To design a library management system using relevant framework, UI design and database.

#### **PROBLEM STATEMENT:-**

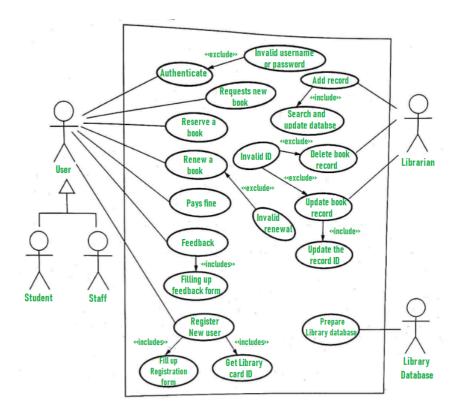
To enable librarians to catalog, classify, and organize materials efficiently, while also providing users with easy access to the library's collection through a user-friendly interface. Here's the basic steps:-

- Book management: Add, remove, and update books.
- Patron management: Add, remove, and update patrons.
- Borrowing/returning books.
- Search functionality.
- Reporting: Generate reports on books borrowed, popular titles, overdue books,

#### **UML USECASE DIAGRAM:-**

#### **Description:-**

The Use Case Diagram for the Library Management System outlines the interactions between the various actors and the system itself. Actors represent different types of users interacting with the system, while use cases represent the functionalities offered by the system.



#### **DOCUMENTATION OF USECASE DIAGRAM:-**

#### Actors:

- Librarian: Manages the library resources, issues books, manages memberships, etc.
- Member: A person registered with the library, can borrow and return books.
- Administrator: Manages system settings, user permissions, etc.

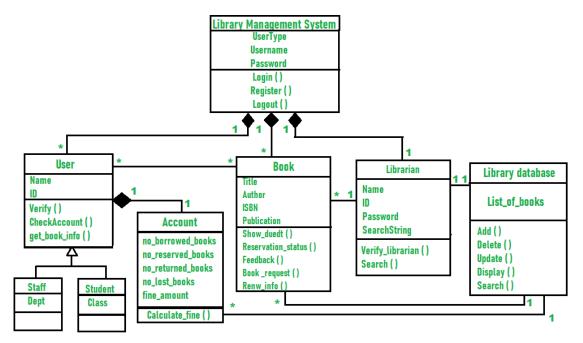
#### **Use Cases:**

- Login: Actors log in to the system.
- Search Catalog: Actors search for books in the library catalog.
- Borrow Book: Members borrow books from the library.
- Return Book: Members return books to the library.
- Manage Book: The Librarian manages book inventory (add, remove, update).
- Generate Report: The administrator generates reports on library activities.
- Manage System Settings: The administrator configures system settings.
- Notify Overdue: The system notifies members of overdue books.

#### **UML CLASS DIAGRAM:-**

#### Description:-

A UML (Unified Modeling Language) class diagram for a library management system would visually represent the structure of the system in terms of classes, their attributes, methods, and the relationships among them.



## **CLASS DIAGRAM FOR LIBRARY MANAGEMENT SYSTEM**

## **DOCUMENTATION OF CLASS DIAGRAM:-**

1. Classes: a. Library:

• Attributes:-

name: string

location: string

Methods:-

addBook(book: Book)

removeBook(book: Book)

• searchBook(title: string): Book

listBooks(): List<Book>

#### b. Book:

Attributes:-

• title: string

• author: string

• ISBN: string

genre: string

availability: boolean

Methods:-

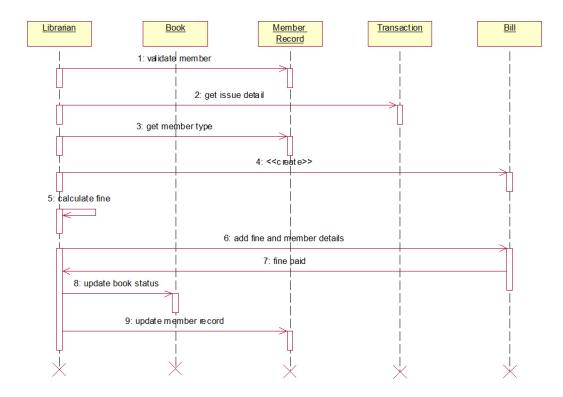
checkOut()

returnBook()

