

## **Test Plan Library Management System**

### **Team Member 1 :-**

NAME : YUGABHARATHI E

SRN : PES1UG22CS716

### **Team Member 2 :-**

NAME : VISHAL KUMAR RAHUL

SRN : PES1UG22CS700

## **1. Introduction**

The Library Management System is designed to automate and streamline library operations such as student and book management, book issuing, and returning processes. It aims to enhance the efficiency of library operations while providing a user-friendly interface for librarians and students.

### **1.1 Scope**

**In Scope:**

- **User Management:** Registration and management of student information.

- **Book Management:**

Addition, deletion, and management of books, including checking stock status.

- **Book Issuing and Returning:** Streamlined process for issuing and returning books to and from students.

- **Data Retrieval:** Display of students, books, and issued books information.

- **Validation:** Input validation to prevent incorrect data entry and handle errors gracefully.

### **Out of Scope:**

- Integration with external library networks.

- Advanced analytics for book lending patterns.

- Mobile app integration.

## **1.2 Quality Objectives**

The goal is to develop a secure, efficient, and easy-to-use Library Management System that ensures minimal errors and optimal performance. The system must

handle data operations smoothly and display accurate information while preventing unauthorized data access.

### **1.3 Roles and Responsibilities**

- **Project Manager:** Oversees the project timeline, allocates resources, and ensures timely deliverables.

- **Lead Developer:** Manages the overall system architecture, code quality, and feature development.

- **Backend Developer:**

Handles database integration and operations, including data validation and transaction management.

- **Frontend Developer:**

Designs and implements the graphical user interface using Tkinter.

- **Product Tester:**

Performs unit, integration, and system testing, documenting results and reporting issues.

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## **2. Test Methodology**

## **2.1 Test Levels**

### **- Unit Testing:**

Testing individual functions such as student registration, book addition, book issuing, and validation mechanisms.

### **- Integration Testing:**

Ensuring components like book issuing, student data management, and data validation mechanisms work together seamlessly.

### **- System Testing:**

Conducting end-to-end testing of the Library Management System to ensure all features function correctly in a real-world scenario.

### **- User Acceptance Testing (UAT):**

Confirming the system meets the needs and expectations of users such as librarians and students.

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## **3. Test Deliverables**

### **- Test Plan:**

A document outlining the testing process, strategies, and methodologies.

**- Test Cases:**

Detailed test scenarios covering all functionalities, including user and book management.

**- Bug Reports:**

Comprehensive documentation of identified bugs, their severity, and current status.

**- Test Scripts:**

Scripts for automated testing (if applicable) to cover key functions like data entry and retrieval.

**- Test Summary Report:**

A summary detailing test outcomes, issues found, and overall system performance.

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## **4. Resource & Environment Needs**

### **4.1 Testing Tools**

- **MySQL Workbench:** Used for managing and validating the database structure and operations,

ensuring the accuracy of data storage and retrieval.

- **PyCharm/VS Code:** An integrated development environment (IDE) for writing, debugging, and testing the Python code efficiently.
- **Tkinter:** The Python library used for creating the graphical user interface (GUI) of the Library Management System. It's tested directly within the Python environment.
- **Python Unit Test Library:** For writing and running unit tests to validate individual components of the system, such as data insertion and retrieval.
- **Manual Testing:** Conducted using the GUI interface to check all functionalities like adding and deleting students/books, issuing and returning books.

