

# **Web Lab 1 (WSL + LAMP Setup and PHP-MySQL Integration)**

**Student:** Towhid

**System:** Windows 10/11 using WSL2 (Ubuntu 24.04 LTS)

**Stack Used:** Apache2, PHP 8.3, MySQL 8.0

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## **1. Introduction**

The objective of this lab was to set up a complete LAMP (Linux, Apache, MySQL, PHP) environment using Windows Subsystem for Linux (WSL).

After setting up Ubuntu inside WSL2, Apache, PHP, and MySQL were installed and configured. Finally, multiple PHP pages were created to test database connection, insertion, listing, and deletion of data.

## **2. Installing WSL and Ubuntu**

### **Step 1 – Install WSL**

Opened PowerShell as Administrator and ran:

```
wsl --install
```

After installation completed, the system was **restarted** as instructed.

### **Step 2 – Fixing WSL Startup Errors**

Initially, Ubuntu showed these errors:

```
WslRegisterDistribution failed with error: 0x80370102
```

```
WslRegisterDistribution failed with error: 0x80080005
```

#### **Fix:**

Entered BIOS (by pressing **F10** at startup) → Enabled **Virtualization (Intel VT-x / AMD-V)**. Then rebooted Windows and WSL started successfully.

```
towhid@DESKTOP-EJC95S2:~/var/www/html
root@DESKTOP-EJC95S2:~# adduser towhid
info: Adding user `towhid' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `towhid' (1000) ...
info: Adding new user `towhid' (1000) with group `towhid (1000)' ...
info: Creating home directory `/home/towhid' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for towhid
Enter the new value, or press ENTER for the default
  Full Name []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n] y
info: Adding new user `towhid' to supplemental / extra groups `users' ...
info: Adding user `towhid' to group `users' ...
root@DESKTOP-EJC95S2:~# usermod -aG sudo towhid
root@DESKTOP-EJC95S2:~# su - towhid
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.6.87.2-microsoft-standard-WSL2 x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

System information as of Sat Nov  8 19:38:20 +06 2025

 System load:  0.17           Processes:          31
 Usage of /:   0.1% of 1006.85GB  Users logged in:    1
 Memory usage: 6%            IPv4 address for eth0: 172.30.92.226
 Swap usage:   0%

This message is shown once a day. To disable it please create the
/home/towhid/.hushlogin file.
towhid@DESKTOP-EJC95S2:~$ sudo apt update && sudo apt upgrade -y
```

### 3. Creating a User in Ubuntu

Once Ubuntu opened, created a new user and added it to sudo group:

**adduser towhid**  
**usermod -aG sudo towhid**  
**su - towhid**

**Confirmed working directory:**

**pwd**

## **Output:**

**/home/towhid**

Then updated packages:

```
sudo apt update && sudo apt upgrade -y
```

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## **4. Installing Apache and Testing**

