ICT 5 Web Development

Chapter 6.1. Using MySQL with PHP

Objectives

- To understand the advantages of using databases to store Web data
- To learn how to prepare a MySQL database for use with PHP
- To learn how to store, retrieve, and update data in a MySQL database

Content

What is a database?

- A set of data organized into one or more computer files.
- Using files for product inventory is a type of database
- Generally the term is reserved for more formal database systems like access, Oracle or MySQL.

Advantages of Databases Over Files

- Faster access
- Better concurrent access
- Easier changes to data and scripts
- Increased security

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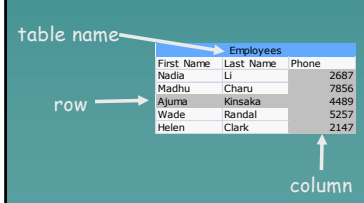
Relational Database?

- A database is a collection of tables with defined relationships between them
- Columns define attributes of the data
  - All data in a column must have the same data type
- A record is stored in a row



Primary key

Product Number	Product	Cost	Weight	Number Avail
0	Hammer	$5.00	12	123
1	Screw Driver	$3.00	2	144
2	Wrench	$2.50	1.5	244

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Which Database System

- PHP works with a variety of databases that include:
  - Oracle
  - Access
  - Ingres
  - SQL Server
  - MySQL
- Will use MySQL since simple to use, free and very popular.

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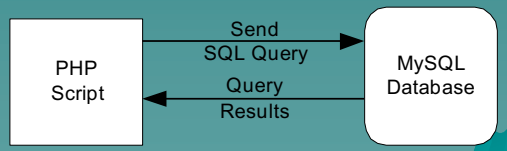
Using A Query Language

- When using a database, use a separate query language to work with database
- Within MySQL, use Structured Query Language (SQL), to access database



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Content

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2. Basic SQL commands

- Connecting to MySQL from the Command Line

```
mysql -uusername -p
```

E.g.:

```
>mysql -uroot
```

- To EXIT MySQL:

```
EXIT;
```

2. Basic SQL Commands (2)

- SQL statements end with a semicolon
- View databases

```
SHOW DATABASES;
```

- Creating a database

```
CREATE DATABASE trii;
```

- Importing a database:

```
mysql -uusername -ppassword
      databasename < filename.sql
```

E.g.:

```
mysql -uroot trii < trii.sql
```

2. Basic SQL Commands (2)

- Use database *databasename*

```
USE databasename;
```

- Display all tables in a database

```
SHOW TABLES;
```

- View column details for a table

```
DESC tablename;
```

Creating a Database Instance

- Once you have access to a server with MySQL installed, need to get a database instance created for you.
  - Usually created by a database administrator
  - Creates a database instance, userid and password.

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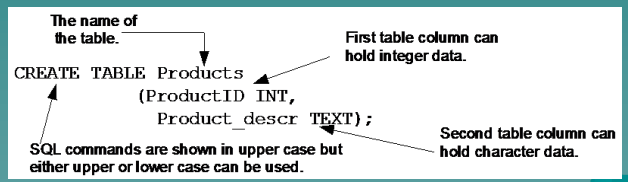
3. Creating a table

- Once database instance is created need to create your tables.
  - Use SQL CREATE TABLE command



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MySQL Data Types

- TEXT
  - hold a large amount of character data
  - Use space inefficiently since it reserves space for up to 65,535 characters.
- CHAR(N)
  - hold a fixed length string of up to N characters (N must be less than 256).
- VARCHAR(N)
  - hold a variable length string of up to N characters
  - removes any unused spaces on the end of the entry.

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MySQL Data Types (2)

- INT
  - hold an integer with a value from about –2 billion to about 2 billion.
- INT UNSIGNED
  - hold an integer with a value from 0 to about 4 billion.
- SMALLINT
  - hold an integer with a value from –32,768 to 32,767.
- SMALLINT UNSIGNED
  - hold an integer with a value from 0 to 65,535.
- DECIMAL(N,D)
  - a number that supports N total digits, of which D digits are to the right of the decimal point.

