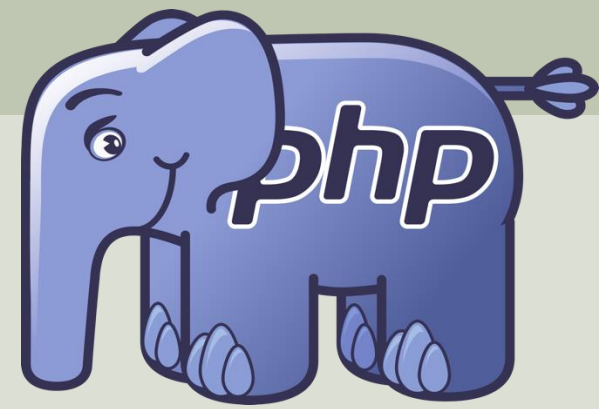


<https://www.halvorsen.blog>



PHP Overview

Hans-Petter Halvorsen



Contents

- Introduction
- PHP
- PHP and MySQL
 - phpMyAdmin

<https://www.halvorsen.blog>

Introduction



Hans-Petter Halvorsen

[Table of Contents](#)

Web Development Frameworks

For static web pages you can use HTML only, but for more dynamic and interactive web pages you typically need to use a server-side framework/language.

Some of the most used server-side (backend) Web Development Frameworks/languages are:

- **PHP** (Scripting language for Web development)
- **ASP.NET** (Microsoft, Visual Studio, C#)
- **Ruby on Rails** (Ruby)
- **Django** (Python)

You also need to use such frameworks to communicate and present data from a database on your web pages.

How PHP Works

Client-side

Web Browser



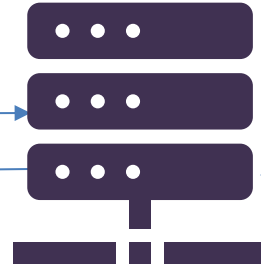
Request

Internet

HTML, CSS, JavaScript

Server-side

Web Server

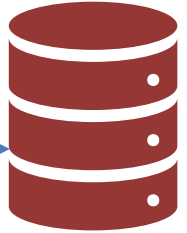


Response

PHP

Apache (example of
Web Server software)

Database



e.g., MySQL

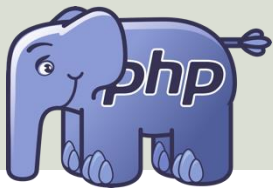
PHP Files are executed on the server and the result (HTML) is sent to the client.

PHP

- PHP is a **server scripting language** for making dynamic and interactive web pages.
- PHP is the most widely used server-side programming language for web development. More than 70%? of the world's web pages use PHP in one form or another. PHP scripts are executed on the server/webserver.
- PHP files have extension ".php" and are typically a mix of PHP, HTML, CSS and JavaScript
- PHP is free and open-source.
- With PHP you can easily typically. communicate with a Database, and especially MySQL.
- LAMP: Linux, Apache, MySQL and PHP.
- PHP is widely used and still by far the most used/popular language for web development.
- PHP is easy to learn (but still very powerful) – which cannot be said on many other web technologies and programming languages.
- Homepage: <https://www.php.net>

PHP vs ASP.NET

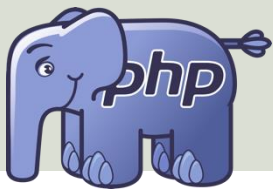
- PHP is open-source and free to use.
- With ASP.NET you are locked and forced into Microsoft technology and tools.
- PHP works on various platforms and supports most web servers.
- ASP.NET can have a steeper learning curve for beginners.
- PHP is embedded within the HTML code, making web development easier.
- Hosting is very easy with PHP with lots of providers.
- ASP.NET is based on C#, .NET and Visual Studio, so if you already know these tools, then you are well on your way.



MySQL and PHP



- MySQL is a popular relational database system.
- It is free and open source.
- MySQL uses SQL (Structured Query Language)
- The combination of PHP and MySQL is very popular.
- You can create powerful web applications where you can show, save, update and delete data in a MySQL database from the PHP code.



