# LIBRARY MANAGEMENT SYSTEM USING CONCEPTS OF DATABASE

A report submitted in partial fulfillment of the requirements

Of

Mini-Project (IS45)

In

**Fourth Semester** 

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# DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING RAMAIAH INSTITUTE OF TECHNOLOGY

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This is to certify that the mini-project work entitled "Library Management System using concepts of Database" is a bonafide work carried out by Komal Raj S bearing USN: 1MS21IS049, Department of ISE, 2023

in partial fulfillment of requirements of Mini-Project (IS65) of Sixth Semester B.E. It is certified that all corrections/suggestions indicated for internal assessment has been incorporated in the report. The mini-project has been approved as it satisfies the academic requirements in respect of mini-project work prescribed by the above said course.

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#### **Abstract**

A Library Management System is a project that tries to create an automated and computerised version for a library so that the daily work of a library can be managed and monitored easily and efficiently. Earlier, the librarian used to manage the whole work in manual mode in the form of files and record books. Also, the process of adding new books, new students, issuing and returning books had to be managed in a manual manner which is very slow and inefficient. The library management system resolves this problem and provide a better solution to this. It provides a user-friendly interface application to the librarian where he can do all the operations of a library very easily. The application mainly consists of three modules which are admin module, librarian module and student module. The admin module will be managed by the system administrator. He manages the overall functioning of the application. The librarian module will be accessed by the librarian. He can perform various operations inside the application such as add new students, new books to the database, issuing and returning of books, updating student's details, book's details, generating weekly/monthly reports etc. The student module can be accessed by the registered students only. The operations that can be performed by the student includes: view all books available in the library, search the availability of a particular book, number of books he has issued, overall fine he has to pay etc. These three modules are interconnected with each other and also with the database. The application is built using Java technology and Sql database.

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#### INTRODUCTION

### 1.1 Background

Traditionally, the librarian managed the whole work in a manual mode or recording the work details in a record book. He has to manage all the work related to library such as issuing books to the students, returning books from the students, maintaining all the details of the books, adding new students, new books etc. on a daily basis. But with the increase in the number of user/students and number of books in a library, this management process has become slow and complex. So, a better management of the library work is required.

The purpose of the library management system is to automate and digitize this traditional way of managing the library work. The Library Management System is much more user-friendly, faster in operation and easy to manage than the manual one. Through the use of it, the librarian can manage the whole data of the library in a single database in different tables with a much more security than the traditional way. In a library, tasks like issue/return/add new students/add new books/ checking any discrepancy in stock, calculating fine for overdue books etc. are performed on a daily basis and suppose a student asks for a particular book from a librarian then he has to search the book manually which takes a lot of time and there are chances of human error in that process as well. But with the help of LMS, the searching of books has become quite easy and fast and the librarian only needs to enter the book id in the search section of the application. Similarly, if a new student has to be added as a registered member of the library or an existing student has to be removed then this process has become very easy to perform. So, all these kinds of operations can be digitized and performed efficiently by using a library management system.