## **UML INTERACTION DIAGRAM:-**

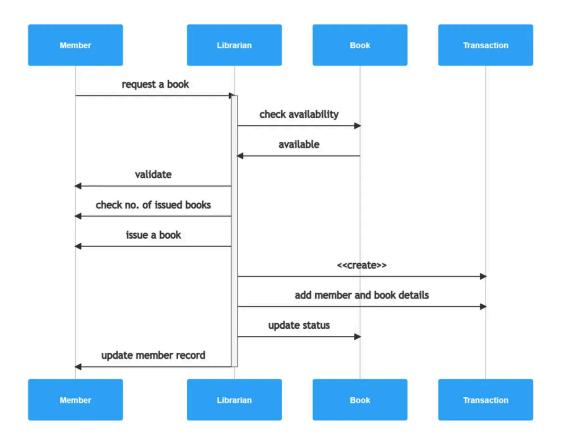
## **Description:-**

A UML interaction diagram, particularly a sequence diagram, for a library management system (LMS) would illustrate the interactions between various components or objects within the system during a specific process or scenario.



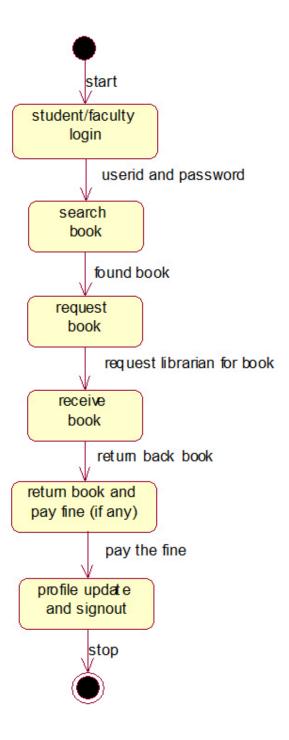
## **UML SEQUENCE DIAGRAM:-**

- 1. Member -> Librarian: Request book checkout
- 2. Librarian -> Catalog: Search for book availability
- 3. Catalog -> Librarian: Confirm book availability
- 4. Librarian -> Member: Confirm checkout
- 5. Member -> Transaction: Initiate checkout
- 6. Transaction -> Book: Update status to check out



## **UML STATECHART DIAGRAM:-**

Creating a UML State Chart diagram for a library management system involves depicting the various states that objects in the system can be in, as well as the transitions between these states.



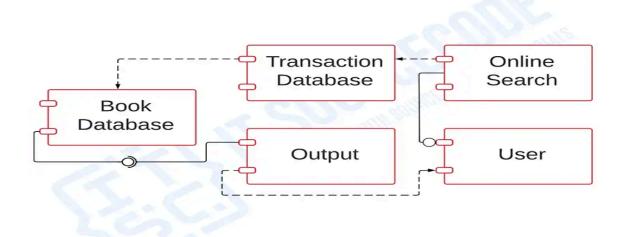
- Initial State: The starting point before any interaction has occurred.
- Idle State: The system is running but no user is logged in.
- Login State: A user is attempting to log in.
- Success Transition: Leads to either the User or Admin state, depending on credentials.
- Failure Transition: Returns to the Idle State.

- User State: A standard user is logged in, with options to search for books, borrow books, and return books.
- Admin State: An admin user is logged in, with additional options to add or remove books, manage user accounts, and view reports.
- Logout State: The user/admin logs out, transitioning back to the Idle State.
- Final State: The endpoint of the system's activity.

## **UML COMPONENT DIAGRAM:-**

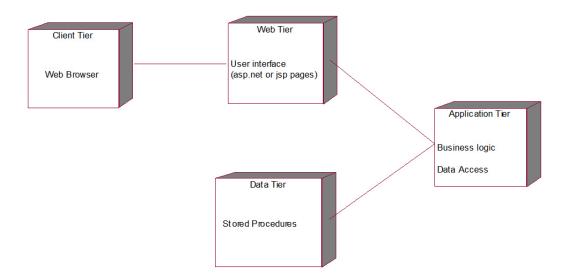
A UML component diagram for a library management system is a structural diagram that shows how the system is divided into components and how those components interact with each other.