PHP + MySQL



- You need to have a **PHP + MySQL** Environment on your local computer or get access to it from a server/Internet or use a provider.
- For local installation you need to download and install Apache, PHP and MySQL.
- You can get server access from many providers (free or paid).
- I use an internal **LAMP** server available for employees and students at my University.

LAMP

- LAMP = **L**inux, **A**pache, **M**ySQL, **P**HP
 - PHP is the Programming Language
 - MySQL is the Database System
 - Apache is the Web Server software
 - Linux is the operating system where the Web Server is running

Each part in LAMP is free and open-source, so it is a popular web hosting environment. You find also lots of online documentation and a large community.

LAMP/PHP Web Hosting

- There exists hundreds/thousands of different LAMP/PHP/MySQL Hosting Providers, some free but mostly paid options.
- Hostinger - <https://www.hostinger.no>
- InfinityFree - <https://www.infinityfree.com>
- PRO ISP - <https://www.proisp.no>
- +++ (Just Google)

XAMPP

- XAMPP is a popular PHP development environment
- It works on Windows, macOS and Linux
- It installs Apache, MariaDB and PHP
 - Apache is a Web Server
 - MariaDB is almost identical to MySQL
 - PHP is the Web Programming language
- <https://www.apachefriends.org>

<https://www.halvorsen.blog>

PHP

[Table of Contents](#)

Hans-Petter Halvorsen



Getting Started

- We need **web server with PHP installed**
 - You can setup your own server with PHP, but I will just use an existing webserver with PHP in this tutorial.
- We need a Code Editor like **Visual Studio Code**.
- We need an **FTP** program like **WinSCP** to transfer files from local PC to the webserver

PHP Code Editors

You can use any kind of tool/IDE for Python(Django development). Here are some recommendations:

- **Visual Studio Code.**
 - Multiplatform and Free.
 - Homepage: <https://code.visualstudio.com>
- **PhpStorm.**
 - Free 30-day full trial.
 - Free access to all JetBrains IDEs for students and educators!
 - Homepage: <https://www.jetbrains.com>
- +++

Basic PHP Example

PHP code embedded within the HTML code

```
<!DOCTYPE html>
<html>
  <body>
    <h1>Hello World</h1>
    <?php
      $name ="Hans-Petter Halvorsen";

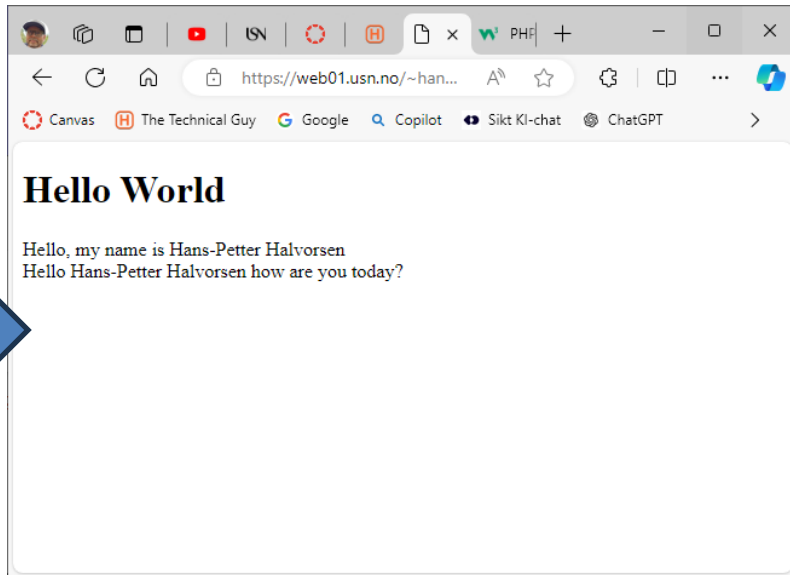
      echo "Hello, my name is $name";

      echo "<br>";

      echo 'Hello ' . $name . ' how are you today?';
    ?>
  </body>
</html>
```