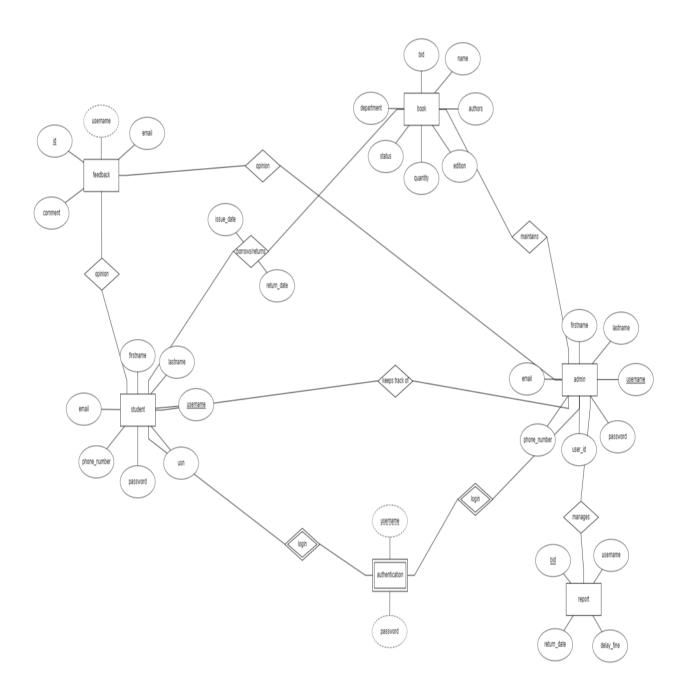
### 1.2 Introduction to project

An online library management system is a practical solution for the existing issues of the traditional library system. It is basically a windows application that is built mainly on Java technology and relational database (sql). The similar application can also be built using the web technologies like HTML, CSS and JavaScript and a corresponding database, that can be a relational database like sql.

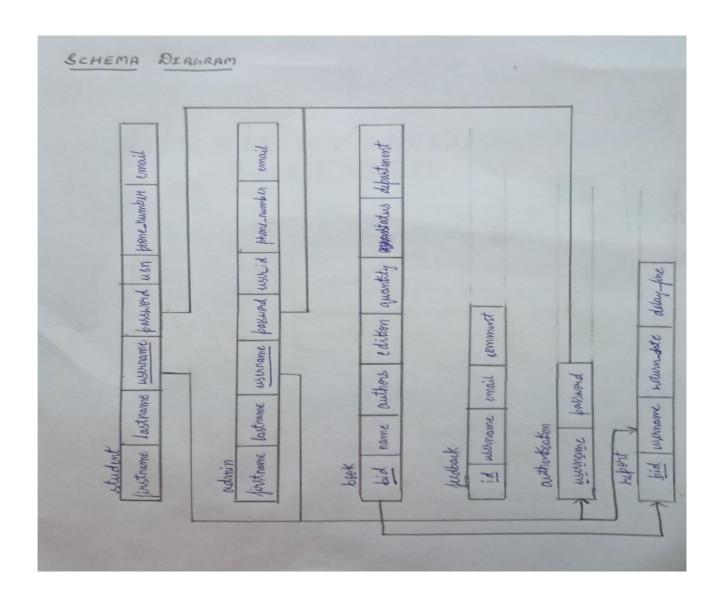
Using this application software, the librarian can search any book by using the issued book id of that particular book in just a second. He can also add new students, new books to the library database, can issue books, return books by making the necessary changes to the database part from the application user-interface. The whole application is divided into different section depending upon its usage.

- 1. Admin Module: The librarian has full access to the admin module. So, whenever a librarian opens the application, he has to login in the application with the user id and password provided. The various actions that he can undertake are visible on the home screen after a successful login. The operations he can perform includes: add new students, add new books, issue books, return books, updating student's details, updating book's details, sending messages to the students regarding various issues (like overdue of the issue book), generating weekly/monthly reports, monitoring any discrepancy in the books stock.
- 2. Student Module: The student module contains details about all the students registered with the library. Only the librarian can register the students with the application after successful verification. The operations that student can perform inside the student module includes: view all books available in the library, search the availability of a particular book, number of books he has issued from the library, overall fine that he has to pay, submit the queries. Apart from this, the students can cancel their registration from the library.

# ER diagram



# **Relational Schema Diagram**



#### **TECHNOLOGY STACK:**

**FRONT END** — HTML, CSS, JavaScript: This basic but powerful combo comprises of HTML (a scripting language) for giving structure to our website, CSS (Cascading Style Sheets) for design, and Javascript for adding functionality.

**BACK END** — PHP: PHP (Hypertext Preprocessor) is known as a general-purpose scripting language that can be used to develop dynamic and interactive websites. It was among the first server-side languages that could be embedded into HTML, making it easier to add functionality to web pages without needing to call external files for data.

**DATABASE** — MySql: MySQL is an open-source relational database management system. For WordPress sites, that means it helps you store all your blog posts, users, plugin information, etc. It stores that information in separate "tables" and connects it with "keys", which is why it's relational.