LIBRARY MANAGEMENT SYSTEM



COMPONENT DIAGRAM

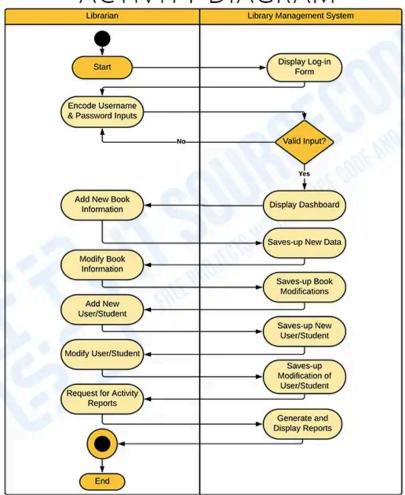
**UML DEPLOYMENT DIAGRAM:-**



## **UML ACTIVITY DIAGRAM:-**

An activity diagram for a library management system would visualize the flow of activities or processes involved in managing the library resources, handling user requests, and maintaining the system's functionality.

# LIBRARY MANAGEMENT SYSTEM ACTIVITY DIAGRAM



## Sample Code:-

## (HTML)index.html:

```
{
             float: right;
             word-spacing: 30px;
             padding: 20px;
      }
      nav li
      {
             display: inline-block;
             line-height: 80px;
      }
</style>
</head>
<body>
      <div class="wrapper">
             <header>
             <div class="logo">
                    <img src="images/9.png">
                    <h1 style="color: white;">ONLINE LIBRARY MANAGEMENT
SYSTEM</h1>
             </div>
                    <nav>
                           <a href="index.html">HOME</a>
                                  <a href="books.html">BOOKS</a>
                                  <a
href="student_login.html">STUDENT-LOGIN</a>
                                  <a href="admin_login.html">ADMIN-LOGIN</a>
                                  <a href="feedback.php">FEEDBACK</a>
                           </nav>
             </header>
             <section>
             <div class="sec_img">
                    <br><br><br>>
                    <div class="box">
                           <h1 style="text-align: center; font-size: 35px;">Welcom to
library</h1><br><br>
                           <h1 style="text-align: center;font-size: 25px;">Opens at: 09:00
</h1><br>
                           <h1 style="text-align: center;font-size: 25px;">Closes at: 15:00
</h1><br>
                    </div>
             </div>
             </section>
             <footer>
```

```
<br><br><
                           Email: Online.library@gmail.com <br>
                           Mobile: +88018******
                    </footer>
       </div>
</body>
</html>
CSS(Style.css):-
.wrapper
{
      height: 660px;
      width: 1350px;
      /*background-color: red;*/
}
header
{
      height: 130px;
       width: 1340px;
      background-color: black;
       padding: 10px;
}
section
{
      height: 550px;
      width: 1361px;
      background-color: grey;
}
footer
      height: 82px;
       width: 1361px;
      background-color: black;
}
.logo
{
      float :left;
      padding-left: 20px;
}
.logo img
```

```
padding-left: 80px;
}
li a
{
       color: white;
       text-decoration: none;
}
nav
{
       float: right;
       word-spacing: 30px;
       padding: 20px;
}
nav li
{
       display: inline-block;
       line-height: 80px;
}
section .sec_img
{
       height: 550px;
       margin-top: 0px;
       background-image: url("images/1.jpg");
}
.box
{
       height: 300px;
       width: 450px;
       background-color: #030002;
       margin: 70px auto;
       opacity: .6;
       color: white;
}
/*----*/
.log_img
       height: 650px;
       margin-top: 0px;
       background-image: url("images/3.jpg");
}
.box1
       height: 350px;
       width: 400px;
```

```
background-color: black;
       margin: 70px auto;
      opacity: .7;
       color: white;
       padding: 20px;
}
form .login
{
       margin: auto 50px;
}
input
      height: 25px;
      width: 300px;
}
/*-----*/
.reg_img
{
      height: 630px;
      margin-top: 0px;
      background-image: url("images/4.png");
}
.box2
{
      height: 589px;
      width: 400px;
      background-color: black;
       margin: 0px auto;
       opacity: .7;
       color: white;
       padding: 20px;
}
Student_login.html:-
<!DOCTYPE html>
<html>
<head>
 <title>Student Login</title>
 k rel="stylesheet" type="text/css" href="style.css">
 <meta charset="utf-8">
 <meta name="viewport" content="width=device-width, initial-scale=1">
```