Web Browser



client-side

Server-side

Basic PHP Example

You need to use the .php file extension

PHP is embedded within the HTML code:

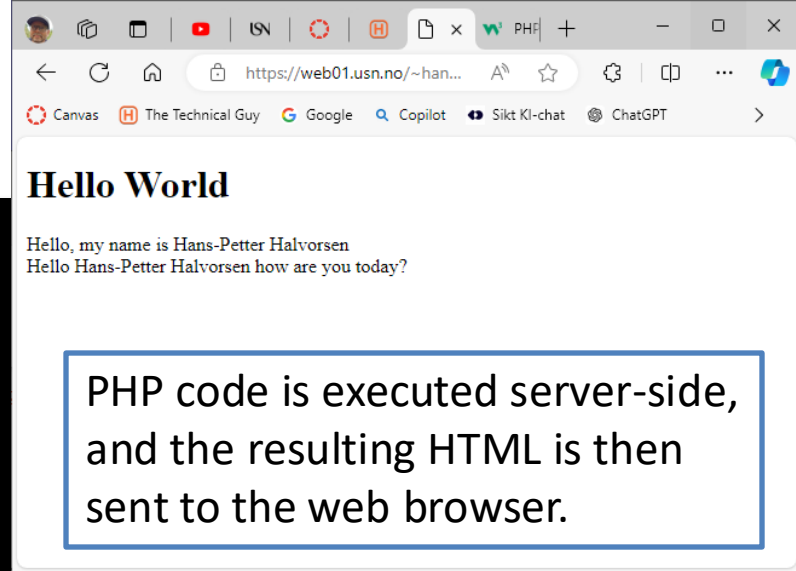
```
<!DOCTYPE html>
<html>
  <body>
    <h1>Hello World</h1>
    <?php
      $name = "Hans-Petter Halvorsen";

      echo "Hello, my name is $name";

      echo "<br>";

      echo 'Hello ' . $name . ' how are you today?';
    ?>
  </body>
</html>
```

Variables in PHP
starts with \$



PHP code is executed server-side,
and the resulting HTML is then
sent to the web browser.

This is result seen in
the web browser

“**echo**” is a built-in function in PHP that is much used
to output contents of a variable to the web browser

```
File Edit Selection View Go Run Terminal Help
index.php x
C: > Users > hansha > OneDrive > Courses > Webutvikling > Tutorials > PHP > Development > HelloWorld > index.php
1 <!DOCTYPE html>
2 <html>
3   <body>
4     <h1>Hello World</h1>
5     <?php
6       $name = "Hans-Petter Halvorsen";
7
8       echo "Hello, my name is $name";
9
10      echo "<br>";
11
12      echo 'Hello ' . $name . ' how are you today?';
13    ?>
14  </body>
15 </html>
```

1

PHP code server-side

Result shown in the Web Browser

3

Hello World

Hello, my name is Hans-Petter Halvorsen
Hello Hans-Petter Halvorsen how are you today?

```
Line wrap
1 <!DOCTYPE html>
2 <html>
3   <body>
4     <h1>Hello World</h1>
5     Hello, my name is Hans-Petter Halvorsen<br>Hello Hans-Petter Halvorsen how are you today?
6   </body>
7 </html>
```

2

Generated HTML File that is sent to the Client (Web Browser)

- Back Alt+Left arrow
- Refresh Ctrl+R
- Save as Ctrl+S
- Print Ctrl+P
- Send tab to your devices
- Create QR Code for this page
- Read aloud Ctrl+Shift+U
- Translate to English
- Open in sidebar
- Add page to Collections
- Share
- Screenshot Ctrl+Shift+S
- View page source Ctrl+U
- Inspect

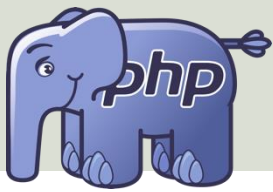
<https://www.halvorsen.blog>

PHP + MySQL



Hans-Petter Halvorsen

[Table of Contents](#)