#### **DISCUSSION OF CODE SEGMENTS**

### **Connection.php**

## admin\_index.php

```
<?php
    session_start();
?>

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Library Management System</title>
    k rel="stylesheet" type="text/css" href="style.css">
```

```
</head>
<body>
 <div class="wrapper">
   <header>
     <div class="logo">
       <img src="images/Ramaiah Institutions Logo.png">
       <h1 style="color: white;">LIBRARY MANAGEMENT SYSTEM</h1>
     </div>
     <?php
       if(isset($_SESSION['login_user']))
       {?>
       <nav>
         <u1>
          <?php echo($ SESSION['login user']); ?> |
          <a href="admin index.php">HOME</a>
          <a href="admin books.php">BOOKS</a>
          <a href="logout.php">LOGOUT</a>
          <a href="student.php">STUDENT INFORMATION</a>
          <a href="admin fine.php">STUDENT FINE</a>
          <a href="admin feedback.php">FEEDBACK</a>
         </nav>
       <?php
       }
       else{?>
         <nav>
         <a href="admin index.php">HOME</a>
          <a href="admin books.php">BOOKS</a>
          <a href="student.php">STUDENT INFORMATION</a>
          <a href="admin fine.php">STUDENT FINE</a>
          <a href="admin_login.php">ADMIN LOGIN</a>
          <a href="admin feedback.php">FEEDBACK</a>
         </nav>
       <?php
     ?>
   </header>
   <section>
     <div class="index section">
```

```
<div class="box">
            <br>><br>>
            <h1 style="text-align: center;font-size: 20px;color:#fbfcfb;">Welcome To The</h1>
            <div class="heading"><h1 style="text-align: center;font-size: 30px;</pre>
font-family:'Times New Roman';color:#fbfcfb;">Advanced Library</h1><br></div>
            <h1 style="text-align: center;font-size: 20px;">Opens at : 9:00 AM</h1><br/>br>
            <h1 style="text-align: center; font-size: 20px;">Closes at : 9:00 PM</h1><br/>br>
         </div>
         </div>
    </section>
    <footer>
    </footer>
  </div>
</body>
</html>
```

