Library Management System '24

PLETHORA OF BOOKS

LMS '24
Books Everywhere!

LIBM'24

E X A M
R E P O R T

v1.5

Lokesh Patra

FET-BDS-2022-26-020

SRI SRI UNIVERSITY
LEARN • LEAD • SERVE

I N D E X

1. Project Overview

The **Library Management System** is a web application designed to streamline and manage library activities, including user registration, book management, and book searching. This system ensures that users can efficiently interact with library resources via an intuitive interface, while administrators can maintain a structured backend database.

- **Key Features:**

    Frontend

    1. **Home Page**: Displays two buttons—*Register* and *Log In*—to guide users to the respective functionalities.
    2. **Registration Page**: Allows new users to register with a username, email, and password.
    3. **Log In Page**: Authenticates existing users by checking credentials against the database.
    4. **Dashboard Page**:
        - Displays a welcome message for the logged-in user.
        - Provides navigation options: Add Book, Search Books, and Log Out.
    5. **Add Book Page**: Users can add new books to the library database by entering details like Title, Author, Genre, and Publication Year.
    6. **Search Books Page**:
        - Users can search for books by Title, Author, or Publication Year.
        - Includes an option to export the search results into an XML file, along with a genre count.

    Backend

    - Implements PHP scripts to handle database operations for *user registration*, *login*, *book addition, search functionality*, and *XML generation*.
    - Securely connects to a **MySQL database** (library_db) containing:
        - **Users Table**: Stores user credentials.
        - **Books Table**: Stores book details.

2. Database Design [library_db]

Our database consists of two main tables, capturing user information and their waste entries:

➢ users Table
- Stores user details for authentication and identification:

Column Name	Data Type	Description
id	INT (primary key)	Unique Identifier
username	VarChar	User's Chosen Alias
password	VarChar	Hashed /Encrypted Password for Security
email	VarChar	User's Email Address

➢ books Table
- Records daily waste for authentication and identification:

Column Name	Data Type	Description
id	INT(primary key)	Unique Identifier
title	VarChar	Title of the Book
author	VarChar	Author of the Book
genre	VarChar	Genre of the book
publication_year	INT (4)	Publication Year of the Book

3. Project Structure

Frontend Files

- index.html (Home Page)
- register.html (Registration Page)
- login.html (Login Page)
- dashboard.html (Dashboard Page)
- addbook.html (Add Book Page)
- searchbooks.html (Search Books Page)

Backend Files

- register.php (Handles user registration)
- login.php (Handles user authentication)
- addbook.php (Stores book details in the database)
- searchbooks.php (Fetches book data from the database)
- export_to_xml.php (Generates XML file with genre counts)
- session.php (Manages user sessions)
- logout.php (Handles user logout)

4. User Registration & LogIn

HTML Code:

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="icon" type="image/x-icon" href="favicon\android-chrome-512x512.png">
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>User Registration</title>
    <link rel="stylesheet" href="common.css">
    <link rel="stylesheet" href="register.css">
</head>
<body>
    <header>
        <h1><a href="index.html" style="text-decoration: none; color: inherit;">Library Management System</a></h1>
    </header>
    <form id="registerForm" action="register.php" method="POST">
        <h2>Register</h2>
        <label for="username">Username:</label>
        <input type="text" id="username" name="username" required><br>

        <label for="email">Email:</label>
        <input type="email" id="email" name="email" required><br>

        <label for="password">Password:</label>
        <input type="password" id="password" name="password" required><br>

        <button type="submit">Register</button>
    </form>
    <footer>
        © 2024 Library Management System. All rights reserved. | Created by <a href="https://lightxlk.github.io"
target="_blank" style="text-decoration: none; color: inherit;">Light</a>
    </footer>
</body>
</html>
```

.php:

```php
<?php
require 'db_config.php';

if ($_SERVER["REQUEST_METHOD"] === "POST") {
    $username = $_POST['username'];
    $email = $_POST['email'];
    $password = password_hash($_POST['password'], PASSWORD_BCRYPT);

    // Check if email already exists
    $checkQuery = $conn->prepare("SELECT * FROM users WHERE email = ?");
    $checkQuery->bind_param("s", $email);
    $checkQuery->execute();
    $result = $checkQuery->get_result();

    if ($result->num_rows > 0) {
        echo "<div class='error'>Email already exists! <a href='register.html'>Go back</a></div>";
        exit;
    }