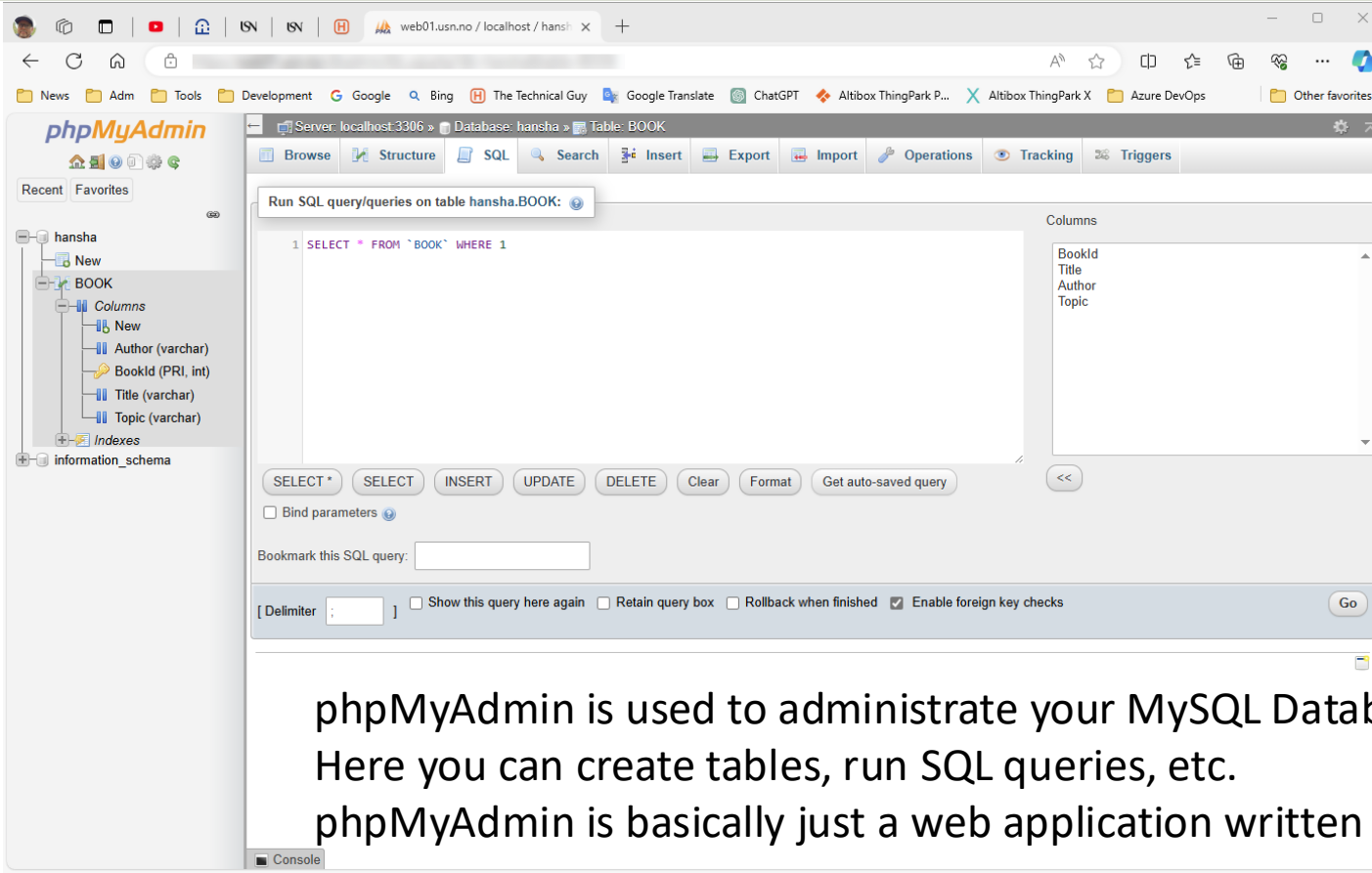


MySQL and PHP



- MySQL is a popular relational database system.
- It is free and open source.
- MySQL uses SQL (Structured Query Language)
- The combination of PHP and MySQL is very popular.
- You can create powerful web applications where you can show, save, update and delete data in a MySQL database from the PHP code.