### admin\_expire.php

```
<?php
  include "connection.php";
  session start();
?>
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Books</title>
  <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body style="background-color: #0A1828;">
  <div class="wrapper" style="height: 860px;" >
    <header>
      <div class="logo">
         <img src="images/Ramaiah Institutions Logo.png">
         <h1 style="color: white;">LIBRARY MANAGEMENT SYSTEM</h1>
      </div>
      <?php
         if(isset($ SESSION['login user']))
```

```
{?>
        <nav>
          <u1>
            <?php echo($_SESSION['login_user']); ?> |
            <a href="admin index.php">HOME</a>
            <a href="admin books.php">BOOKS</a>
            <a href="logout.php">LOGOUT</a>
            <a href="student.php">STUDENT INFORMATION</a>
            <a href="admin fine.php">STUDENT FINE</a>
            <a href="admin feedback.php">FEEDBACK</a>
          </nav>
        <?php
        }
    </header>
    <div id ="mySidenav"class="sidenav">
        <a href="javascript:void(0)" class="closebtn" onclick="closeNav()">&times;</a>
      <div class="books list"><h1 style="text-align: center; font-size:60px;</pre>
color:darkred;font-family:cursive;">List of books </h1></div>
      <div style="color: white; margin-left: 60px; font-size: 20px;">
        <?php
          if(isset($_SESSION['login_user']))
            echo "Welcome ".$_SESSION['login_user'];
        ?>
      </div>
      <br>><br>>
 <a href="admin books.php"> Books </a>
 <a href="add.php">Add Books </a>
 <a href="admin request.php">Request Information</a>
 <a href="admin issue.php">Issue Information</a>
 <a href="admin expire.php">Expired/Returned List</a>
</div>
<div id="main">
 <span style="font-size:30px;cursor:pointer;color:antiquewhite;"</pre>
onclick="openNav()">☰</span>
```

```
<?php
    if(isset($_SESSION['login_user']))
      $q = mysqli query($db,"SELECT student.username,usn,firstname,
book.bid,name,authors,edition, issue book.issue,return date,approve FROM student INNER JOIN
issue book ON student.username=issue book.username INNER JOIN book ON
book.bid=issue book.bid WHERE issue book.approve!="AND issue book.approve!='Yes'
ORDER BY issue book.return date DESC;");
      if(isset($ POST['submit']))
      {
        $res = mysqli query($db,"SELECT * FROM issue book WHERE
username='$ POST[username]' AND bid = '$ POST[bid]';");
        //$res = mysqli query($db,"SELECT * FROM issue book WHERE
username='$ SESSION[login user]' AND bid = '$ POST[bid]';");
        $var1 = 'Returned';
        mysqli query($db,"UPDATE issue book SET approve = '$var1' WHERE username =
'$ POST[username]' and bid ='$ POST[bid]';");
        mysqli query($db,"UPDATE book SET quantity = quantity+1 WHERE bid =
'$ POST[bid]';");
          $res = mysqli query($db,"SELECT status FROM book WHERE bid =
'$ POST[bid]';");
          while($row=mysqli fetch assoc($res))
            if(\text{srow['status']} == 'Not Available')
              mysqli query($db,"UPDATE book SET status = 'Available' WHERE
bid='$_POST[bid]';");
          }
          $ret = 'Returned';
        $r = mysqli query($db,"SELECT * FROM issue book WHERE
username='$ POST[username]' AND approve = '$ret';");
```

```
day = 0;
        while($row=mysqli fetch assoc($r))
          $d = strtotime($row['return date']);
          $c = strtotime(date("Y-m-d"));
          diff = c+1-d;
          if(diff>0)
            dy = floor(diff/(60*60*24)); //days
          }
        fine = day*1;
        x = date("Y-m-d");
        mysqli query($db,"INSERT INTO fines VALUES
('$ POST[username]','$ POST[usn]','$ POST[bid]','$x','$day','$fine','not paid');");
        $q = mysqli query($db,"SELECT student.username,usn,firstname,
book.bid,name,authors,edition, issue book.issue,return date,approve FROM student INNER JOIN
issue book ON student.username=issue book.username INNER JOIN book ON
book.bid=issue book.bid WHERE issue book.approve!="AND issue book.approve!='Yes'
ORDER BY issue book.return date DESC;");
      if(isset($ POST['submit1']))
        $ret = 'Returned';
        $q = mysqli_query($db,"SELECT student.username,usn,firstname,
book.bid,name,authors,edition, issue book.issue,return date,approve FROM student INNER JOIN
issue book ON student.username=issue book.username INNER JOIN book ON
book.bid=issue book.bid WHERE issue book.approve='$ret' ORDER BY issue book.return date
DESC;");
      }
      if(isset($ POST['submit2']))
        $exp = 'Expired';
        $q = mysqli query($db,"SELECT student.username,usn,firstname,
book.bid,name,authors,edition, issue_book.issue,return_date,approve FROM student INNER JOIN
```

```
issue book ON student.username=issue book.username INNER JOIN book ON
book.bid=issue book.bid WHERE issue book.approve='$exp' ORDER BY
issue book.return date DESC;");
   }
    echo "";
    echo "<tr
style='height:55px;font-size:20px;text-align:centre;border-color:black;background-color:#0049B7;
    echo ""; echo
"Username"; echo "";
    echo ""; echo
"USN"; echo "";
    echo ""; echo
"Name"; echo "";
    echo ""; echo
"Book ID"; echo "";
    echo ""; echo
"Book Name"; echo "";
    echo ""; echo
"Authors"; echo "";
    echo ""; echo
"Edition"; echo "";
    echo ""; echo
"Issue Date"; echo "";
    echo ""; echo
"Return Date"; echo "";
    echo ""; echo
"Status"; echo "";
    echo "";
    echo "";
  }
  else{
   ?><h2 style="text-align:center; font-size:50px;">
    echo "You need to login first!";
    ?></h2>
    <?php
```