    // Insert user into the database
    $stmt = $conn->prepare("INSERT INTO users (username, email, password) VALUES (?, ?, ?)");
    $stmt->bind_param("sss", $username, $email, $password);

    if ($stmt->execute()) {
        echo "<div class='success'>Registration successful! <a href='login.html'>Login here</a></div>";
    } else {
        echo "<div class='error'>Error registering user. Please try again.</div>";
    }
}
?>
```

Similarly, the LogIn page is programmed.

5. Dashboard Page

HTML Code:

```php
<?php include 'navbar.php'; ?>
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="icon" type="image/x-icon" href="favicon\android-chrome-512x512.png">
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Dashboard</title>
    <link rel="stylesheet" href="common.css">
    <link rel="stylesheet" href="dashboard.css">
</head>
<body>
    <main>
        <h2><a href="index.html" style="text-decoration: none; color: inherit;">Welcome to the
Dashboard</a></h2>
        <div class="actions">
            <a href="add_book.html">Add Book</a>
            <a href="search_books.html">Search Books</a>
        </div>
    </main>
    <footer>
        © 2024 Library Management System. All rights reserved. | Created by <a href="https://lightxlk.github.io"
target="_blank" style="text-decoration: none; color: inherit;">Light</a>
    </footer>
</body>
</html>
```

6. Add Book Page

HTML:

```php
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="icon" type="image/x-icon" href="favicon\android-chrome-512x512.png">
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Add Book</title>
    <link rel="stylesheet" href="common.css">
    <link rel="stylesheet" href="add_book.css">
</head>
<body>
    <?php include 'navbar.php'; ?>

    <main>
        <h1><a href="index.html" style="text-decoration: none; color: inherit;">Add a New Book</a></h1>
        <form action="add_book.php" method="POST">
            <div class="form-group">
                <label for="title">Title:</label>
                <input type="text" id="title" name="title" required placeholder="Enter book title">
            </div>

            <div class="form-group">
                <label for="author">Author:</label>
                <input type="text" id="author" name="author" required placeholder="Enter author's name">
            </div>

            <div class="form-group">
                <label for="publication_year">Publication Year:</label>
                <input type="number" id="publication_year" name="publication_year" min="2000" required
placeholder="Enter publication year (after 2000)">
            </div>

            <div class="form-group">
                <label for="genre">Genre:</label>
                <input type="text" id="genre" name="genre" required placeholder="Enter genre">
            </div>