phpMyAdmin



The screenshot displays the phpMyAdmin web interface in a browser window. The address bar shows the URL `web01.usn.no / localhost / hansha`. The interface includes a navigation sidebar on the left with a tree view showing the database structure: `hansha` (parent), `New` (child), `BOOK` (child), `Columns` (child of `BOOK`), `Indexes` (child of `BOOK`), and `information_schema` (parent). The `Columns` list includes `New`, `Author (varchar)`, `BookId (PRI, int)`, `Title (varchar)`, and `Topic (varchar)`.

The main content area is titled "Run SQL query/queries on table hansha.BOOK:". It features a toolbar with buttons for `Browse`, `Structure`, `SQL`, `Search`, `Insert`, `Export`, `Import`, `Operations`, `Tracking`, and `Triggers`. Below the toolbar is a text area containing the SQL query: `1 SELECT * FROM `BOOK` WHERE 1`. To the right of the query area is a "Columns" list showing `BookId`, `Title`, `Author`, and `Topic`.

Below the query area are several buttons: `SELECT *`, `SELECT`, `INSERT`, `UPDATE`, `DELETE`, `Clear`, `Format`, and `Get auto-saved query`. There is also a checkbox for `Bind parameters`. Below these buttons is a "Bookmark this SQL query:" field. At the bottom, there is a "Delimiter" field set to `:`, a `Show this query here again` checkbox, a `Retain query box` checkbox, a `Rollback when finished` checkbox, a checked `Enable foreign key checks` checkbox, and a `Go` button.

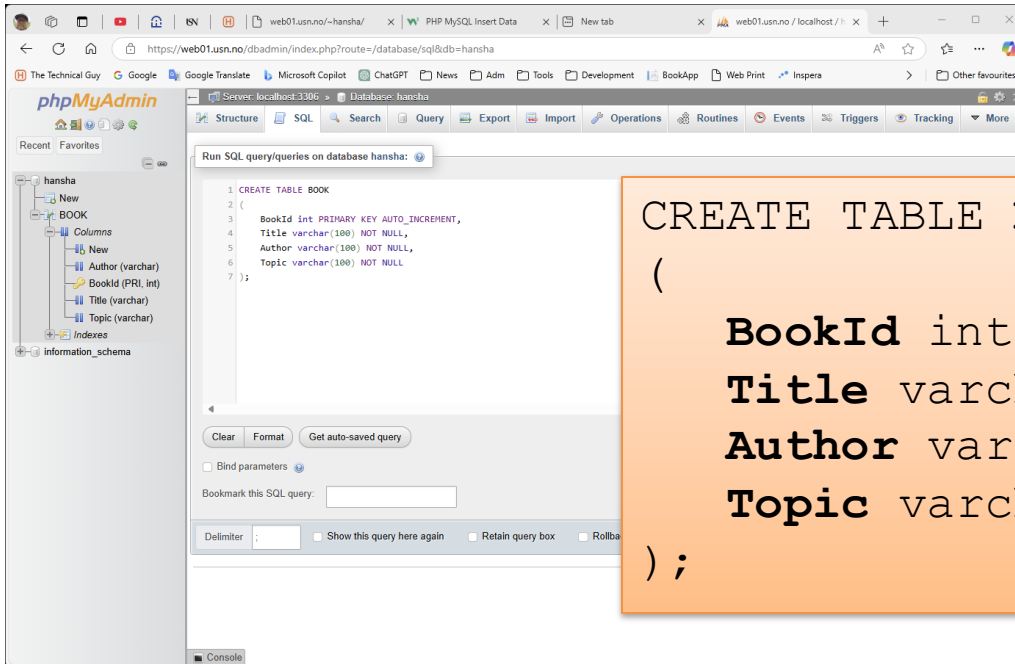
At the bottom of the interface, there is a "Console" tab.

phpMyAdmin is used to administrate your MySQL Database.
Here you can create tables, run SQL queries, etc.

phpMyAdmin is basically just a web application written in PHP.