}

### books.php

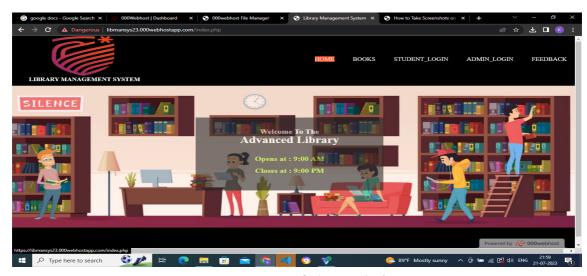
```
<!-- search bar
  <br/>br>
      <div class="srch" style="float:right;padding-right:30px;">
             <form class="navbar-form" method="post" name="form1">
                          <input class="form-control" type="text" name="search"</pre>
placeholder="search books.." required="">
                          <button style="background-color: #6db6b9e6; height:25px;</pre>
width:100px;" type="submit" name="submit" >
        Search
                          </button>
            </form><br>>
           ____request bar______-->
    <form class="navbar-form" method="post" name="form2">
                          <input class="form-control" type="text" name="bid"</pre>
placeholder="Enter the book Id..." required="">
                          <button style="background-color: #6db6b9e6; height:25px;</pre>
width:100px;" type="submit1" name="submit1" >
        Request
                          </button><br>>
             </form>
      </div>
      <?php
      if(isset($ POST['submit']))
        $q=mysqli query($db,"SELECT * from book where name like '%$ POST[search]%' ");
        if(mysqli num rows(q)==0)
```

```
{
    ?>
      <script type = "text/javascript">
       alert('Sorry! No book found. Try searching again');
      // window.location="books.php"
      </script>
      <script type = "text/javascript">
      // alert('Sorry! No book found. Try searching again');
       window.location="books.php"
      </script>
    <?php
    }
    else
      echo "";
      echo "<tr
style='height:55px;font-size:30px;text-align:centre;border-color:black;background-color:#0049B7;
'>'':
      echo ""; echo
"Book ID"; echo "";
      echo ""; echo
"Book Name"; echo "";
      echo ""; echo
"Authors"; echo "";
      echo ""; echo
"Edition"; echo "";
      echo ""; echo
"Status"; echo "";
      echo ""; echo
"Quantity"; echo "";
      echo ""; echo
"Department"; echo "";
      echo "";
      while($row=mysqli fetch assoc($q))
       echo "";
       echo ""; echo
$row['bid']; echo "</tud>";
       echo ""; echo
$row['name']; echo "</tud>";
       echo ""; echo
$row['authors']; echo "</tud>";
```

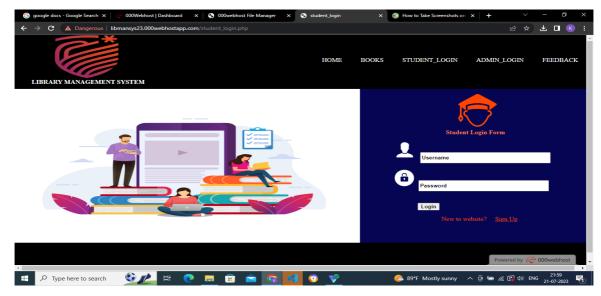
```
echo ""; echo
$row['edition']; echo "</tud>";
          echo ""; echo
$row['status']; echo "</tud>";
          echo ""; echo
$row['quantity']; echo "</tud>";
          echo ""; echo
$row['department']; echo "</tud>";
          echo "";
      echo "";
      if(isset($ POST['submit1']))
        if(isset($ SESSION['login user']))
          $d = "SELECT * FROM book WHERE bid = '$ POST[bid]';";
          $res=mysqli_query($db,$d);
          if($row=mysqli num rows($res))
           mysqli query($db,"INSERT INTO issue book
VALUES('$ SESSION[login user]','$ POST[bid]',",",");");
          <script type="text/javascript">
           alert('Book Requested!');
           window.location = "books.php"
         </script>
          <?php
          }
          else
          {
          ?>
          <script type="text/javascript">
          alert("Book not found!")
          window.location="books.php"
          </script>
          <?php
```