            <button type="submit">Add Book</button>
        </form>
    </main>

    <footer>
        © 2024 Library Management System. All rights reserved. | Created by <a href="https://lightxlk.github.io"
target="_blank" style="text-decoration: none; color: inherit;">Light</a>
    </footer>
</body>
</html>
```

7. Search Books Page

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <link rel="icon" type="image/x-icon" href="favicon\android-chrome-512x512.png">
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Search Books</title>
    <link rel="stylesheet" href="common.css">
    <link rel="stylesheet" href="search_books.css">
</head>
<body>
    <?php include 'navbar.php'; ?>

    <main>
        <h1><a href="index.html" style="text-decoration: none; color: inherit;">Search Books</a></h1>

        <form id="searchForm">
            <label for="title">Title:</label>
            <input type="text" id="title" name="title"><br>

            <label for="author">Author:</label>
            <input type="text" id="author" name="author"><br>

            <label for="publication_year">Publication Year:</label>
            <input type="number" id="publication_year" name="publication_year"><br>

            <button type="submit">Search</button>
            <button type="button" id="exportXMLBtn">Export to XML</button>
        </form>

        <h2>Search Results:</h2>
        <table>
            <thead>
                <tr>
                    <th>Title</th>
                    <th>Author</th>
                    <th>Publication Year</th>
                    <th>Genre</th>
                </tr>
            </thead>
            <tbody id="results">
                <!-- Results will be dynamically added here -->
            </tbody>
        </table>
    </main>

    <footer>
        <p>© 2024 Library Management System</p>
    </footer>
    <script>
        let searchResults = []; // Store search results for export

        document.getElementById('searchForm').addEventListener('submit', function(event) {
            event.preventDefault();
            const formData = new FormData(this);

            fetch('search_books.php?' + new URLSearchParams(formData))
            .then(response => response.json())
            .then(data => {
                searchResults = data; // Update search results
                const resultsTable = document.getElementById('results');
                resultsTable.innerHTML = '';

                if (data.length > 0) {
                    data.forEach(book => {
                        const row = document.createElement('tr');
                        row.innerHTML = `
                            <td>${book.title}</td>
                            <td>${book.author}</td>
                            <td>${book.publication_year}</td>
                            <td>${book.genre}</td>
                        `;
                        resultsTable.appendChild(row);
                    });
                } else {
                    const row = document.createElement('tr');
                    row.innerHTML = `<td colspan="4">No results found</td>`;
                    resultsTable.appendChild(row);
                }
            })
            .catch(error => {
                console.error('Error fetching search results:', error);
            });
        });
```
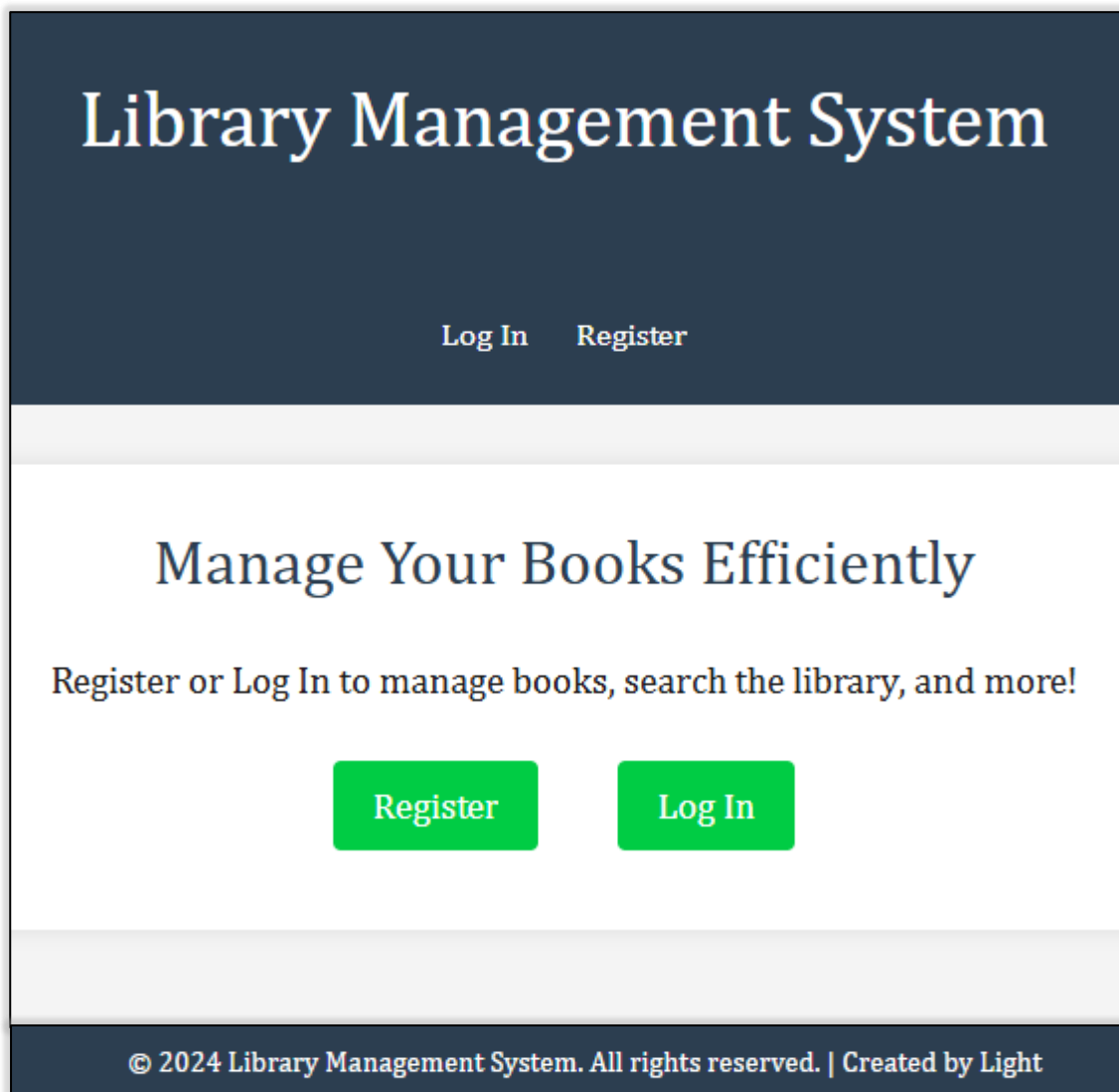
```
        document.getElementById('exportXMLBtn').addEventListener('click', function () {
            fetch('export_books.php', {
                method: 'POST',
                headers: { 'Content-Type': 'application/json' },
                body: JSON.stringify({ search_results: searchResults })
            })
            .then(response => response.text())
            .then(data => {
                alert(data); // Display the server's response as an alert
            })
            .catch(error => {
                alert('Error exporting to XML.');
                console.error(error);
            });
        });
    </script>
    <footer>
        © 2024 Library Management System. All rights reserved. | Created by <a href="https://lightxlk.github.io"
target="_blank" style="text-decoration: none; color: inherit;">Light</a>
    </footer>
</body>
</html>
```

