1. Overview & Objectives

In this lab, we will connect a web interface to a database to perform **CRUD** operations. This allows users to interact with data without writing SQL commands manually.

Objectives:

- **C**reate: Insert data into the database via an HTML form.

- **R**ead: Retrieve data and display it on a webpage.

- **U**pdate: Edit existing records.

- **D**elete: Remove records from the database.

Architecture:

- **Frontend:** HTML/CSS forms (User Interface).

- **Backend:** PHP (Server-side logic).

- **Database:** MySQL (Data storage).

2. Prerequisites & Tools

Before starting, ensure you have the following tools installed and running:

1. **XAMPP:** Ensure Apache and MySQL services are running.

2. **Text Editor:** Notepad++, VS Code, or Sublime Text.

3. **Knowledge:** Basic understanding of PHP scripting.

3. Database Setup

We will use the **student** table structure from the previous lab guidelines but add an id column to allow for Edit and Delete operations.

SQL Command: Run this in **phpMyAdmin** (http://localhost/phpmyadmin) inside a database named test1.

```
CREATE TABLE student (
    id INT AUTO_INCREMENT PRIMARY KEY,
    Fname varchar(40),
    Lname varchar(40),
    cgpa double,
    semester int
);
```

4. The Database Connection (db.php)

Purpose: Creates the "bridge" between your website code and the database server.

Code:

```php
<?php
$servername = "localhost";
$username = "root"; // Default XAMPP user
$password = "";    // Default XAMPP password
$dbname = "test1";


// Create connection using Object-Oriented style
$conn = new mysqli($servername, $username, $password, $dbname);


// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error); // Stops script on error
}
?>
```

5. READ: The Homepage & Search (index.php)

Purpose: Fetches data using SELECT and displays it. Includes a Search bar and links to Edit/Delete.

Key Functions:

- mysqli_fetch_array() / fetch_assoc(): Fetches a result row as an array.

Code:

```php
<?php include 'db.php'; ?>

<!DOCTYPE html>
<html>
<head>
    <title>Student List</title>
    <style>
        table { border-collapse: collapse; width: 100%; }
        th, td { border: 1px solid #ddd; padding: 8px; text-align: left; }
        th { background-color: #4CAF50; color: white; } /*  */
    </style>
</head>
<body>

<h2>Student Records</h2>

<form method="GET" action="">
    <input type="text" name="search" placeholder="Search by First Name...">
    <input type="submit" value="Search">
    <a href="index.php">Reset</a>
</form>
```

```
<br>
<a href="create.php">Add New Student</a>
<br><br>


<table>
  <tr>
    <th>ID</th>
    <th>First Name</th>
    <th>Last Name</th>
    <th>CGPA</th>
    <th>Semester</th>
    <th>Actions</th>
  </tr>
  <?php
  // Search Logic
  if (isset($_GET['search'])) {
    $filtervalues = $_GET['search'];
    // Using LIKE for partial matches
    $sql = "SELECT * FROM student WHERE Fname LIKE '%$filtervalues%'";
  } else {
    $sql = "SELECT * FROM student"; // Default: Show all
  }
```

```php
$result = $conn->query($sql);


   if ($result->num_rows > 0) {
     // Loop through results
     while($row = $result->fetch_assoc()) {
        echo "<tr>";
        echo "<td>" . $row['id'] . "</td>";
        echo "<td>" . $row['Fname'] . "</td>"; // Columns from Week 7
        echo "<td>" . $row['Lname'] . "</td>";
        echo "<td>" . $row['cgpa'] . "</td>";
        echo "<td>" . $row['semester'] . "</td>";
        // Action Links
        echo "<td>

            <a href='edit.php?id=" . $row['id'] . "'>Edit</a> |

            <a href='delete.php?id=" . $row['id'] . "' onclick=\"return confirm('Are
you sure?');\">Delete</a>

            </td>";
        echo "</tr>";
     }
   } else {
     echo "<tr><td colspan='6'>No records found</td></tr>";
   }
   ?>
</table>


</body>
</html>
```

6. CREATE: Inserting Data (create.php)

Purpose: An HTML form to collect inputs and PHP logic to INSERT them into the database.

Key Logic:

- Uses $_POST to collect secure data.
- Uses INSERT INTO SQL command.

Code:

```php
<?php include 'db.php'; ?>


<?php
if (isset($_POST['submit'])) { // Checks if button is clicked
    $fname = $_POST['first_name'];
    $lname = $_POST['last_name'];
    $cgpa = $_POST['cgpa'];
    $sem = $_POST['sem'];


    // Insert Query
    $sql = "INSERT INTO student (Fname, Lname, cgpa, semester) VALUES
('$fname', '$lname', '$cgpa', '$sem')";


    if ($conn->query($sql) === TRUE) {
        header("Location: index.php"); // Redirect on success
    } else {
        echo "Error: " . $conn->error;
    }
}
?>
```

```
<!DOCTYPE html>
<html>
<body>
   <h2>Add Student</h2>
   <form method="POST" action="">
      <label>First Name:</label> <input type="text" name="first_name"
required><br>
      <label>Last Name:</label> <input type="text" name="last_name"
required><br>
      <label>CGPA:</label> <input type="text" name="cgpa" required><br>
      <label>Semester:</label> <input type="text" name="sem" required><br>
      <input type="submit" name="submit" value="Submit">
   </form>
</body>
</html>
```

7. UPDATE: Editing Data (edit.php)

Purpose: Loads existing data into a form and updates it using the UPDATE SQL command.

Code:

```
<?php include 'db.php'; ?>


<?php
// Job 1: Fetch existing data
if (isset($_GET['id'])) {
   $id = $_GET['id'];
   $sql = "SELECT * FROM student WHERE id=$id";
   $result = $conn->query($sql);
   $row = $result->fetch_assoc();
}
```

```php
// Job 2: Update data
if (isset($_POST['update'])) {
    $id = $_POST['id']; // Hidden ID
    $fname = $_POST['first_name'];
    $lname = $_POST['last_name'];
    $cgpa = $_POST['cgpa'];
    $sem = $_POST['sem'];
    $sql = "UPDATE student SET Fname='$fname', Lname='$lname', cgpa='$cgpa', semester='$sem' WHERE id=$id"; //
    if ($conn->query($sql) === TRUE) {
        header("Location: index.php");
    } else {
        echo "Error updating record: " . $conn->error;
    }
}
?>
<!DOCTYPE html>
<html>
<body>
    <h2>Edit Student</h2>
    <form method="POST" action="">
        <input type="hidden" name="id" value="<?php echo $row['id']; ?>">
        First Name: <input type="text" name="first_name" value="<?php echo $row['Fname']; ?>"><br>
        Last Name: <input type="text" name="last_name" value="<?php echo $row['Lname']; ?>"><br>
        CGPA: <input type="text" name="cgpa" value="<?php echo $row['cgpa']; ?>"><br>
        Semester: <input type="text" name="sem" value="<?php echo $row['semester']; ?>"><br>
        <input type="submit" name="update" value="Update">
    </form>
</body>
</html>
```

8. DELETE: Removing Data (delete.php)

Purpose: Deletes a specific row based on the ID passed in the URL.

Code:

```php
<?php
include 'db.php';

if (isset($_GET['id'])) { // Get ID from URL
    $id = $_GET['id'];


    // Delete Query
    $sql = "DELETE FROM student WHERE id = $id";


    if ($conn->query($sql) === TRUE) {
        header("Location: index.php");
    } else {
        echo "Error deleting record: " . $conn->error;
    }
}
?>
```