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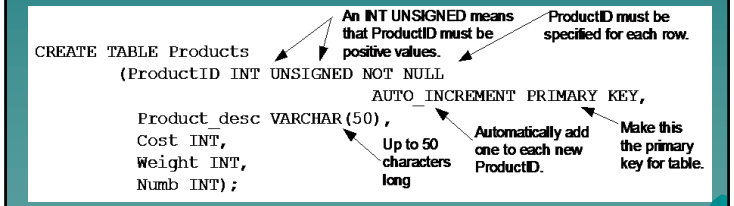
Some additional CREATE TABLE Options

- Can specify some additional options in CREATE TABLE:



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Issuing CREATE TABLE From PHP Script Segment

```
1. $connect = mysql_connect($server, $user, $pass);
2. if ( !$connect ) {
3.         die ("Cannot connect to $server using $user");
4. } else {
5.     mysql_select_db('MyDatabaseName');
6.     $SQLcmd = 'CREATE TABLE Products(
                    ProductID INT UNSIGNED NOT NULL
                              AUTO_INCREMENT PRIMARY KEY,
                    Product_desc VARCHAR(50), Cost INT,
                    Weight INT, Numb INT)';
7.     mysql_query($SQLcmd, $connect);
8.     mysql_close($connect);
9. }
```

Connect to MySQL

Issue the SQL query to the database.

Updated API: https://www.w3schools.com/php/php_mysql_connect.asp

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Full Script

```
1. <html><head><title>Create Table</title></head><body>
2. <?php
3. $server = 'localhost';
4. $user = 'phppgm';
5. $pass = 'mypasswd';
6. $mydb = 'mydatabase';
7. $table_name = 'Products';
8. $connect = mysql_connect($server, $user, $pass);
9. if (!$connect) {
10.       die ("Cannot connect to $server using $user");
11. } else {
12.       $SQLcmd = "CREATE TABLE $table_name (
              ProductID INT UNSIGNED NOT NULL
                        AUTO_INCREMENT PRIMARY KEY,
              Product_desc VARCHAR(50),
              Cost INT, Weight INT, Numb INT)";
```

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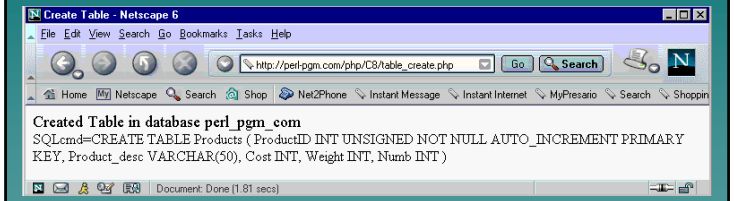
Full Script (2)

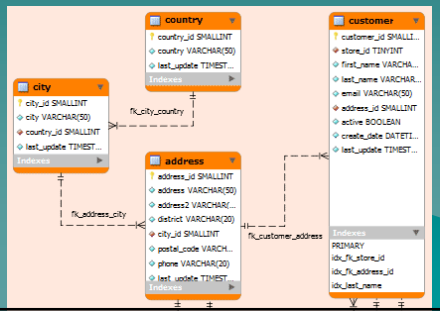
```
13.  mysql_select_db($mydb);
14.  if (mysql_query($SQLcmd, $connect)){
15.    print '<font size="4" color="blue" >Created Table';
16.    print "<i>$table_name</i> in database<i>$mydb</i><br></font>";
17.    print "<br>SQLcmd=$SQLcmd";
18.  } else {
19.    die ("Table Create Creation Failed SQLcmd=$SQLcmd");
20.  }
21.  mysql_close($connect);
22. }
23. ?></body></html>
```


Script Browser Output



MySQL Visual Designer Tools

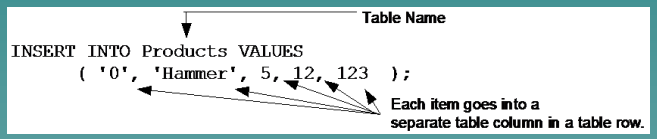
- phpMyAdmin (web-app)
- MySQL Workbench (Win, Linux, Mac)
- **SQLyog**
- ...