</head>

```
<body>
<header style="height: 90px;">
<div class="logo">
  <h1 style="color: white; font-size: 25px;word-spacing: 10px; line-height: 80px;margin-top:
20px;">ONLINE LIBRARY MANAGEMENT SYSTEM</h1>
 </div>
  <nav>
   ul>
    <a href="index.html">HOME</a>
    <a href="">BOOKS</a>
    <a href="student_login.html">STUDENT-LOGIN</a>
    <a href="">ADMIN LOGIN</a>
    <a href="">FEEDBACK</a>
   </nav>
</header>
<section>
<div class="log_img">
 <br> <br> <br>>
 <div class="box1">
   <h1 style="text-align: center; font-size: 35px;font-family: Lucida Console;">Library
Management System</h1><br>
   <h1 style="text-align: center; font-size: 25px;">User Login Form</h1><br>
  <form name="login" action="" method="">
   <br><br>>
   <div class="login">
    <input type="text" name="username" placeholder="Username" required=""> <br><br>
    <input type="password" name="password" placeholder="Password" required=""> <br><br>
    <button>Login</button></div>
  </form>
  <a style="color:white;" href="">Forgot password?</a> &nbsp &nbsp &nbsp &nbsp &nbsp
&nbsp &nbsp
   New to this website?<a style="color: white;" href="registration.html">Sign Up</a>
  </div>
</div>
</section>
</body>
</html>
Registration.html:-
<!DOCTYPE html>
```

```
<html>
<head>
<title>Student Registration</title>
k rel="stylesheet" type="text/css" href="style.css">
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1">
</head>
<body>
<header style="height: 90px;">
<div class="logo">
   <h1 style="color: white; font-size: 25px;word-spacing: 10px; line-height: 80px;margin-top:
20px;">ONLINE LIBRARY MANAGEMENT SYSTEM</h1>
  </div>
   <nav>
    <l
     <a href="index.html">HOME</a>
     <a href="">BOOKS</a>
     <a href="student_login.html">STUDENT-LOGIN</a>
     <a href="registration.html">REGISTRATION</a>
     <a href="">FEEDBACK</a>
    </nav>
</header>
<section>
<div class="reg_img">
  <div class="box2">
    <h1 style="text-align: center; font-size: 35px;font-family: Lucida Console;">Library
Management System</h1><br>
    <h1 style="text-align: center; font-size: 25px;">User Registration Form</h1><br>
   <form name="Registration" action="" method="">
    <br><br>>
    <div class="login">
     <input type="text" name="first" placeholder="First Name" required=""> <br>
     <input type="text" name="last" placeholder="Last Name" required=""> <br><br><br><br>
     <input type="text" name="username" placeholder="Username" required="""> <br><br><br>
     <input type="password" name="password" placeholder="Password" required=""> <br><br>
     <input type="text" name="roll" placeholder="Roll No" required=""><br><br><br></ri>
     <input type="text" name="email" placeholder="Email" required=""><br>
     <button>Sign Up</button></div>
```

```
</form>
 </div>
</div>
</section>
</body>
Registration.php:-
<?php
  include "connection.php";
  include "navbar.php";
?>
<!DOCTYPE html>
<html>
<head>
 <title>Student Registration</title>
  <link rel="stylesheet" type="text/css" href="style.css">
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet"</pre>
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min
.css">
src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js">
</script>
    <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.j
s"></script>
  <style type="text/css">
    section
      margin-top: -20px;
  </style>
</head>
<body>
<section>
  <div class="reg img">
    <div class="box2">
        <h1 style="text-align: center; font-size: 35px;font-family:</pre>
Lucida Console;"> &nbsp &nbsp &nbsp Library Management System</h1>
        <h1 style="text-align: center; font-size: 25px;">User
Registration Form</h1>
```

```
<form name="Registration" action="" method="post">
        <div class="login">
          <input class="form-control" type="text" name="first"</pre>
placeholder="First Name" required=""> <br>
          <input class="form-control" type="text" name="last"</pre>
placeholder="Last Name" required=""> <br>
          <input class="form-control" type="text" name="username"</pre>
placeholder="Username" required=""> <br>
          <input class="form-control" type="password" name="password"</pre>
placeholder="Password" required=""> <br>
          <input class="form-control" type="text" name="roll"</pre>
placeholder="Roll No" required=""><br>
          <input class="form-control" type="text" name="email"</pre>
placeholder="Email" required=""><br>
          <input class="form-control" type="text" name="contact"</pre>
placeholder="Phone No" required=""><br>
          <input class="btn btn-default" type="submit" name="submit"</pre>
value="Sign Up" style="color: black; width: 70px; height: 30px"> </div>
      </form>
    </div>
  </div>
</section>
    <?php
      if(isset($ POST['submit']))
        $count=0;
        $sql="SELECT username from `student`";
        $res=mysqli query($db,$sql);
        while($row=mysqli fetch assoc($res))
          if($row['username']==$ POST['username'])
            $count=$count+1;
        }
        if($count==0)
          mysqli_query($db,"INSERT INTO `STUDENT`
VALUES('$_POST[first]', '$_POST[last]', '$_POST[username]',
'$_POST[password]', '$_POST[roll]', '$_POST[email]',
'$ POST[contact]');");
        ?>
          <script type="text/javascript">
           alert("Registration successful");
```

```
</script>
        <?php
        }
        else
        {
          ?>
            <script type="text/javascript">
              alert("The username already exist.");
            </script>
          <?php
        }
      }
    ?>
</body>
</html>
Student_login.php:-
<?php
  include "connection.php";
  include "navbar.php";
?>
<!DOCTYPE html>
<html>
<head>
  <title>Student Login</title>
  <link rel="stylesheet" type="text/css" href="style.css">
  <meta charset="utf-8">
  <meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet"</pre>
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min
.css">
    <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js">
</script>
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.j
s"></script>
  <style type="text/css">
    section
    {
      margin-top: -20px;
```

```
}
  </style>
