

A Project Report on
Digital Library Management System
Submitted to Manipal University, Jaipur
Computers Science and Engineering with
Specialization in Artificial Intelligence and
Machine Learning 2021-2025

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Introduction

The Database Library System is intended to Automate the borrowing of books by students. First all the students will have to create an account on the platform using their university's email address and then verify the same via an otp. Users trying to borrow books just have to fill up some info on the application which will be confirmed while going out of the library using a sensor. While returning the book if the return date is greater than the date when it should have been returned then a fine is added to the student's account. Library activities such as creating a new borrower, giving books to the borrowers, maintaining the details of all the item that were available in the books. This also helps the librarians by providing information such as total copies available of each book etc.

Motivation

Library Management System stores every information electronically and in an organized and systematic way which leads to effective results. It enhances the overall performance of the students and develops the habit of silent reading. The software is designed in such a way that it modernizes the library management system and help the students to make the best use of Library Automation System. It saves the students from lining up to borrow books and directly issue the book from the application. It also helps the student to search for a particular book and check whether it is currently available in the Library or not.

Project Objective

The project aims to create an alterable database to increase efficiency of Library Management system. This project aims to connect the students to the library. Even so, this system has the following advantages and disadvantages:

Advantages of Online Library Management System are:

1. It is user-friendly software.
2. It is cost-effective and easy to install.
3. It increases the efficiency.
4. The data is secure as the database is on phpmyadmin.co

Disadvantages of Online Library Management System are:

1. Complicated to operate.
2. Online Systems require high-speed internet connectivity.

Methodology/ Planning of work:

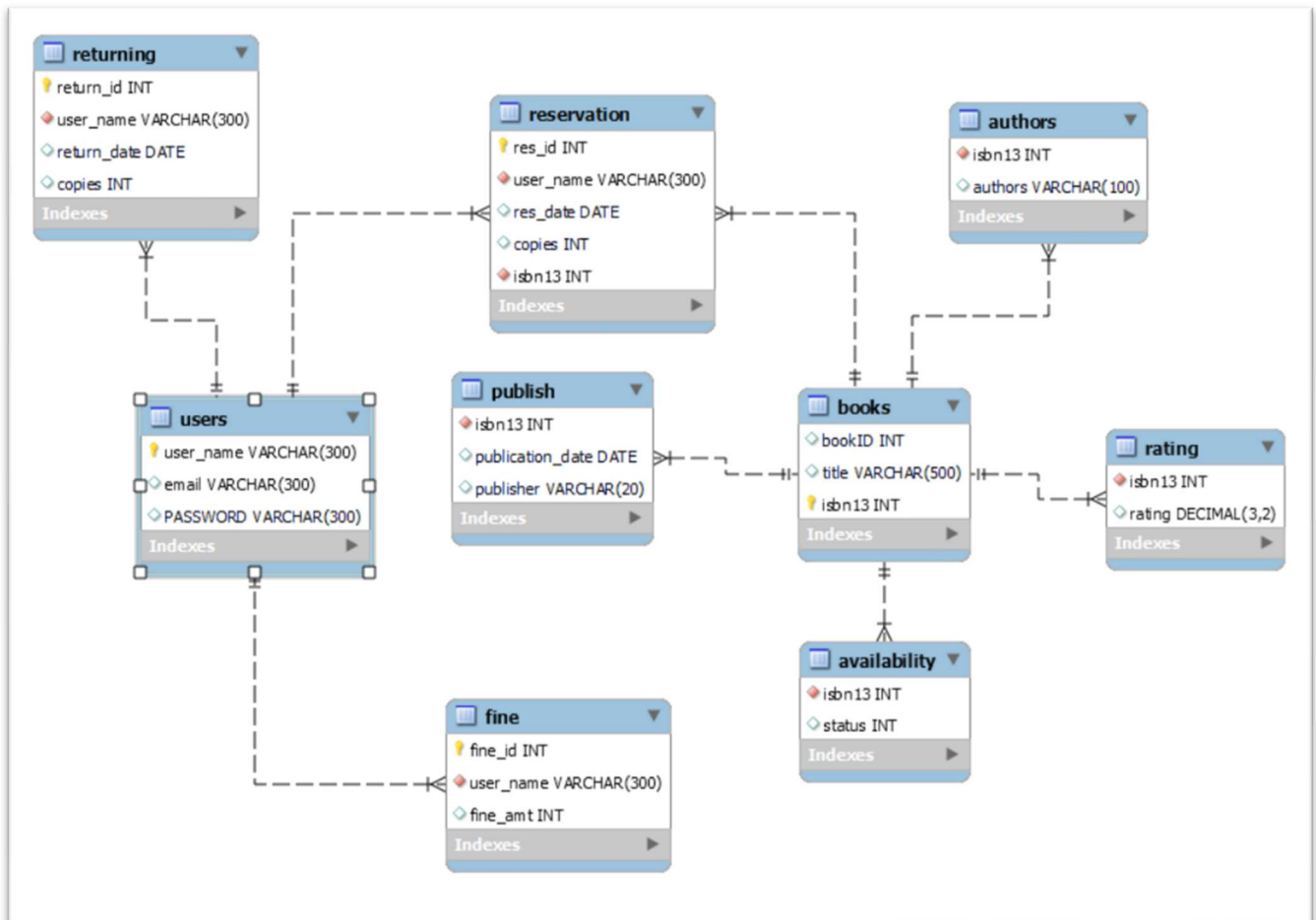
In order to tackle the problem, the work is divided into following phases:

1. **Reconnaissance:** This phase will help to identify the problem and ideate the project.
2. **Planning:** This phase will create an ER Diagram, Relational Schema and SQL Queries to generate tables for the database.
3. **App Launch:** Creation and Launching of desktop app.

Facilities required for proposed work:

1. MySQL Server
2. PHPMyAdmin
3. Python
4. Tkinter Library for GUI

Enhanced Entity Relationship Diagram:



Print View – Data dictionary:

AUTHORS

| Column | Type | Null | Default | Comments |
|---------|--------------|------|-------------|----------|
| isbn13 | int(11) | No | | |
| authors | varchar(100) | Yes | <i>NULL</i> | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|------------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| fk_authors_books | BTREE | No | No | isbn13 | 0 | A | No | |

AVAILABILITY

| Column | Type | Null | Default | Comments |
|--------|---------|------|-------------|----------|
| isbn13 | int(11) | No | | |
| status | int(1) | Yes | <i>NULL</i> | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|-----------------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| fk_availability_books | BTREE | No | No | isbn13 | 0 | A | No | |

BOOKS

| Column | Type | Null | Default | Comments |
|---------------------------|--------------|------|-------------|----------|
| bookID | int(11) | Yes | <i>NULL</i> | |
| title | varchar(500) | Yes | <i>NULL</i> | |
| isbn13 (<i>Primary</i>) | int(11) | No | 0 | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|--------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | isbn13 | 0 | A | No | |

FINE

| Column | Type | Null | Default | Comments |
|--------------------------|--------------|------|-------------|----------|
| <i>fine_id (Primary)</i> | int(11) | No | | |
| user_name | varchar(300) | No | | |
| fine_amt | int(11) | Yes | <i>NULL</i> | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------------|-------|--------|--------|-----------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | fine_id | 0 | A | No | |
| fk_fine_users | BTREE | No | No | user_name | 0 | A | No | |

PUBLISH

| Column | Type | Null | Default | Comments |
|------------------|-------------|------|-------------|----------|
| isbn13 | int(11) | No | | |
| publication_date | date | Yes | <i>NULL</i> | |
| publisher | varchar(20) | Yes | <i>NULL</i> | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|------------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| fk_publish_books | BTREE | No | No | isbn13 | 0 | A | No | |

RATING

| Column | Type | Null | Default | Comments |
|--------|--------------|------|-------------|----------|
| isbn13 | int(11) | No | | |
| rating | decimal(3,2) | Yes | <i>NULL</i> | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|-----------------|-------|--------|--------|--------|-------------|-----------|------|---------|
| fk_rating_books | BTREE | No | No | isbn13 | 0 | A | No | |

RESERVATION

| Column | Type | Null | Default | Comments |
|---------------------------|--------------|------|-------------|----------|
| res_id (<i>Primary</i>) | int(11) | No | | |
| user_name | varchar(300) | No | | |
| res_date | date | Yes | <i>NULL</i> | |
| copies | int(11) | Yes | <i>NULL</i> | |
| isbn13 | int(11) | No | | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|----------------------|-------|--------|--------|-----------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | res_id | 0 | A | No | |
| fk_reservation_users | BTREE | No | No | user_name | 0 | A | No | |
| fk_reservation_books | BTREE | No | No | isbn13 | 0 | A | No | |

RETURNING

| Column | Type | Null | Default | Comments |
|------------------------|--------------|------|---------|----------|
| return_id (Primary) | int(11) | No | | |
| user_name | varchar(300) | No | | |
| return_date | date | Yes | NULL | |
| copies | int(11) | Yes | NULL | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|--------------------|-------|--------|--------|-----------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | return_id | 0 | A | No | |
| fk_returning_users | BTREE | No | No | user_name | 0 | A | No | |

USERS

| Column | Type | Null | Default | Comments |
|------------------------|--------------|------|---------|----------|
| user_name (Primary) | varchar(300) | No | | |
| email | varchar(300) | Yes | NULL | |
| PASSWORD | varchar(300) | Yes | NULL | |

Indexes

| Keyname | Type | Unique | Packed | Column | Cardinality | Collation | Null | Comment |
|---------|-------|--------|--------|-----------|-------------|-----------|------|---------|
| PRIMARY | BTREE | Yes | No | user_name | 0 | A | No | |

Bibliography/References:

1. Oracle Academy
2. Database System Concepts by Abraham Silberschatz, Henry F. Korth, S. Sudarshan
3. phpMyAdmin
4. stackoverflow