Content

4. Inserting data to a table

- Once database is created will need to insert data
- Use the SQL INSERT command



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A Full Example

- Consider an application that allows end-user to enter inventory data:

```
Item Description: <input type="text" size="20"
                  maxlength="20" name="Item">
Weight: <input type="text" size="5"
                  maxlength="20" name="Weight">
Cost: <input type="text" size="5"
                  maxlength="20" name="Cost">
Number Available:<input type="text" size="5"
                  maxlength="20" name="Quantity">
```

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Receiving PHP Script

```
1. <html><head><title>Insert Results</title></head><body>
2. <?php
3. $host = 'localhost';
4. $user = 'phppgm';
5. $passwd = 'mypasswd';
6. $database = 'mydatabase';
7. $connect = mysql_connect($host, $user, $passwd);
8. $table_name = 'Products';
9. $query = "INSERT INTO $table_name VALUES
   ('0','$Item','$Cost','$Weight','$Quantity')";
10. print "The Query is <i>$query</i><br>";
11. mysql_select_db($database);
12. print '<br><font size="4" color="blue">';
13. if (mysql_query($query, $connect)){
14.    print "Insert into $database was successful!</font>";
15. } else {
16.    print "Insert into $database failed!</font>";
17. } mysql_close ($connect);
18. ?></body></html>
```

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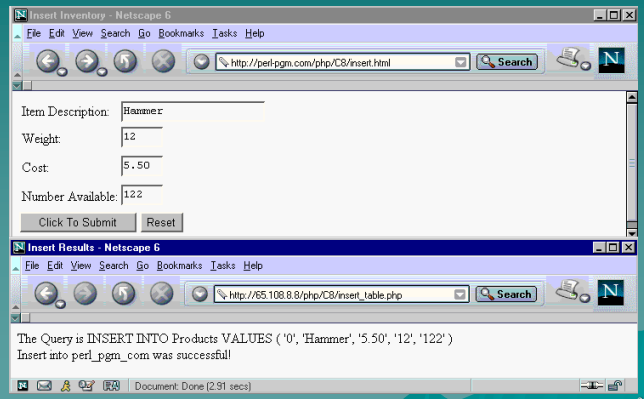
Script Output



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Content

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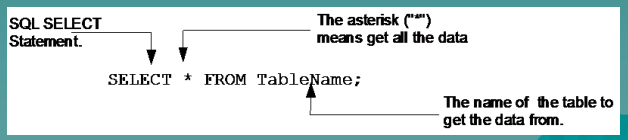
5. Retrieving data from a table

- Two major ways to retrieve data:
  - Retrieving all elements from a table
  - Searching for specific records in a table
- To retrieve all data, use following SQL command



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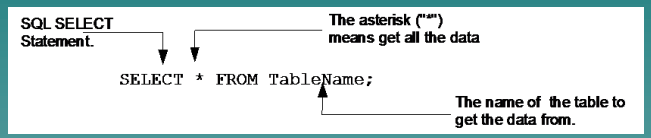
5. Retrieving Data (2)

- To retrieve all data, use following SQL command



- For example

```
1. $connect = mysql_connect('Localhost', 'phppgm',
   'mypasswd');
2. $SQLcmd = 'SELECT * FROM Products';
3. mysql_select_db('MyDatabase');
4. $results_id = mysql_query($SQLcmd, $connect);
```

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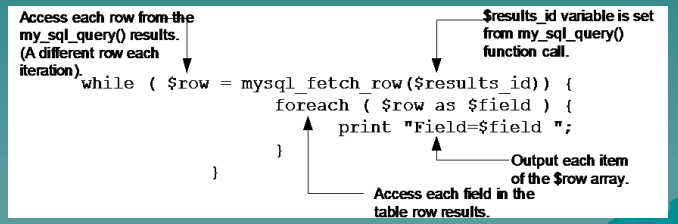
5.1. Using mysql_fetch_row()