Create Database

We can create Databases and Database Tables using PHP. But typically, we create a Database and the necessary Tables in advance before we start coding the Web Application. We use the phpMyAdmin tool.



```
CREATE TABLE BOOK
(
  BookId int PRIMARY KEY AUTO_INCREMENT,
  Title varchar(100) NOT NULL,
  Author varchar(100) NOT NULL,
  Topic varchar(100) NOT NULL
);
```

Open Connection to DB

In this tutorial we will use MySQLi. Here you see an example how we can connect to the database:

```
<?php
$servername = "localhost";
$dbname = "dbname";
$username = "username";
$password = "password";

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);

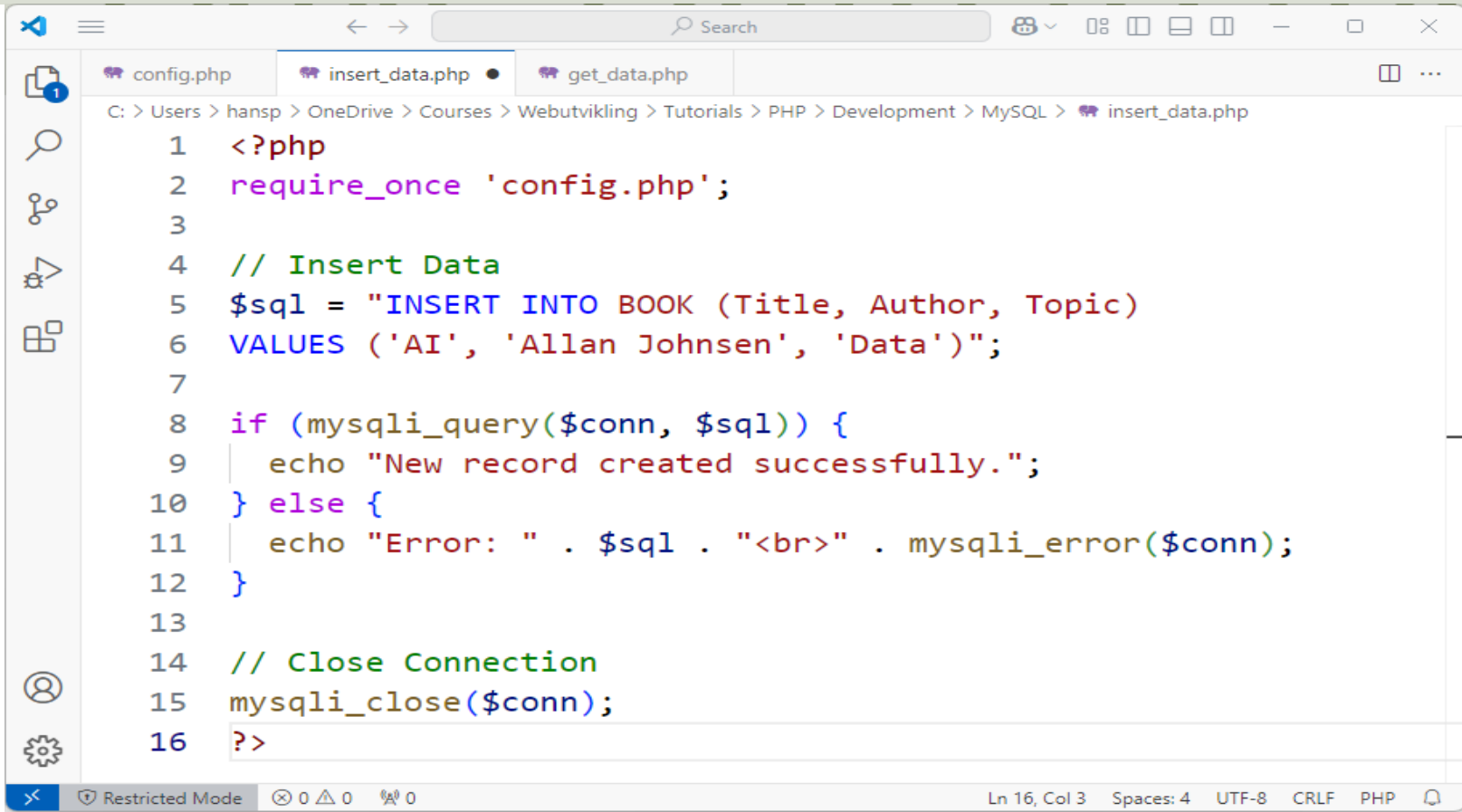
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}
echo "Connected successfully.";
?>
```