All programs were saved and ran in XAMPP Server,
tested in local machine and executed successfully.

8. **Screenshots**:

Figure 1 Home Page

Library Management System

Register

Username:

light

Email:

light@lms.in

Password:

••••••••

Register

id	username	email	password
1	first	first@lms.in	$2y$10$Lz-SpIpb0xrIWsq.Ji3hD9l.GvYsvJx
2	second	second@lms.in	$2y$10$SnPrZOrmSUN4jRsDXu2Rz.xbB
3	third	third@lms.in	$2y$10$s.krhiK7muUWslEChLx2c.bVemc
4	sophiek	justsophie@lms.in	$2y$10$hP.W092SgATFOE9HZLUQUeJy
5	soumya	soumya@lms.in	$2y$10$YtAOdDlzaVcqNbUUXMniiuhz8Z
6	light	light@lms.in	$2y$10$LDdd1Eh7bMSzv3EOEedaHu./Z

Figure 2 Registration Page

Login

Username/Email:

light

Password:

••••••••

Login

Figure 3 LogIn Page

Library Management System

Welcome, light!   Dashboard   Add Book   Search Books   Logout

Welcome to the Dashboard

Add Book   Search Books

Figure 4 Dashboard Page

Add a New Book

Title:

The Subtle of Not Givin' a F

Author:

Mark Manson

Publication Year:

2010

Genre:

Life

Add Book

Figure 5 Add Book Page

Figure 6 'books' table in library_db

Figure 7 Search Books Page

```
▼<Library>
  ▼<Book>
     <id>9</id>
     <title>style test</title>
     <author>second</author>
     <publication_year>2010</publication_year>
     <genre>Style</genre>
  </Book>
  ▼<Book>
     <id>12</id>
     <title>Kuby Immunology</title>
     <author>Judith A. Owen</author>
     <publication_year>2010</publication_year>
     <genre>Immunology</genre>
  </Book>
  ▼<Book>
     <id>15</id>
     <title>The Subtle of Not Givin' a F</title>
     <author>Mark Manson</author>
     <publication_year>2010</publication_year>
     <genre>Life</genre>
  </Book>
```
```
▼<GenreCounts>
  ▼<Genre>
     <Name>Style</Name>
     <Count>1</Count>
  </Genre>
  ▼<Genre>
     <Name>Immunology</Name>
     <Count>1</Count>
  </Genre>
  ▼<Genre>
     <Name>Life</Name>
     <Count>1</Count>
  </Genre>
  </GenreCounts>
</Library>
```

Figure 8 Exported Books XML

9. Potential Future Upgrades

✚ Visual Enhancements:

- Add a *fa-eye-slash* icon for password visibility toggling in the registration and login pages.
- Add a dynamic picture gallery on the Home Page.

✚ Navigation Improvements:

- Implement a *navigation menu* on every page for seamless navigation.
- Include a *Log Out button* on every page for easier access.

✚ Advanced Features:

- Integrate user roles (e.g., Admin vs. User).
- Add *pagination* to search results for better readability.
- Implement advanced *filters* and *sorting* options for book searches.
- Add a feature to *upload* book cover images.
- Create a *borrowing/return* system with due date reminders.

✚ Performance Enhancements:

- Optimize database queries.
- Implement *caching* for *frequently searched books*.

more to be added…

10. **GitHub**

All files and screenshots, along with all the versions (v1 > v1.x) are uploaded and updated on GitHub under the © lightxlk [Lokesh Patra], November 2024.

Lokesh Patra

FET-BDS-2022-26-020

Baccalaureus Technologiae in CSE w/ Spl. in DataScience

Faculty Of Engineering & Technology

Sri Sri University

Cuttack

---/---