### **Step 1 – Install Apache**

```
sudo apt install apache2 -y
```

### **Step 2 – Start and Check Apache Status**

```
sudo systemctl start apache2  
sudo systemctl status apache2
```

If Active (running) shows in green, Apache is working.

```
towhid@DESKTOP-EJC95S2:~$ sudo service apache2 start  
towhid@DESKTOP-EJC95S2:~$ sudo service apache2 status  
● apache2.service - The Apache HTTP Server  
  Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)  
  Active: active (running) since Sat 2025-11-08 19:50:05 +06; 1min 30s ago  
    Docs: https://httpd.apache.org/docs/2.4/led  
  Main PID: 8426 (apache2)apache2-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert  
  Tasks: 55 (limit: 7002)-pages.  
  Memory: 5.4M (peak: 6.2M)es-log.| apache2-suexec-custom www-browser ufw  
  CPU: 80msurity.ges will be installed:  
  CGroup: /system.slice/apache2.service-utils libapr1t64 libaprutil1-dbd-sqlite3 libaprutil1-ldap libaprutil1t64 liblua5.4-0 ssl-cert  
       ├─8426 /usr/sbin/apache2 -k startd 2 not upgraded.  
       ├─8428 /usr/sbin/apache2 -k start.target.wants/apache2.service → /usr/lib/systemd/system/apache2.service.  
       ├─8429 /usr/sbin/apache2 -k start.target.wants/apache-htccacheclean.service → /usr/lib/systemd/system/apache-htccacheclean.service.  
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 libapr1t64 amd64 1.7.2-3.1ubuntu0.1 [108 kB]  
Nov 08 19:50:05 DESKTOP-EJC95S2 systemd[1]: Starting apache2.service - The Apache HTTP Server...1.9 kB]  
Nov 08 19:50:05 DESKTOP-EJC95S2 systemd[1]: Started apache2.service - The Apache HTTP Server..1ubuntu7 [11.2 kB]  
towhid@DESKTOP-EJC95S2:~$  
Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 liblua5.4-0 amd64 5.4.6-3build2 [166 kB]  
Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-bin amd64 2.4.58-1ubuntu8.8 [1331 kB]  
Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-data all 2.4.58-1ubuntu8.8 [163 kB]  
Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2-utils amd64 2.4.58-1ubuntu8.8 [97.7 kB]  
Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 apache2 amd64 2.4.58-1ubuntu8.8 [90.2 kB]  
Get:10 http://archive.ubuntu.com/ubuntu noble/main amd64 ssl-cert all 1.1.2ubuntu1 [17.8 kB]  
Fetched 2086 kB in 6s (347 kB/s)  
towhid@DESKTOP-EJC95S2:~$ cd /var/www/html
```

### Step 3 – Test Apache Default Page

Go to:

`http://localhost/`

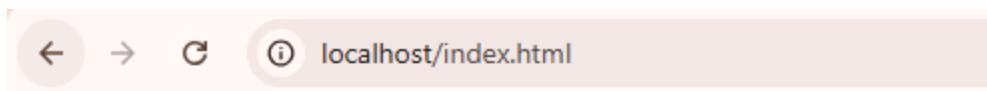


## Hello from Towhid!

This is my first web page using Apache server in WSL Ubuntu.

To create own test page:

```
cd /var/www/html  
echo "Hello from Towhid" | sudo tee index.html
```



## Hello from Towhid!

This is my first web page using Apache server in WSL Ubuntu.

# 5. Installing PHP and Testing PHP Functionality

## Step 1 – Install PHP

```
sudo apt install php libapache2-mod-php -y  
sudo systemctl restart apache2
```

## Step 2 – Create a phpinfo() Test Page

```
echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php
```

Now open in browser:

<http://localhost/info.php>

The screenshot shows a web browser displaying the output of a PHP info script. The page has a header with the URL 'localhost/info.php' and a logo for 'php'. The main content is a table of PHP configuration parameters. Key sections include:

- System:** Linux DESKTOP-EJC96S2 6.6.87-2-microsoft-standard-WSL2 #1 SMP PREEMPT\_DYNAMIC Thu Jun 5 18:30:46 UTC 2025 x86\_64
- Build Date:** Jul 14 2025 18:30:55
- Build System:** Linux
- Server API:** Apache 2.0 Handler
- Virtual Directory Support:** disabled
- Configuration File (php.ini) Path:** /etc/php/8.3/apache2
- Loaded Configuration File:** /etc/php/8.3/apache2/php.ini
- Scan this dir for additional .ini files:** /etc/php/8.3/apache2/conf.d
- Additional ini files parsed:** /etc/php/8.3/apache2/conf.d/10-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-datetime.ini, /etc/php/8.3/apache2/conf.d/20-dom.ini, /etc/php/8.3/apache2/conf.d/20-fileinfo.ini, /etc/php/8.3/apache2/conf.d/20-ftp.ini, /etc/php/8.3/apache2/conf.d/20-gettext.ini, /etc/php/8.3/apache2/conf.d/20-iconv.ini, /etc/php/8.3/apache2/conf.d/20-shar.ini, /etc/php/8.3/apache2/conf.d/20-posix.ini, /etc/php/8.3/apache2/conf.d/20-readline.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.3/apache2/conf.d/20-sysvsem.ini, /etc/php/8.3/apache2/conf.d/20-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini
- PHP API:** 20230831
- PHP Extension:** 20230831
- Zend Extension:** 420230831
- Zend Extension Build:** API\20230831.NTS
- PHP Extension Build:** API\20230831.NTS
- Debug Build:** no
- Thread Safety:** disabled
- Zend Signal Handling:** enabled
- Zend Memory Manager:** enabled
- Zend Multibyte Support:** disabled
- Zend Max Execution Timers:** disabled
- IPv6 Support:** enabled
- DTrace Support:** disabled
- Registered PHP Streams:** https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
- Registered Stream Socket Transports:** tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3
- Registered Stream Filters:** zlib\*, string.rot13, string.toupper, string.tolower, convert\*, consumed, dechunk, convert.iconv\*

At the bottom, a note states: "This program makes use of the Zend Scripting Language Engine: Zend Engine v4.3.6, Copyright (c) Zend Technologies with Zend OPcache v8.3.6, Copyright (c), by Zend Technologies". The word "zendengine" is also visible.

need to enable error display for debugging, open the PHP configuration file:

```
sudo nano /etc/php/8.3/apache2/php.ini
```

Uncomment and set:

```
display_errors = On
```

Then save and exit (Ctrl + O → Enter → Ctrl + X).

---

## 6. Installing MySQL and Setting Up Database

### Step 1 – Install MySQL Server

```
sudo apt install mysql-server -y
```

### Step 2 – Start and Check MySQL

```
sudo systemctl start mysql
sudo systemctl status mysql
```

### Step 3 – Log into MySQL

```
sudo mysql
```

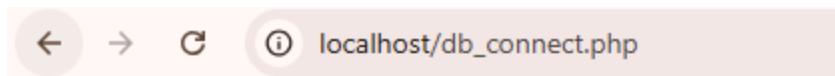
### Step 4 – Create Database and Table

```
CREATE DATABASE web_lab;
USE web_lab;

CREATE TABLE students (
    id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(50),
    email VARCHAR(50)
);

INSERT INTO students (name, email)
```

```
VALUES ('Towhid', 'towhid@example.com'),  
       ('Rafi', 'rafi@example.com');
```



### Student Records

ID	Name	Email
1	Towhid	towhid@example.com
2	Rafi	rafi@example.com

## 7. Enabling PHP-MySQL Integration

If see an error like Class 'mysqli' not found, install the PHP MySQL module:

```
sudo apt install php8.3-mysql -y  
sudo systemctl restart apache2
```

### Step 2 – Create a New MySQL User

Since the root account can cause permission issues, create a new user:

```
CREATE USER 'towhid'@'localhost' IDENTIFIED BY '12345';  
GRANT ALL PRIVILEGES ON web_lab.* TO 'towhid'@'localhost';  
FLUSH PRIVILEGES;  
EXIT;
```

---

## 8. Creating PHP Pages

All pages are stored in /var/www/html.

## a) index.php

Main homepage linking to all other files.

```
<?php  
echo "<h2>Web Lab – Towhid</h2>" ;  
echo "<p><a href='db_connect.php'>Test DB Connection</a></p>" ;  
echo "<p><a href='add_student.php'>Add Student</a></p>" ;  
echo "<p><a href='list_students.php'>List Students</a></p>" ;  
?>
```



## Web Lab – Towhid

[Test DB Connection](#)

[Add Student](#)

[List Students](#)