</head>
<body>
<section>
  <div class="log img">
   <br>
    <div class="box1">
       <h1 style="text-align: center; font-size: 35px;font-family:</pre>
Lucida Console; ">Library Management System</h1>
       <h1 style="text-align: center; font-size: 25px;">User Login
Form</h1><br>
     <form name="login" action="" method="post">
       <div class="login">
         <input class="form-control" type="text" name="username"</pre>
placeholder="Username" required=""> <br>
         <input class="form-control" type="password" name="password"</pre>
placeholder="Password" required=""> <br>
         <input class="btn btn-default" type="submit" name="submit"</pre>
value="Login" style="color: black; width: 70px; height: 30px">
       </div>
     <a style="color:white;" href="">Forgot password?</a> &nbsp
&nbsp &nbsp &nbsp &nbsp &nbsp
       New to this website?<a style="color: white;"
href="registration.html">Sign Up</a>
      </form>
    </div>
  </div>
</section>
  <?php
    if(isset($ POST['submit']))
    {
      $count=0;
      $res=mysqli query($db,"SELECT * FROM `student` WHERE
username='$ POST[username]' && password='$ POST[password]';");
      $count=mysqli_num_rows($res);
      if($count==0)
       ?>
             <!--
             <script type="text/javascript">
               alert("The username and password doesn't match.");
```

```
</script>
            -->
        <div class="alert alert-danger" style="width: 600px;</pre>
margin-left: 370px; background-color: #de1313; color: white">
          <strong>The username and password doesn't match/strong>
       <?php
     }
     else
     {
       ?>
        <script type="text/javascript">
          window.location="index.php"
        </script>
       <?php
     }
   }
 ?>
</body>
</html>
a.php:-
<?php
 include "connection.php";
 include "navbar.php";
<!DOCTYPE html>
<html>
<head>
     <title>Books</title>
</head>
<body>
    <h2>List Of Books</h2>
    <?php
          $res=mysqli query($db,"SELECT * FROM `books` ORDER BY
`books`.`name` ASC;");
          echo "";
               echo "";
                   //Table header
                    echo ">"; echo "ID";
                                             echo "";
                    echo ">"; echo "Book-Name"; echo "";
                    echo ">"; echo "Authors Name"; echo "";
                    echo ""; echo "Edition"; echo "";
                    echo ""; echo "Status"; echo "";
```

```
echo ""; echo "Quantity"; echo "";
                    echo ">"; echo "Department"; echo "";
               echo "";
               while($row=mysqli_fetch_assoc($res))
                    echo "";
                    echo ""; echo $row['bid']; echo "";
                    echo ""; echo $row['name']; echo "";
                    echo ""; echo $row['authors']; echo "";
                    echo ""; echo $row['edition']; echo "";
                    echo ""; echo $row['status']; echo "";
                    echo ""; echo $row['quantity']; echo
"";
                    echo ""; echo $row['department']; echo
"";
                    echo "";
               }
          echo ""
    ?>
</body>
</html>
Connection.php:-
<?php
     $db=mysqli connect("localhost","root","","library");
                         /* server name, username, passwor, database
name */
?>
Books.php:-
<?php
 include "connection.php";
 include "navbar.php";
<!DOCTYPE html>
<html>
<head>
     <title>Books</title>
</head>
<body>
     <h2>List Of Books</h2>
     <?php
```

```
$res=mysqli query($db,"SELECT * FROM `books` ORDER BY
`books`.`name` ASC;");
         echo "";
              echo "";
                  //Table header
                  echo ">"; echo "ID";
                                         echo "";
                  echo ""; echo "Book-Name"; echo "";
                  echo ">"; echo "Authors Name"; echo
"";
                  echo ""; echo "Edition"; echo "";
                  echo ""; echo "Status"; echo "";
                  echo ">"; echo "Quantity"; echo "";
                  echo ">"; echo "Department"; echo "";
              echo "";
             while($row=mysqli fetch assoc($res))
              {
                  echo "";
                  echo ""; echo $row['bid']; echo "";
                  echo ""; echo $row['name']; echo "";
                  echo ""; echo $row['authors']; echo
"";
                  echo ""; echo $row['edition']; echo
"";
                  echo ""; echo $row['status']; echo "";
                  echo ""; echo $row['quantity']; echo
"";
                  echo ""; echo $row['department']; echo
"";
                  echo "";
         echo ""
    ?>
</body>
</html>
<?php
 include "navbar.php";
 include "connection.php";
?>
Feedback.php:-
<!DOCTYPE html>
<html>
<head>
    <title>Feedback</title>
    <link rel="stylesheet" type="text/css" href="style.css">
 <meta charset="utf-8">
```

```
<meta name="viewport" content="width=device-width, initial-scale=1">
    <link rel="stylesheet"</pre>
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.mi
n.css">
    <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js"
></script>
    <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.
js"></script>
    <style type="text/css">
     body
      {
           background-image: url("images/66.jpg");
      }
      .wrapper
           padding: 10px;
           margin: -20px auto;
           width:900px;
           height: 600px;
           background-color: black;
           opacity: .8;
           color: white;
      }
      .form-control
      {
           height: 70px;
           width: 60%;
      .scroll
      {
           width: 100%;
           height: 300px;
           overflow: auto;
      }
    </style>
</head>
<body>
      <div class="wrapper">
           <h4>If you have any suggesions or questions please comment
below.</h4>
           <form style="" action="" method="post">
                 <input class="form-control" type="text"</pre>
name="comment" placeholder="Write something..."><br>
                  <input class="btn btn-default" type="submit"</pre>
name="submit" value="Comment" style="width: 100px; height: 35px;">
```

