CSE479
Web Programming

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Topic 7

PHP and MySQL

What is MySQL?

- **MySQL is a database system used on the web**

- **MySQL is a database system that runs on a server**

- **MySQL is ideal for both small and large applications**

- **MySQL is very fast, reliable, and easy to use**

- **MySQL uses standard SQL**

- **MySQL compiles on a number of platforms**

- **MySQL is free to download and use**

- **MySQL is developed, distributed, and supported by Oracle Corporation**

PHP and MySQL

- **PHP combined with MySQL are cross-platform (you can develop in Windows and serve on a Unix platform)**

- **A query is a question or a request. We can query a database for specific information and have a record set returned.**
  SAMPLE: SELECT LastName FROM Employees

- **If you don't have a PHP server with a MySQL Database, you can download it for free here: http://www.mysql.com**

PHP connect to MySQL

PHP 5 and later can work with a MySQL database using:

MySQLi extension (the "i" stands for improved)
PDO (PHP Data Objects)

Earlier versions of PHP used the MySQL extension. However, this extension was deprecated in 2012.

Should I Use MySQLi or PDO?

If you need a short answer, it would be "Whatever you like".

Both MySQLi and PDO have their advantages:

PDO will work on 12 different database systems, whereas MySQLi will only work with MySQL databases. So, if you have to switch your project to use another database, PDO makes the process easy. You only have to change the connection string and a few queries. With MySQLi, you will need to rewrite the entire code - queries included.

Both are object-oriented, but MySQLi also offers a procedural API.

Both support Prepared Statements. Prepared Statements protect from SQL injection, and are very important for web application security.

MySQLi and PDO INSTALLATION

- MySQL

For Linux and Windows: The MySQLi extension is automatically installed in most cases, when php5 mysql package is installed.
For installation details, go to: http://php.net/manual/en/mysqli.installation.php

- PDO

For installation details, go to: http://php.net/manual/en/pdo.installation.php

Open a Connection to MySQL (1)

Example (MySQLi Object-Oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password);

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

Example (MySQLi Procedural)

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

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

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

Open a Connection to MySQL (2)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=myDB", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
    echo "Connected successfully";
    }
catch(PDOException $e)
    {
    echo "Connection failed: " . $e->getMessage();
    }
?>
```

Close the Connection

Example (MySQLi Object-Oriented)

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

Example (MySQLi Procedural)

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

Example (PDO)

```
$conn = null;
```

PHP Create a MySQL Database (1)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// Create database
$sql = "CREATE DATABASE myDB";
if ($conn->query($sql) === TRUE) {
    echo "Database created successfully";
} else {
    echo "Error creating database: " . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

// Create database
$sql = "CREATE DATABASE myDB";
if (mysqli_query($conn, $sql)) {
    echo "Database created successfully";
} else {
    echo "Error creating database: " . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Create a **MySQL** Database (2)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
    $sql = "CREATE DATABASE myDBPDO";
    // use exec() because no results are returned
    $conn->exec($sql);
    echo "Database created successfully<br>";
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Create MySQL Tables (1)

Create a MySQL Table Using MySQLi and PDO