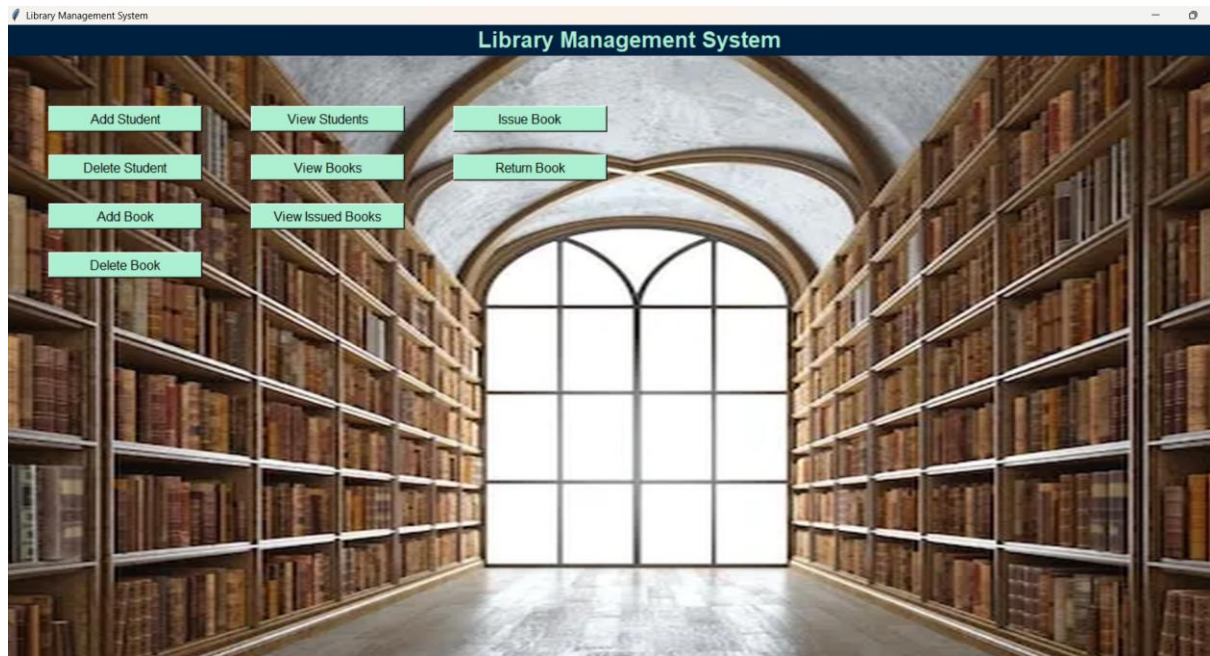
## 4.2 Test Environment

- **Operating System:** Windows 10 or later / macOS / Linux
- **Python Version:** Python 3.10 or later, configured with necessary libraries (mysql.connector, tkinter, etc.)
- **Database:** MySQL 8.0, running locally or on a test server to handle library data operations.

- **Hardware Requirements:**
  - Processor: Intel Core i3 or equivalent
  - RAM: 4GB minimum (8GB recommended)
  - Disk Space: At least 500MB free space for code and database
- **Network Requirements:** Local network access for connecting to the MySQL database if it's hosted separately.


<b>TRIGGERS</b>	Update book Quantity and restore book quantity
<b>JOINS</b>	Issued books to student id and book id

## RESULTS:-



## ADD STUDENT:-



 Add Student

ERP

700

Name

Vishal Kumar Rahul

Course

CSE

Year

3

Contact

9142018494

Email

vishalkumarrahul2504@gn

Save

 Success

×



Student added successfully!

OK

```
mysql> select * from students;
```


ERP	Name	Course	Year	Contact	Email	NoBook
700	Vishal Kumar Rahul	CSE	3	9142018494	vishalkumarrahul2504@gmail.com	0
716	Yugabharathi E	CSE	3	8296226222	eyuga@gmail.com	0

2 rows in set (0.00 sec)

## VIEW STUDENTS:

ERP	Name	Course	Year
700	Vishal Kumar Rahul	CSE	3
716	Yugabharathi E	CSE	3

### ADD BOOK:

 Add Book

Book ID

200

Title

DBMS

Author

MAHITA


Edition

2022

Quantity

10

Save

 Success

×



Book added successfully!

OK

```
mysql> select * from books;
+-----+-----+-----+-----+-----+-----+
| BookID | Title | Author | Edition | Quantity | Status |
+-----+-----+-----+-----+-----+-----+
| 200 | DBMS | MAHITA | 2022 | 10 | Available |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

### View books:

View Books											
	Book ID	Title	Author	Edition	Quantity	Status					
200		DBMS	MAHITA	2022	10	Available					

## ISSUE BOOKS:

Issue Book

Student ER

700

Book ID

200

Issue Date

2024-11-29

Issue

Success

i

Book issued successfully!

OK

## SHOW ISSUE BOOKS:-

Student ERP	Name	Book ID	Book Title	Issue Date	Return Date
700	Vishal Kumar Rahul	200	DBMS	2024-11-29	None

```
mysql> select * from issuedbooks;
+-----+-----+-----+-----+
| ERP | BookID | IssueDate | ReturnDate |
+-----+-----+-----+-----+
| 700 | 200 | 2024-11-29 | NULL |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

```
mysql> select * from students;
+-----+-----+-----+-----+-----+-----+-----+
| ERP | Name | Course | Year | Contact | Email | NoBook |
+-----+-----+-----+-----+-----+-----+-----+
| 700 | Vishal Kumar Rahul | CSE | 3 | 9142018494 | vishalkumarrahul2504@gmail.com | 1 |
| 716 | Yugabharathi E | CSE | 3 | 8296226222 | eyuga@gmail.com | 0 |
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

## TRIGGERS:-

Here trigger is used to update and restore books.

Book ID	Title	Author	Edition	Quantity	Status
200	MAHITA		2022	9	Available

## RETURN BOOKS:-

Return Book

Student ER

700

Book ID

200

Return Date

2024-11-29

Return

Success



Book returned successfully!

OK

View Books									
	Book ID	Title	Author	Edition	Quantity	Status			
200		DBMS	MAHITA	2022	10	Available			

Here trigger is used which restore the book quantity from 9 to 10 after returning book.

## DELETE BOOKS:

Success

Book deleted successfully!

OK

D. — □ ×

Enter ID of the book to delete:

200

OK Cancel

View Books

Book ID	Title	Author	Edition	Quantity	Status
---------	-------	--------	---------	----------	--------

```
mysql> select * from books;
Empty set (0.00 sec)

mysql>
```