- Use the mysql_fetch_row() function to retrieve data on row at a time



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A Script Example

```
1. <html><head><title>Table Output</title></head><body>
2. <?php
3. $host= 'localhost';
4. $user = 'phppgm';
5. $passwd = 'mypasswd';
6. $database = 'phppgm';
7. $connect = mysql_connect($host, $user, $passwd);
8. $table_name = 'Products';
9. print '<font size="5" color="blue">';
10. print "$table_name Data</font><br>";
11. $query = "SELECT * FROM $table_name";
12. print "The query is <i>$query </i><br>";
13. mysql_select_db($database);
14. $results_id = mysql_query($query, $connect);
15. if ($results_id) {
16.       print '<table border=1>';
17.       print '<th>Num<th>Product<th>Cost<th>Weight<th>Count';
```

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A Script Example (2)

```
18.       while ($row = mysql_fetch_row($results_id)){
19.          print '<tr>';
20.          foreach ($row as $field) {
21.                print "<td>$field</td> ";
22.          }
23.          print '</tr>';
24.       }
25. } else { die ("Query=$query failed!"); }
26. mysql_close($connect);
27. ?> </table></body></html>
```

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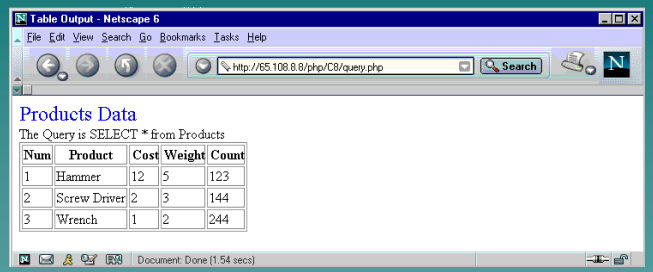
Script Output



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5.2. Searching For Specific Records

- Use the SELECT SQL statement with a WHERE clause
  - `SELECT * FROM TableName WHERE (test_expression);`

The asterisk ("*") means look at all table columns.

Specify the table name to look at.

Specify a test expression to evaluate

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Selected WHERE CLAUSE Test Operators

Operator	SQL Query Example	Meaning
=	SELECT * FROM Products WHERE (Product_desc = 'Hammer');	Retrieve those rows from the Products table that have a Product_desc column with a value **equal to** Hammer.
>	SELECT * FROM Products WHERE (Cost > '5');	Retrieve those rows from the Products table that have a Cost column with a value **greater than** 5.
<	SELECT * FROM Products WHERE (Numb < '3');	Retrieve those rows from the Products table that have a Numb column with a value **less than** 3.
<=	SELECT * FROM Products WHERE (Cost <= '3');	Retrieve those rows from the Products table that have a Cost column with a value **less than or equal to** 3.
>=	SELECT * FROM Products WHERE (Weight >= '10');	Retrieve those rows from the Products table that have a Weight column with a value **greater than or equal to** 10.

Slide 8-37

Consider the following example …

- The following example searches a hardware inventory database for a specific part name entered by the user.
- The form uses the following key HTML form element definition.
  - `<input type="text" name="Search" size="20">`

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PHP Source

```
1. <html><head><title>Search Results</title></head><body>
2. <?php
3. $host= 'localhost';
4. $user = 'phppgm';
5. $passwd = 'mypasswd';
6. $database = 'phppgm';
7. $connect = mysql_connect($host, $user, $passwd);
8. $table_name = 'Products';
9. print '<font size="5" color="blue">';
10. print "$table_name Data</font><br>";
11. $query = "SELECT * FROM $table_name WHERE
                        (Product_desc = '$Search')";
12. print "The query is <i>$query</i> <br>";
13. mysql_select_db($database);
14. $results_id = mysql_query($query, $connect);
```

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PHP Source (2)

```
15. if ($results_id) {
16.   print '<br><table border=1>';
17.   print '<th>Num<th>Product<th>Cost<th>Weight <th>Count';
18.   while ($row = mysql_fetch_row($results_id)) {
19.         print '<tr>';
20.         foreach ($row as $field) {
21.               print "<td>$field</td> ";
22.               }
23.         print '</tr>';
24.    }
25. } else { die ("query=$Query Failed");}
26. mysql_close($connect);
27. ?> </body></html>
```