}

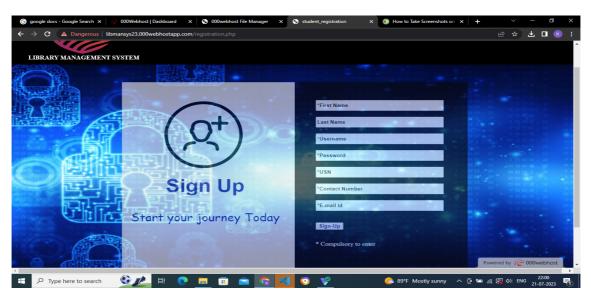
# **Results:**



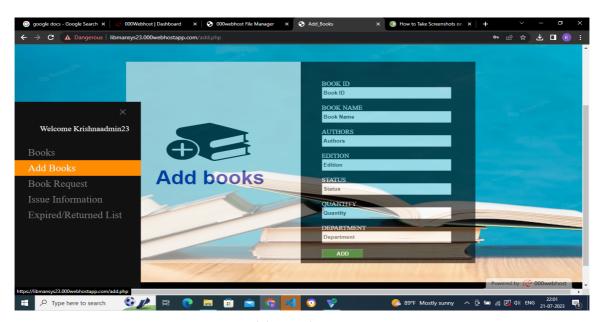
Home page of the website



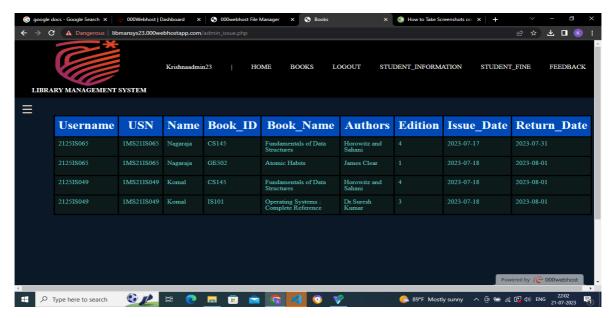
Student login page



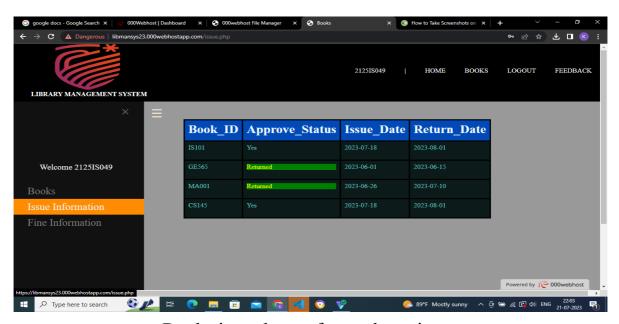
Registration/Sign up page



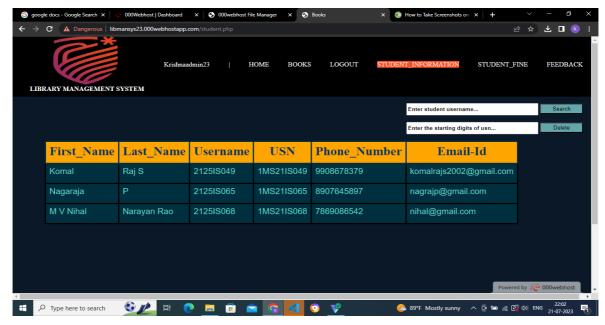
Add Books Page



Page displaying list of books



Books issued page for student view



Student information page in admin view



Student fine information page in admin view

## **Conclusion and Future Scope**

In the future, many more features and facilities can be added to the application. As we know with the increase in number of students, books, complexity other workloads, there can be a need of shifting the library data from the local database to the cloud. So, this software application can be transferred to a cloud database by doing necessary changes to it. With the help of cloud technology, you will get data backup facility, remotely updating and syncing of files, more security of data, lifetime storage etc. Online lectures, previous year examination papers, videos and an assignment submission section are all possible additions. Teachers can shoot the videos of their lectures and upload them on it. A group chat function might be included to the app so that students can share their concerns and doubts which will ultimately makes it more interactive and useful for an academic institution.

# References

- www.apachefriends.org
- www.w3schools.com
- www.php.net
- www.tutorialspoint.com
- <a href="https://hookagency.com">https://hookagency.com</a>
- <a href="https://erdplus.com">https://erdplus.com</a>
- https://000webhostapp.com