULL
1	Introduction to Algorithms	Thomas Cormen	Computer Science	1	2	2	0	NULL

```

CREATE PROCEDURE searchByBookName(
    IN in_title VARCHAR(100),
    OUT out_status INT
)
BEGIN
    DECLARE book_exists INT;

    -- Search for the book by title
    SELECT COUNT(*) INTO book_exists
    FROM book
    WHERE LOWER(title) LIKE CONCAT('%', LOWER(in_title), '%');

    IF book_exists = 0 THEN
        -- Book not found
        SET out_status = 1; -- Not found
    ELSE
        -- Display details of the book and its inventory copies
        SELECT b.book_id, b.title, CONCAT(a.fname, ' ', a.lname) AS
        author_name, bg.genre_name, s.hall_no, s.shelf_no,
        inv.inventory_id, inv.issued, FindAvgRating(b.book_id)
        FROM book b
        INNER JOIN writes w ON b.book_id = w.book_id
        INNER JOIN author a ON w.author_id = a.author_id
        INNER JOIN bookgenre bg ON b.book_id = bg.book_id
        INNER JOIN inventory inv ON b.book_id = inv.book_id
        INNER JOIN stored_in si ON inv.inventory_id = si.inventory_id
        INNER JOIN shelf s ON si.shelf_id = s.shelf_id
        WHERE LOWER(title) LIKE CONCAT('%', LOWER(in_title), '%');

        SET out_status = 0; -- Found
    END IF;
END //

```

```
1011 • call searchByBookName("algo",@out_status);
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:					
	book_id	title	author_name	genre_name	hall_no	shelf_no	inventory_id	issued	FindAvgRating(b.book_id)
▶	1	Introduction to Algorithms	Thomas Cormen	Computer Science	1	1	1	0	NULL
	1	Introduction to Algorithms	Thomas Cormen	Computer Science	1	2	2	0	NULL
	9	Data Structures and Algorithms in Python	Michael T. Goodrich	Computer Science	4	1	15	0	NULL

```

CREATE PROCEDURE borrowHistory (
    IN in_lib_id INT
)
BEGIN
    SELECT
        b.book_id,
        b.title AS 'Book Title',
        CONCAT(a.fname, ' ', a.lname) AS 'Author',
        br.borrow_date AS 'Borrow Date',
        br.return_date AS 'Return Date',
        COALESCE(p.amount, 0) AS 'Fine',
        CASE
            WHEN p.paid_status = 'Paid' THEN 'Paid'
            WHEN br.return_date IS NULL THEN 'Unreturned'
            WHEN p.amount IS NULL THEN "No Fine"
            ELSE 'Unpaid'
        END AS 'Fine Status',
        br.approvereturn as 'Status'
    FROM
        borrows br
    JOIN
        inventory i ON br.inventory_id = i.inventory_id
    JOIN
        book b ON i.book_id = b.book_id
    LEFT JOIN
        penalty p ON br.borrow_id = p.borrow_id
    JOIN
        writes w ON b.book_id = w.book_id
    JOIN
        author a ON w.author_id = a.author_id
    WHERE
        br.lib_id = in_lib_id
    ORDER BY
        br.borrow_date;
END //

```

152 • `CALL borrowHistory(11);`



Result Grid Filter Rows: Export: Wrap Cell Content: I A								
	book_id	Book Title	Author	Borrow Date	Return Date	Fine	Fine Status	Status
▶	5	Computer Networks	Andrew Tanenbaum	2024-03-17	2024-04-17	55.00	Paid	Approved
	1	Introduction to Algorithms	Thomas Cormen	2024-04-17	2024-04-17	0.00	No Fine	Approved
	2	Database Management Systems	Abraham Silberschatz	2024-04-17	2024-04-17	0.00	No Fine	Approved
	1	Introduction to Algorithms	Thomas Cormen	2024-04-17	NULL	0.00	Unreturned	NULL

```

CREATE PROCEDURE viewHolds (
    IN in_lib_id INT
)
BEGIN
    SELECT
        b.title AS 'Book Title',
        CONCAT(a.fname, ' ', a.lname) AS 'Author',
        h.hold_date AS 'Hold Date',
        h.hold_time AS 'Hold Time',
        h.status AS 'Status'
    FROM
        holds h
    JOIN
        book b ON h.book_id = b.book_id
    JOIN
        writes w ON b.book_id = w.book_id
    JOIN
        author a ON w.author_id = a.author_id
    WHERE
        h.lib_id = in_lib_id
    ORDER BY
        h.hold_date,
        h.hold_time;
END //

```

152 • `CALL viewHolds(1);`

Result Grid  Filter Rows: Export:  Wrap Cell Content: 

	Book Title	Author	Hold Date	Hold Time	Status
►	Database Management Systems	Abraham Silberschatz	2024-04-17	22:04:19	Approved

Conclusions:

In conclusion, our library app provides a straightforward solution for managing library tasks like borrowing, returning books, and placing holds. It offers practical features to improve the library experience for users.