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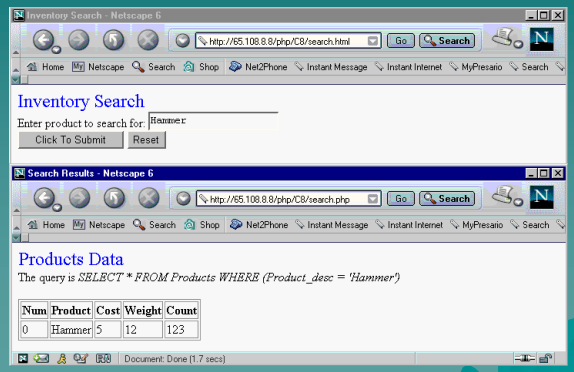
Would have the following output …



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Content

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6. Updating data for a table

- Use SQL UPDATE command when needing to update a database record:

```
UPDATE Table_name
SET col1=chng_express1,col2=chng_express2, ...
WHERE test_expression
```

Specify the name of the table to update.

Optionally specify a `WHERE` clause and test expression.

Specify one or more table column to receive the results of an expression. Optionally specify a `WHERE`

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For Example …

- The following searches the Products table for values of Product_desc equal to Hammer.

```
UPDATE Products
SET Cost=2
WHERE Product_desc = 'Hammer'
```

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For Example …

- The following looks through the Products table for values of Product_desc equal to Hammer.
- When it finds it, it decrements the Count column value by 1.

```
UPDATE Products
SET Count=Count-1
WHERE 'Product_desc=Hammer'
```

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A Full Example …

- Consider the following example
  - Displays current inventory
  - Asks end-user to decrement value for 1 item
  - Uses the following HTML

```
Hammer: <input type="radio" name="Product"
                          value="Hammer">
Screwdriver: <input type="radio"
        name="Product" value="Screwdriver">
Wrench: <input type="radio" name="Product"
                                value="Wrench">
```

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Full Example

```
1. <html><head><title>Product Update
   Results</title></head><body>
2. <?php
3. $host= 'localhost';
4. $user = 'phppgm';
5. $passwd = 'mypasswd';
6. $database = 'phppgm';
7. $connect = mysql_connect($host, $user, $passwd);
8. $table_name = 'Products';
9. print '<font size="5" color="blue">';
10. print "Update Results for Table
                    $table_name</font><br>\n";
11. $query = "UPDATE $table_name
              SET Numb = Numb-1
              WHERE (Product_desc = '$Product')";
12. print "The query is <i> $query </i> <br><br>\n";
13. mysql_select_db($database);
```

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A Full Example (2)

```
14. $results_id = mysql_query($query, $connect);
15. if ($results_id){
16.   Show_all($connect, $database,$table_name);
17. } else {
18.   print "Update=$query failed";
19. }
20. mysql_close($connect);
```

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A Full Example (3)

```
21. function Show_all($connect, $database, $table_name){
22.   $query = "SELECT * from $table_name";
23.   $results_id = mysql_query($query, $connect);
24.   print '<table border=1><th> Num </th>
          <th>Product</th><th>Cost</th>
          <th>Weight</th><th>Count</th>';
26.   while ($row = mysql_fetch_row($results_id)) {
27.       print '<tr>';
28.       foreach ($row as $field){
29.          print "<td>$field</td> ";
30.       }
31.       print '</tr>';
32.   }
33. }
34. ?> </body></html>
```

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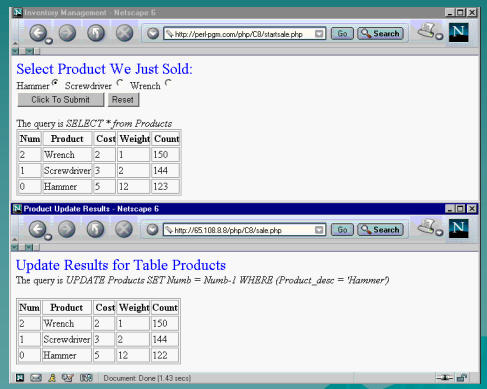
Would output the following:



Slide 8-50

Question?

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