```
CREATE TABLE MyGuests (
id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
firstname VARCHAR(30) NOT NULL,
lastname VARCHAR(30) NOT NULL,
email VARCHAR(50),
reg_date TIMESTAMP
)
```

Notes on the table:

- NOT NULL - Each row must contain a value for that column, null values are not allowed
- DEFAULT value - Set a default value that is added when no other value is passed
- UNSIGNED - Used for number types, limits the stored data to positive numbers and zero
- AUTO INCREMENT - MySQL automatically increases the value of the field by 1 each time a new record is added
- PRIMARY KEY - Used to uniquely identify the rows in a table. The column with PRIMARY KEY setting is often an ID number, and is often used with AUTO_INCREMENT

PHP Create MySQL Tables (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// sql to create table
$sql = "CREATE TABLE MyGuests (
id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
firstname VARCHAR(30) NOT NULL,
lastname VARCHAR(30) NOT NULL,
email VARCHAR(50),
reg_date TIMESTAMP
)";

if ($conn->query($sql) === TRUE) {
    echo "Table MyGuests created successfully";
} else {
    echo "Error creating table: " . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

// sql to create table
$sql = "CREATE TABLE MyGuests (
id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
firstname VARCHAR(30) NOT NULL,
lastname VARCHAR(30) NOT NULL,
email VARCHAR(50),
reg_date TIMESTAMP
)";

if (mysqli_query($conn, $sql)) {
    echo "Table MyGuests created successfully";
} else {
    echo "Error creating table: " . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Create MySQL Tables (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    // sql to create table
    $sql = "CREATE TABLE MyGuests (
    id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
    firstname VARCHAR(30) NOT NULL,
    lastname VARCHAR(30) NOT NULL,
    email VARCHAR(50),
    reg_date TIMESTAMP
    )";

    // use exec() because no results are returned
    $conn->exec($sql);
    echo "Table MyGuests created successfully";
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Insert Data Into MySQL (1)

Insert Data Into MySQL Using MySQLi and PDO

After a database and a table have been created, we can start adding data in them.
Here are some syntax rules to follow:
- The SQL query must be quoted in PHP
- String values inside the SQL query must be quoted
- Numeric values must not be quoted

The word NULL must not be quoted

The INSERT INTO statement is used to add new records to a MySQL table:

INSERT INTO table_name (column1, column2, column3,...)
VALUES (value1, value2, value3,...)

PHP Insert Data Into MySQL (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com')";

if ($conn->query($sql) === TRUE) {
    echo "New record created successfully";
} else {
    echo "Error: " . $sql . "<br>" . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com')";

if (mysqli_query($conn, $sql)) {
    echo "New record created successfully";
} else {
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Insert Data Into MySQL (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
    $sql = "INSERT INTO MyGuests (firstname, lastname, email)
    VALUES ('John', 'Doe', 'john@example.com')";
    // use exec() because no results are returned
    $conn->exec($sql);
    echo "New record created successfully";
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Get ID of Last Inserted Record (1)

Get ID of The Last Inserted Record

If we perform an INSERT or UPDATE on a table with an AUTO_INCREMENT field, we can get the ID of the last inserted/updated record immediately.

In the table "MyGuests", the "id" column is an AUTO_INCREMENT field:

```
CREATE TABLE MyGuests (
id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
firstname VARCHAR(30) NOT NULL,
lastname VARCHAR(30) NOT NULL,
email VARCHAR(50),
reg_date TIMESTAMP
)
```

PHP Get ID of Last Inserted Record (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com')";

if ($conn->query($sql) === TRUE) {
    $last_id = $conn->insert_id;
    echo "New record created successfully. Last inserted ID is: " . $last_id;
} else {
    echo "Error: " . $sql . "<br>" . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com')";

if (mysqli_query($conn, $sql)) {
    $last_id = mysqli_insert_id($conn);
    echo "New record created successfully. Last inserted ID is: " . $last_id;
} else {
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Get ID of Last Inserted Record (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
    $sql = "INSERT INTO MyGuests (firstname, lastname, email)
    VALUES ('John', 'Doe', 'john@example.com')";
    // use exec() because no results are returned
    $conn->exec($sql);
    $last_id = $conn->lastInsertId();
    echo "New record created successfully. Last inserted ID is: " . $last_id;
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Insert Multiple Records Into MySQL (1)

Insert Multiple Records Into MySQL Using MySQLi and PDO

Multiple SQL statements must be executed with the `mysqli_multi_query()` function.

PHP Insert Multiple Records Into MySQL (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com');";
$sql .= "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('Mary', 'Moe', 'mary@example.com');";
$sql .= "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('Julie', 'Dooley', 'julie@example.com')";

if ($conn->multi_query($sql) === TRUE) {
    echo "New records created successfully";
} else {
    echo "Error: " . $sql . "<br>" . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$sql = "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('John', 'Doe', 'john@example.com');";
$sql .= "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('Mary', 'Moe', 'mary@example.com');";
$sql .= "INSERT INTO MyGuests (firstname, lastname, email)
VALUES ('Julie', 'Dooley', 'julie@example.com')";

if (mysqli_multi_query($conn, $sql)) {
    echo "New records created successfully";
} else {
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Insert Multiple Records Into MySQL (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    // begin the transaction
    $conn->beginTransaction();
    // our SQL statements
    $conn->exec("INSERT INTO MyGuests (firstname, lastname, email)
    VALUES ('John', 'Doe', 'john@example.com')");
    $conn->exec("INSERT INTO MyGuests (firstname, lastname, email)
    VALUES ('Mary', 'Moe', 'mary@example.com')");
    $conn->exec("INSERT INTO MyGuests (firstname, lastname, email)
    VALUES ('Julie', 'Dooley', 'julie@example.com')");

    // commit the transaction
    $conn->commit();
    echo "New records created successfully";
    }
catch(PDOException $e)
    {
    // roll back the transaction if something failed
    $conn->rollback();
    echo "Error: " . $e->getMessage();
    }

$conn = null;
?>
```