</form>

```
<br><br><br>>
     <div class="scroll">
           <?php
                 if(isset($_POST['submit']))
                      $sql="INSERT INTO `comments`
VALUES('','$ POST[comment]');";
                      if(mysqli_query($db,$sql))
                            $q="SELECT * FROM `comments` ORDER BY
`comments`.`id` DESC";
                            $res=mysqli_query($db,$q);
                            echo "<table class='table
table-bordered'>";
                            while ($row=mysqli fetch assoc($res))
                                  echo "";
                                       echo ""; echo
$row['comment']; echo "";
                                 echo "";
                      }
                 }
                 else
                      $q="SELECT * FROM `comments` ORDER BY
`comments`.`id` DESC";
                            $res=mysqli_query($db,$q);
                            echo "<table class='table
table-bordered'>";
                            while ($row=mysqli fetch assoc($res))
                                  echo "";
                                       echo ""; echo
$row['comment']; echo "";
                                  echo "";
                            }
                 }
           ?>
     </div>
     </div>
</body>
</html>
```

Footer.html:-

```
<!DOCTYPE html>
<html>
<head>
     <title></title>
      <meta charset="utf-8">
      <meta name="viewport" content="width=device-width,</pre>
initial-scale=1">
      <link rel="stylesheet"</pre>
href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/fo
nt-awesome.min.css">
      <style type="text/css">
      footer
            height: 200px;
            width: 1361px;
           background-color: black;
      }
            .fa
            {
                 margin: 0px 5px;
                 padding: 5px;
                  font-size: 20px;
                  width: 20px;
                 height: 20px;
                  text-align: center;
                  text-decoration: none;
                 border-radius: 50%;
            }
            .fa:hover
                  opacity: .7;
            }
            .fa-facebook
                 background: #3B5998;
                  color: white;
            .fa-twitter
            {
                 background: #55ACEE;
                  color: white;
            .fa-google
            {
                 background: #dd4b39;
                  color: white;
            .fa-instagram
            {
```

```
background: #125688;
                color: white;
           }
           .fa-yahoo
           {
                background: #400297;
                color: white;
     </style>
</head>
<body>
<footer style="background-color: black; ">
     <h3 style="color:white;text-align: center;">Contact us through
social media</h3><br>
     <div style="margin:0px 570px;">
           <a href="#" class="fa fa-facebook"></a>
           <a href="#" class="fa fa-twitter"></a>
           <a href="#" class="fa fa-google"></a>
           <a href="#" class="fa fa-instagram"></a>
           <a href="#" class="fa fa-yahoo"></a>
     </div>
     <br>
     Email: &nbsp Online.library@gmail.com <br><br>
           Mobile: &nbsp &nbsp +880171******
     </footer>
</body>
</html>
navbar.html:-
<!DOCTYPE html>
<html>
<head>
     <title>
     </title>
       <link rel="stylesheet" type="text/css" href="style.css">
       <meta charset="utf-8">
       <meta name="viewport" content="width=device-width,</pre>
initial-scale=1">
```