## b) db\_connect.php

Displays database connection and student list.

```
<?php  
$servername = "localhost";  
$username = "towhid";  
$password = "12345";  
$database = "web_lab";
```

```

$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
echo "<h2>Connected successfully to MySQL database!</h2>";
$sql = "SELECT * FROM students";
$result = $conn->query($sql);

if ($result && $result->num_rows > 0) {
    echo "<h3>Student Records</h3>";
    echo "<table border='1' cellpadding='6'><tr><th>ID</th><th>Name</th><th>Email</th></tr>";
    while ($row = $result->fetch_assoc()) {
        echo
"<tr><td>".$row['id']."</td><td>".$row['name']."</td><td>".$row['email']
'']."</td></tr>";
    }
    echo "</table>";
} else {
    echo "No data found!";
}
$conn->close();
?>

```

← → ⌂ localhost/db\_connect.php

# Connected successfully to MySQL database!

## Student Records

ID	Name	Email
1	Towhid	towhid@example.com
2	Rafi	rafi@example.com

### c) add\_student.php

Form to add new students.

```
<?php
$servername = "localhost";
$username   = "towhid";
$password   = "12345";
$database   = "web_lab";
$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) { die("Connection failed: " .
$conn->connect_error); }

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $name  = trim($_POST['name'] ?? '');
    $email = trim($_POST['email'] ?? '');
    if ($name !== '' && $email !== '') {
        $stmt = $conn->prepare("INSERT INTO students (name, email)
VALUES (?, ?)");
        $stmt->bind_param("ss", $name, $email);
        $stmt->execute();
        echo "Student added successfully! <a
href='list_students.php'>View list</a>";
        $stmt->close();
        $conn->close();
        exit;
    } else {
        echo "Name and Email required!";
    }
}
?>
<h2>Add Student</h2>
<form method="post">
    <label>Name: <input type="text" name="name"></label><br><br>
    <label>Email: <input type="email" name="email"></label><br><br>
    <button type="submit">Save</button>
</form>
```



## Add Student

Name:

Email:

**Save**

[Back to list](#)

### d) list\_students.php

Displays and allows deletion of students.

```
<?php
$servername = "localhost";
$username   = "towhid";
$password   = "12345";
$database   = "web_lab";
$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) { die("Connection failed: " .
$conn->connect_error); }

if (isset($_GET['delete'])) {
    $id = (int) $_GET['delete'];
    $conn->query("DELETE FROM students WHERE id=$id");
    header("Location: list_students.php");
    exit;
}

$result = $conn->query("SELECT * FROM students ORDER BY id");
```

```

?>
<h2>Student List</h2>
<table border="1" cellpadding="6">
<tr><th>ID</th><th>Name</th><th>Email</th><th>Action</th></tr>
<?php
if ($result && $result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
        echo "<tr>";
        echo "<td>".$row['id']."</td>";
        echo "<td>".$row['name']."</td>";
        echo "<td>".$row['email']."</td>";
        echo "<td><a href='list_students.php?delete=".$row['id']."' onclick='return confirm(\"Delete?\");'>Delete</a></td>";
        echo "</tr>";
    }
} else {
    echo "<tr><td colspan='4'>No data</td></tr>";
}
?>
</table>
<p><a href="add_student.php">Add new</a></p>
<?php $conn->close(); ?>
```

## 9. Restarting Services

Whenever configuration changes are made:

```

sudo systemctl restart apache2
sudo systemctl restart mysql
```



→



localhost/list\_students.php

## Student Records

[Add New](#) | [Home](#)

ID	Name	Email	Action
1	Towhid	towhid@example.com	<a href="#">Delete</a>
2	Rafi	rafi@example.com	<a href="#">Delete</a>
3	zahid	zahid@gmail.com	<a href="#">Delete</a>
4	tamjid	tamjid@gmail.com	<a href="#">Delete</a>
5	yasin	yasin@gmial.com	<a href="#">Delete</a>
6	mridul	mridul@gmail.com	<a href="#">Delete</a>