If you have many PHP that communicates with a Database, you can put this code into a separate PHP file, e.g., "config.php" or "database.php" that you use in your files, see next page for an example.

Close Connection after we have communicated with the database:

```
mysqli_close($conn);
```

Save Data to the Database



The image shows a code editor window with the following content:

```
1 <?php
2 require_once 'config.php';
3
4 // Insert Data
5 $sql = "INSERT INTO BOOK (Title, Author, Topic)
6 VALUES ('AI', 'Allan Johnsen', 'Data')";
7
8 if (mysqli_query($conn, $sql)) {
9     echo "New record created successfully.";
10 } else {
11     echo "Error: " . $sql . "<br>" . mysqli_error($conn);
12 }
13
14 // Close Connection
15 mysqli_close($conn);
16 ?>
```

The code editor interface includes a search bar at the top, a file explorer on the left, and a status bar at the bottom. The status bar shows "Restricted Mode", "0 0 0", "Ln 16, Col 3", "Spaces: 4", "UTF-8", "CRLF", "PHP", and a search icon.

Show Data from the Database

The image shows a code editor window with a PHP script named `get_data.php`. The script connects to a MySQL database, queries a table named `BOOK` for all records, and displays the results in a formatted list. The browser window shows the output of the script, which is a list of four books with their IDs, titles, authors, and topics.

```
1 <?php
2 require_once 'config.php';
3
4 // Get Data from Database
5 $sql = "SELECT BookId, Title, Author, Topic FROM BOOK";
6 $result = mysqli_query($conn, $sql);
7
8 if (mysqli_num_rows($result) > 0) {
9     // output data of each row
10    while($row = mysqli_fetch_assoc($result)) {
11        echo "BookId: " . $row["BookId"]. " - Title: " . $row["Title"]. " - Author: " . $row["Author"]. " - Topic: " . $row["Topic"];
12    }
13 } else {
14     echo "0 results";
15 }
16
17 // Close Connection
18 mysqli_close($conn);
19 ?>
```

Browser Output:

```
Connected successfully:
BookId: 1 - Title: Web Apps - Author: Elvis Presly - Topic: Programming
BookId: 2 - Title: IoT and Cloud - Author: John Wayne - Topic: IoT
BookId: 3 - Title: C# - Author: Rune Hansen - Topic: Programming
BookId: 4 - Title: AI - Author: Allan Johnsen - Topic: Data
```

Resources and References

- PHP Homepage: <https://www.php.net>
- PHP Tutorial:
<https://www.w3schools.com/php>
- MySQL Tutorial:
<https://www.w3schools.com/mysql>

Books Web Application

Books

Here you find a list of available books:

BookId	Title	Author	Topic	Action
1	Web Apps	Elvis Presly	Programming	Update Book Delete Book
2	IoT and Cloud	John Wayne	IoT	Update Book Delete Book
3	C#	Rune Hansen	Programming	Update Book Delete Book
4	AI	Allan Johnsen	Data	Update Book Delete Book

[New Book](#)

New Book

Please enter book information:

Title:

Author:

Topic:

[Save](#)

Update Book

Please enter book information:

Title:

Web Apps

Author:

Elvis Presly

Topic:

Programming

[Save](#)

Here you see an example of a PHP Web Application with CRUD functionality. CRUD means Create, Read, Update and Delete. This means our Web Application retrieve data, insert data, update data and delete data from a MySQL database.

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