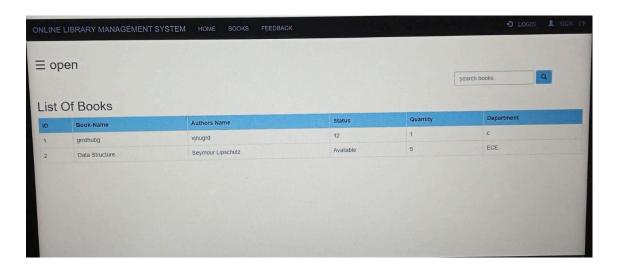
```
<link rel="stylesheet"</pre>
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.mi
n.css">
   <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js"
></script>
   <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.
js"></script>
</head>
<body>
        <nav class="navbar navbar-inverse">
     <div class="container-fluid">
         <div class="navbar-header">
          <a class="navbar-brand active">ONLINE LIBRARY MANAGEMENT
SYSTEM</a>
         </div>
         <a href="index.php">HOME</a>
          <a href="books.php">BOOKS</a>
          <a href="feedback.php">FEEDBACK</a>
         <a href="student login.php"><span class="glyphicon"></a>
glyphicon-log-in"> LOGIN</span></a>
          <a href="student login.php"><span class="glyphicon"></a>
glyphicon-log-out"> LOGOUT</span></a>
          <a href="registration.php"><span class="glyphicon">
glyphicon-user"> SIGN UP</span></a>
        </div>
   </nav>
</body>
</html>
```

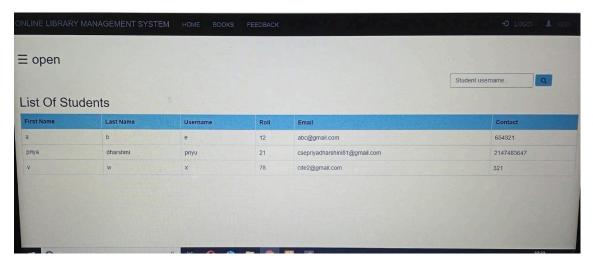
#### **USER INTERFACE LAYER:-**

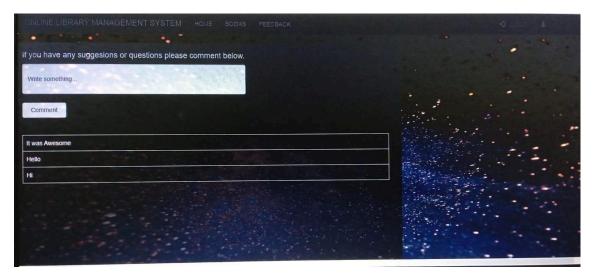












## **RESULT:-**

Thus the library management system was designed using the relevant framework, UI design, and database.