PHP Prepared Statements (1)

Prepared Statements and Bound Parameters

A prepared statement is a feature used to execute the same (or similar) SQL statements repeatedly with high efficiency. Prepared statements basically work like this:

- Prepare: An SQL statement template is created and sent to the database. Certain values are left unspecified, called parameters (labeled "?"). Example: INSERT INTO MyGuests VALUES(?, ?, ?)
- The database parses, compiles, and performs query optimization on the SQL statement template, and stores the result without executing it
- Execute: At a later time, the application binds the values to the parameters, and the database executes the statement. The application may execute the statement as many times as it wants with different values

Compared to executing SQL statements directly, prepared statements have three main advantages:

- Prepared statements reduce parsing time as the preparation on the query is done only once (although the statement is executed multiple times)
- Bound parameters minimize bandwidth to the server as you need send only the parameters each time, and not the whole query
- Prepared statements are very useful against SQL injections, because parameter values, which are transmitted later using a different protocol, need not be correctly escaped. If the original statement template is not derived from external input, SQL injection cannot occur.

PHP Prepared Statements (2)

Example (MySQLi with Prepared Statements)

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

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

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// prepare and bind
$stmt = $conn->prepare("INSERT INTO MyGuests (firstname, lastname, email) VALUES (?, ?, ?)");
$stmt->bind_param("sss", $firstname, $lastname, $email);

// set parameters and execute
$firstname = "John";
$lastname = "Doe";
$email = "john@example.com";
$stmt->execute();

$firstname = "Mary";
$lastname = "Moe";
$email = "mary@example.com";
$stmt->execute();

$firstname = "Julie";
$lastname = "Dooley";
$email = "julie@example.com";
$stmt->execute();

echo "New records created successfully";

$stmt->close();
$conn->close();
?>
```

PHP Prepared Statements (3)

Code lines to explain from the example above:
"INSERT INTO MyGuests (firstname, lastname, email) VALUES (?, ?, ?)"

In our SQL, we insert a question mark (?) where we want to substitute in an integer, string, double or blob value.
Then, have a look at the bind_param() function:

```
$stmt->bind_param("sss", $firstname, $lastname, $email);
```

This function binds the parameters to the SQL query and tells the database what the parameters are. The "sss" argument lists the types of data that the parameters are. The s character tells mysql that the parameter is a string.
The argument may be one of four types:
- i - integer
- d - double
- s - string
- b - BLOB

We must have one of these for each parameter.
By telling mysql what type of data to expect, we minimize the risk of SQL injections.

PHP Prepared Statements (4)

Example (PDO with Prepared Statements)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    // prepare sql and bind parameters
    $stmt = $conn->prepare("INSERT INTO MyGuests (firstname, lastname, email)
    VALUES (:firstname, :lastname, :email)");
    $stmt->bindParam(':firstname', $firstname);
    $stmt->bindParam(':lastname', $lastname);
    $stmt->bindParam(':email', $email);

    // insert a row
    $firstname = "John";
    $lastname = "Doe";
    $email = "john@example.com";
    $stmt->execute();

    // insert another row
    $firstname = "Mary";
    $lastname = "Moe";
    $email = "mary@example.com";
    $stmt->execute();

    // insert another row
    $firstname = "Julie";
    $lastname = "Dooley";
    $email = "julie@example.com";
    $stmt->execute();

    echo "New records created successfully";
    }
catch(PDOException $e)
    {
    echo "Error: " . $e->getMessage();
    }
$conn = null;
?>
```

PHP Select Data From MySQL (1)

Select Data From a MySQL Database

The SELECT statement is used to select data from one or more tables:

SELECT column_name(s) FROM table_name

or we can use the * character to select ALL columns from a table:

SELECT * FROM table_name

PHP Select Data From MySQL (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$sql = "SELECT id, firstname, lastname FROM MyGuests";
$result = mysqli_query($conn, $sql);

if (mysqli_num_rows($result) > 0) {
    // output data of each row
    while($row = mysqli_fetch_assoc($result)) {
        echo "id: " . $row["id"]. " - Name: " . $row["firstname"]. " " . $row["lastname"]
    }
} else {
    echo "0 results";
}

mysqli_close($conn);
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "SELECT id, firstname, lastname FROM MyGuests";
$result = $conn->query($sql);

if ($result->num_rows > 0) {
    echo "<table><tr><th>ID</th><th>Name</th></tr>";
    // output data of each row
    while($row = $result->fetch_assoc()) {
        echo "<tr><td>".$row["id"]."</td><td>".$row["firstname"]." ".$row["lastname"]."</td></tr>";
    }
    echo "</table>";
} else {
    echo "0 results";
}
$conn->close();
?>
```

PHP Delete Data From MySQL (1)

Delete Data From a MySQL Table Using MySQLi and PDO

The DELETE statement is used to delete records from a table:

    DELETE FROM table_name
    WHERE some_column = some_value

Let's look at the "MyGuests" table:

id	firstname	lastname	email	reg_date
1	John	Doe	john@example.com	2014-10-22 14:26:15
2	Mary	Moe	mary@example.com	2014-10-23 10:22:30
3	Julie	Dooley	julie@example.com	2014-10-26 10:48:23

PHP Delete Data From MySQL (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

// sql to delete a record
$sql = "DELETE FROM MyGuests WHERE id=3";

if ($conn->query($sql) === TRUE) {
    echo "Record deleted successfully";
} else {
    echo "Error deleting record: " . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

// sql to delete a record
$sql = "DELETE FROM MyGuests WHERE id=3";

if (mysqli_query($conn, $sql)) {
    echo "Record deleted successfully";
} else {
    echo "Error deleting record: " . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Delete Data From MySQL (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    // sql to delete a record
    $sql = "DELETE FROM MyGuests WHERE id=3";

    // use exec() because no results are returned
    $conn->exec($sql);
    echo "Record deleted successfully";
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Update Data in MySQL (1)

Update Data In a MySQL Table Using MySQLi and PDO

The UPDATE statement is used to update existing records in a table:

```
UPDATE table_name
SET column1=value, column2=value2,...
WHERE some_column=some_value
```

Let's look at the "MyGuests" table:

id	firstname	lastname	email	reg_date
1	John	Doe	john@example.com	2014-10-22 14:26:15
2	Mary	Moe	mary@example.com	2014-10-23 10:22:30

PHP Update Data in MySQL (2)

Example (MySQLi Object-oriented)

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

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}

$sql = "UPDATE MyGuests SET lastname='Doe' WHERE id=2";

if ($conn->query($sql) === TRUE) {
    echo "Record updated successfully";
} else {
    echo "Error updating record: " . $conn->error;
}

$conn->close();
?>
```

Example (MySQLi Procedural)

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

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);
// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

$sql = "UPDATE MyGuests SET lastname='Doe' WHERE id=2";

if (mysqli_query($conn, $sql)) {
    echo "Record updated successfully";
} else {
    echo "Error updating record: " . mysqli_error($conn);
}

mysqli_close($conn);
?>
```

PHP Delete Data From MySQL (3)

Example (PDO)

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

try {
    $conn = new PDO("mysql:host=$servername;dbname=$dbname", $username, $password);
    // set the PDO error mode to exception
    $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

    $sql = "UPDATE MyGuests SET lastname='Doe' WHERE id=2";

    // Prepare statement
    $stmt = $conn->prepare($sql);

    // execute the query
    $stmt->execute();

    // echo a message to say the UPDATE succeeded
    echo $stmt->rowCount() . " records UPDATED successfully";
    }
catch(PDOException $e)
    {
    echo $sql . "<br>" . $e->getMessage();
    }

$conn = null;
?>
```

PHP Limit Data Selections From MySQL

Limit Data Selections From a MySQL Database

MySQL provides a LIMIT clause that is used to specify the number of records to return.
The LIMIT clause makes it easy to code multi page results or pagination with SQL, and is very useful on large tables.
Returning a large number of records can impact on performance.

Assume we wish to select all records from 1 - 30 (inclusive) from a table called "Orders". The SQL query would then look like this:

        $sql = "SELECT * FROM Orders LIMIT 30";

When the SQL query above is run, it will return the first 30 records.
What if we want to select records 16 - 25 (inclusive)?
Mysql also provides a way to handle this: by using OFFSET.

The SQL query below says "return only 10 records, start on record 16 (OFFSET 15)":
        $sql = "SELECT * FROM Orders LIMIT 10 OFFSET 15";

You could also use a shorter syntax to achieve the same result:
        $sql = "SELECT * FROM Orders LIMIT 15, 10";