

Multimedia im Netz
Online Multimedia
Winter semester 2015/16

Tutorial 04 – Major Subject



Today's Agenda

- Repetition:
 - Sessions: Powerpoint Karaoke
 - Discussion of Assignment 03
- Database access through PHP & MySQL
- Break Out: Music Library Management app
- Quiz

PHP Sessions: Powerpoint Karoake

Sessions with PHP

- Sessions need to be started before any output occurs
- Create session ID cookie:
`session_start()`
- Delete the session ID cookie:
`session_destroy()`
- Read / write session values:
 - superglobal `$_SESSION` array
 - immediately reset session like this `$_SESSION = array();`

Example: Counting visits

```
<?php session_start(); ?>
<!DOCTYPE html>
<html>
[... ]
<body>

<?php
if(!isset($_SESSION['count'])) {
    $_SESSION['count'] = 1;
}
else {
    $_SESSION['count']++;
}

echo '<p>Current count: ' . $_SESSION['count'] . '</p>';

?>
</body></html>
```

Example: Destroying Sessions

```
<?php session_start(); ?>
<!DOCTYPE html>
<html>
[... ]
<body>
<?php
if(isset($_POST['destroy'])) {
    session_destroy();
    $_SESSION = array();
}

if(!isset($_SESSION['count'])) {
    $_SESSION['count'] = 1;
}
else {
    $_SESSION['count']++;
}

echo '<p>Current count: ' . $_SESSION['count'] . '</p>';
?>
<form method="post">
    <input type="submit" name="destroy" value="Reset"/>
</form>
</body>
</html>
```

Codebreaker

You have 7 remaining guesses.

A B C D ● ● ○ ○

A B C E ● ● ● ○

A B F E ● ● ● ●

[Restart](#)

You won.
The code was: A B F E

Persistent Data Storage: PHP & MySQL

PHP & MySQL

- Multiple functions and APIs available for PHP to work with databases:
 - mysql („Deprecated“ since PHP 5.5.0)
 - **mysqli** (i is for „improved“)
 - PDO (PHP Data Objects)
- „mysql“ is still supported for older PHP versions
- It is highly recommendable to use mysqli or PDO

MySQL at the CIP-Pool

- Access “Datenbank Management” here:
<https://tools.rz.ifi.lmu.de/>
- Create a new account (required)
- Create a new database (required)
- Connect to db2.cip.ifi.lmu.de

Test Connection

```
<?php
    $c = mysql_connect("localhost", "user", "password");

    if($c){
        echo "Connection to database has been established.";
    } else {
        echo "Could not connect to database";
    }
?>
```

Mysqli

- i stands for “improved”
- Offers two interfaces
 - Procedural (traditional)
 - Object-oriented (see lecture slides)
- Supports...:
 - „prepared“ statements
 - multiple statements within one query
 - transactions
- Improved debugging tools

Mysqli (procedural)

- Establish connection
`$c = mysqli_connect("localhost", "user", "password", "mydb");`
- Select database
`mysqli_select_db($c, "mydb");`
- Close connection
`mysqli_close($c);`
- PHP statement for MySQL query
`$results = mysqli_query($c, $query);`
- Process the results:
`mysqli_fetch_array($results);`
`mysqli_fetch_array($results, MYSQLI_NUM);`
`mysqli_fetch_array($results, MYSQLI_ASSOC);`

Mysqli (object oriented)

- Establish connection

```
$c = new mysqli("host", "user", "password", "db");
```

- PHP statement for MySQL query

```
$results = $c->query($query);
```

- Process the results

```
$results->fetch_assoc();  
$results->fetch_row();
```

```
$results->fetch_all(MYSQLI_BOTH);  
$results->fetch_all(MYSQLI_ASSOC);  
$results->fetch_all(MYSQLI_NUM);
```

- Close the connection

```
$c->close();
```

Mysqli: Prepared Statements (I)

- Separate structure and data through the use of wildcards. In the query we use „?“ as wildcards
- **Advantages:**
 - You can **reuse** the query with different parameters
 - More **secure** (cf. SQL Injections)
- **How to do it:**
 - „Prepare“: Prepare the query. The template is checked for errors an.
 - „Bind“: Bind the parameters to the wildcards
 - „Execute“: The query is executed with the passes parameters

Mysqli: Prepared Statements (II)

- Query with wildcards

```
$query = "SELECT lastName FROM people WHERE firstName=?";
```

- Create the statement

```
$statement = $c->prepare($query);
```

- Bind the parameters

```
$name = "Sam";  
$statement->bind_param("s", $name);
```

- Execute the query

```
$statement->execute();
```


Mysqli: Prepared Statements (III)

- Bind result columns to variables
`$statement->bind_result($lastNameResults);`
- Fetch results
`$statement->fetch();`

Example: Prepared Statements

```
<?php
include_once('connectionInfo.php');
$c = new mysqli($host,$user,$password,$db);
$query = "SELECT lastName FROM people WHERE firstName=?";
$stmt = $c->prepare($query);
$name = "Sam";
$stmt->bind_param("s", $name);
$stmt->execute();
$stmt->bind_result($lastNameResults);
while($stmt->fetch()){
    print_r($lastNameResults);
    echo "<br />";
}
```

Password Hashing in PHP (I)

- PHP has built-in password hashing functions
 - `password_hash()`
 - `password_verify()`
 - ...
- Don't store plain text passwords in databases. Ever ;)
- Advantages of `password_hash()` and `password_verify()`:
 - More secure
 - Easy to use
- Disadvantages:
 - only available with PHP \geq 5.5.0

Password Hashing in PHP (II)

- Hashing a password:

```
$pwHash = password_hash("password1234", PASSWORD_DEFAULT);
```

- Verifying a hash:

```
if (password_verify("password1234", $pwHash)) {  
    echo "Your password is correct";  
}
```

Break-Out Task

- Create a music library management tool
- Allow users to create artist & album entries
- There is a code skeleton on GitHub:

<https://github.com/MIMUC-MMN/tutorials-15-16/tree/master/tutorial04/breakout>

ID	Artist	Title
1	The Rolling Stones	Exile on Main Street
2	Beatles	Help!
3	Red Hot Chili Peppers	Californication
4	Rage Against the Machine	The Battle of Los Angeles

Album Artist: Album Title:

After an insert...

The album was successfully inserted into the database

ID	Artist	Title
1	The Rolling Stones	Exile on Main Street

Album Artist:

Album Title:

Add Album

If you have time...

- Allow deleting the entries
- Avoid duplicates
- Create additional optional fields for runtime, track count, buying link etc.

Round-up Quiz

1. Name an advantage of mysqli over the deprecated mysql.
2. What does `mysqli->fetch_assoc()` do?
3. Why is it recommendable to call `mysqli->close`?
4. What is an advantage of prepared statements?
5. What are the steps of working with prepared statements?

Thanks!

What are your questions?

Let's begin with the Assignment!

- Download the assignment sheet
- Start with task 1
- You can collaborate with your neighbor
- Turn in the assignment by November 9th, 12:00 noon via UniWorX