PHP and MySQL Introduction

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Dept. of Computer Science
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Lecture Outline

1. MySQL Database
2. MySQL installation
3. PHP & MySQL connection
4. MySQLi vs PDO
5. Create DB and Tables
6. Insert data to Tables

MySQL

What is MySQL

- MySQL is a database management system that allows you to manage relational databases (RDBMS).
- It is open source software backed by Oracle.
- MySQL is easy to master in comparison with other database software like Oracle Database, or Microsoft SQL Server.
- MySQL can run on various platforms UNIX, Linux, Windows, etc.
- It is most noted for its quick processing, proven reliability, ease and flexibility of use.

Why MySQL

- MySQL is an essential part of almost every open source PHP application.
- PHP combined with MySQL are cross-platform.
- Popular examples for PHP & MySQL-based scripts are WordPress, Joomla, Magento and Drupal.
- MySQL is the standard database system for web sites with enormous volumes of both data and end-users.

MySQLi vs PDO

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 and was deprecated in 2012.

MySQLi vs PDO

Both MySQLi and PDO have their advantages:

- PDO will work on different database systems, whereas MySQLi will only work with MySQL databases.
- Switching project to use another database with PDO is easy.
- With MySQLi, 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.
- A great benefit of PDO is that it has exception class to handle any problems that may occur in our database queries.

MySQLi Object-oriented vs MySQLi Procedural

The MySQLi extension features a dual interface.

- procedural
- object-oriented programming

Users migrating from the old MySQL extension may prefer the procedural interface.

- The procedural interface is similar to that of the old MySQL extension.
- the function names differ only by prefix.
- There are no significant performance differences between the two interfaces.

MySQLi Object-oriented

CREATE DATABASE Example

```
<?php
$servername = "localhost";
$username = “root";
$password = "";
// Create connection
$conn = new mysqli($servername, $username, $password); //MySQLi connection object
// Check connection
if ($conn->connect_error) {
   die("Connection failed: " . $conn->connect_error);
}
// Create database
$sql = "CREATE DATABASE myDB"; //query string
if ($conn->query($sql) === TRUE) {//query execute
   echo "Database created successfully";
} else {
   echo "Error creating database: " . $conn->error;
}
$conn->close();// close MySQLi connection object
?>
```

MySQLi Procedural

CREATE DATABASE Example


```
<?php
$servername = "localhost";
$username = "root";
$password = "";
$conn = mysqli_connect($servername, $username, $password);//MySQLi Procedural
connection object
if (!$conn) {
   die("Connection failed: " . mysqli_connect_error());
}
$sql = "CREATE DATABASE myDB";//query string
if (mysqli_query($conn, $sql)) {//query execute
   echo "Database created successfully";
} else {
   echo "Error creating database: " . mysqli_error($conn);
}
mysqli_close($conn); // close MySQLi Procedural connection object
?>
```

PDO

CREATE DATABASE Example


```
<?php
$servername = "localhost";
$username = “root";
$password = “";
try {// set the PDO error mode to exception
   $conn = new PDO("mysql:host=$servername", $username, $password); );//PDO connection object
   $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
   $sql = "CREATE DATABASE myDB"; //query string
   $conn->exec($sql); //query execute
   echo "Database created successfully<br>";
   }
catch(PDOException $e)
   {
   echo $sql . "<br>" . $e->getMessage();
   }
$conn = null; //close PDO connection object
?>
```

Create Tables and Columns

Once we have created database we can create the connection object with the database name.

The CREATE TABLE statement is used to create a table in MySQL.

create a table named “User", with five columns: "id", "firstname", "lastname“ and "email".

MySQLi object oriented extension has been used in this example.

Create Tables and Columns

```
<?php
$servername = "localhost";
$username = “root";
$password = "";
$dbname = "myDB";//including database name as a connection variable
$conn = new mysqli($servername, $username, $password,  $dbname);
//below is query string
$qry = "CREATE TABLE Users (
id INT(6) UNSIGNED AUTO_INCREMENT PRIMARY KEY,
firstname VARCHAR(30) NOT NULL,
lastname VARCHAR(30) NOT NULL,
email VARCHAR(50)
)";
$res = $conn->query($qry);//execute query
if($res)
{               echo "table created successfully";                }
else
{               echo "error occurred";                }
$conn->close();
?>
```

Insert Data

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

If a column is AUTO_INCREMENT (like the "id" column) , it will automatically add the value. No need to mention in the query string.

Insert Data

```
<?php
$servername = "localhost";
$username = "username";
$password = "password";
$dbname = "myDB";
$conn = new mysqli($servername, $username, $password, $dbname);
if ($conn->connect_error) {
   die("Connection failed: " . $conn->connect_error);
}
$sql = "INSERT INTO Users (firstname, lastname, email)
VALUES ('alice', NULL, 101010)";
$res = $conn->query($qry);//execute query
if($res)
{            echo "new record inserted";       }
else
{            echo "error occurred";             }

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

Insert data as php variable

```
<?php
$servername = "localhost";
$username = "username";
$password = "password";
$dbname = "myDB";
$conn = new mysqli($servername, $username, $password, $dbname);
if ($conn->connect_error) {    die("Connection failed: " . $conn->connect_error);}
$fame = " alice ";
$lname = " redd ";
$email = " alice@gmail.com ";

$sql = "INSERT INTO Users (firstname, lastname, email)
VALUES ($fame, $lname ,$email .")";
$res = $conn->query($qry);//execute query
if($res)
{              echo “new record inserted";       }
else
{              echo "error occurred";              }
$conn->close();
?>
```

Insert Multiple Data

- Multiple SQL statements must be executed with the mysqli_multi_query() function.
- each SQL statement must be separated by a semicolon.

Insert Data with Multiple Query

```
<?php
$servername = "localhost";
$username = “root";
$password = "";
$dbname = "myDB";
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
   die("Connection failed: " . $conn->connect_error);
}
//appending SQL string
$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')";
$res = $conn->query($qry);//execute query
if($res){ echo “new record inserted";          }
else { echo "error occurred"; }
$conn->close();
?>
```

References

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Books

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