Dynamic Web Development

Lecture 12 – PHP and MySQLi 1

Relational Databases

Part 1

Tables & Fields

In a relational database, data is stored in Tables.

Each Table consists of a number of Records.

Each Record consists of a number of Fields.

DEPT

DEPTNO	DNAME	BUDGET
D1	Marketing	10000
D2	Development	12000
D3	Research	10000

Primary Key

Definition

> “A field with the property that, at any time, no two rows of the table contain the same value in that field.”
>
> This is how the database identifies individual records.

Primary Key

DEPT

DEPTNO	**DNAME**	**BUDGET**
D1	Marketing	10M
D2	Development	12M
D3	Research	10M

SQL - Structured Query Language

All commerical databases recognise SQL commands.

They can be used for:

- creating tables
- putting data into tables
- extracting data from tables

There are slight differences between the various manufacturer's implementations of the SQL standard, but we shall stick to the basic commands.

To enable our web pages to communicate with a database, we need to embed the SQL commands into the PHP code (which is itself embedded in the HTML code).

SQL to create and populate the table

```
CREATE TABLE cdtable
(
cdnum   VARCHAR(4),
cdname  VARCHAR(30),
artist  VARCHAR(30),
PRIMARY KEY (cdnum)
);


INSERT INTO cdtable  VALUES ('0001', 'The Wall', 'Pink Floyd');

INSERT INTO cdtable  VALUES ('0002', 'Tago Mago', 'Can');

INSERT INTO cdtable  VALUES ('0003', 'Till Deaf Us Do Part', 'Slade');

INSERT INTO cdtable  VALUES ('0004', 'In Absentia', 'Porcupine Tree');

INSERT INTO cdtable  VALUES ('0005', 'Space Ritual', 'Hawkwind');
```

Using the GUI to Access the Database

Relational Databases

There are many relational database packages available:

Proprietry Packages:

- Oracle
- MS SQL Server

Open Source:

- MySQL
- PostgreSQL

We are going to use MySQL, which was installed as part of the Xampp package.

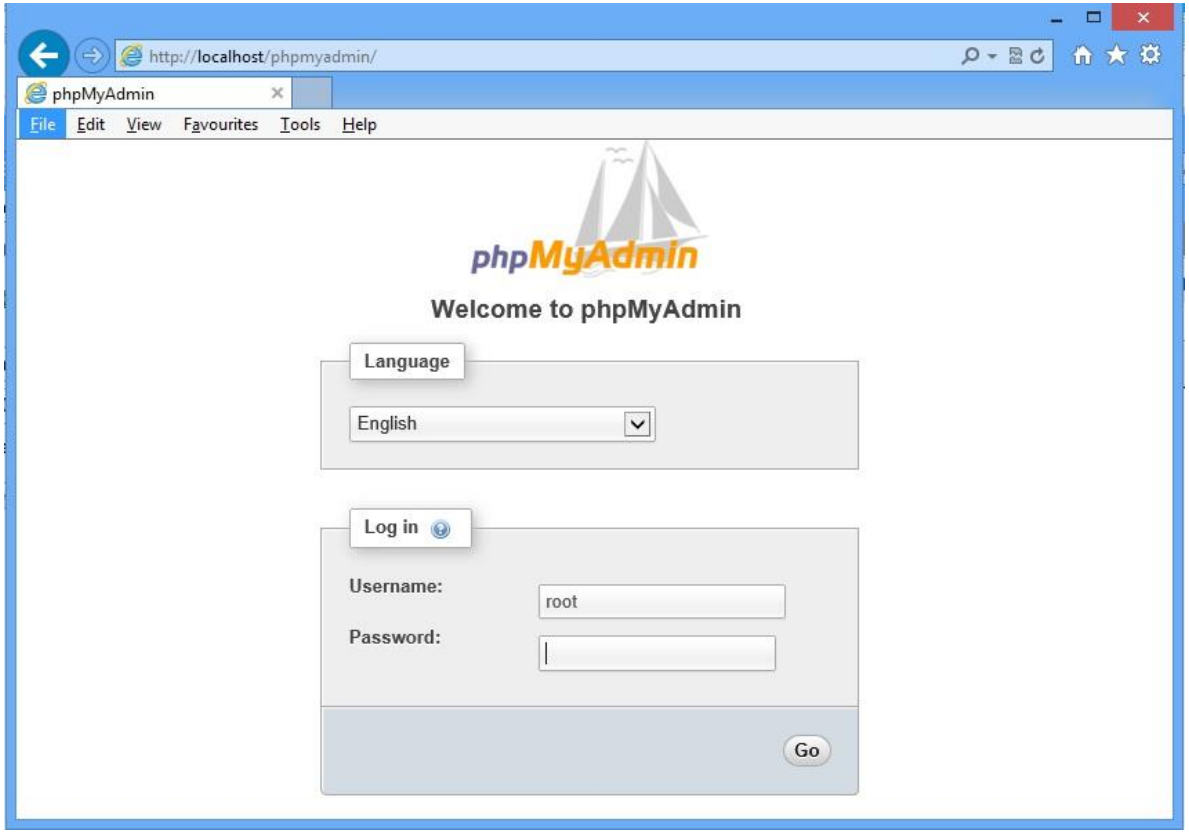
Xampp also sets up a GUI called phpMyAdmin which makes it fairly easy to use....

.....unfortunately. In order to use it:

You Open the GUI

Browse to: http://localhost/phpmyadmin

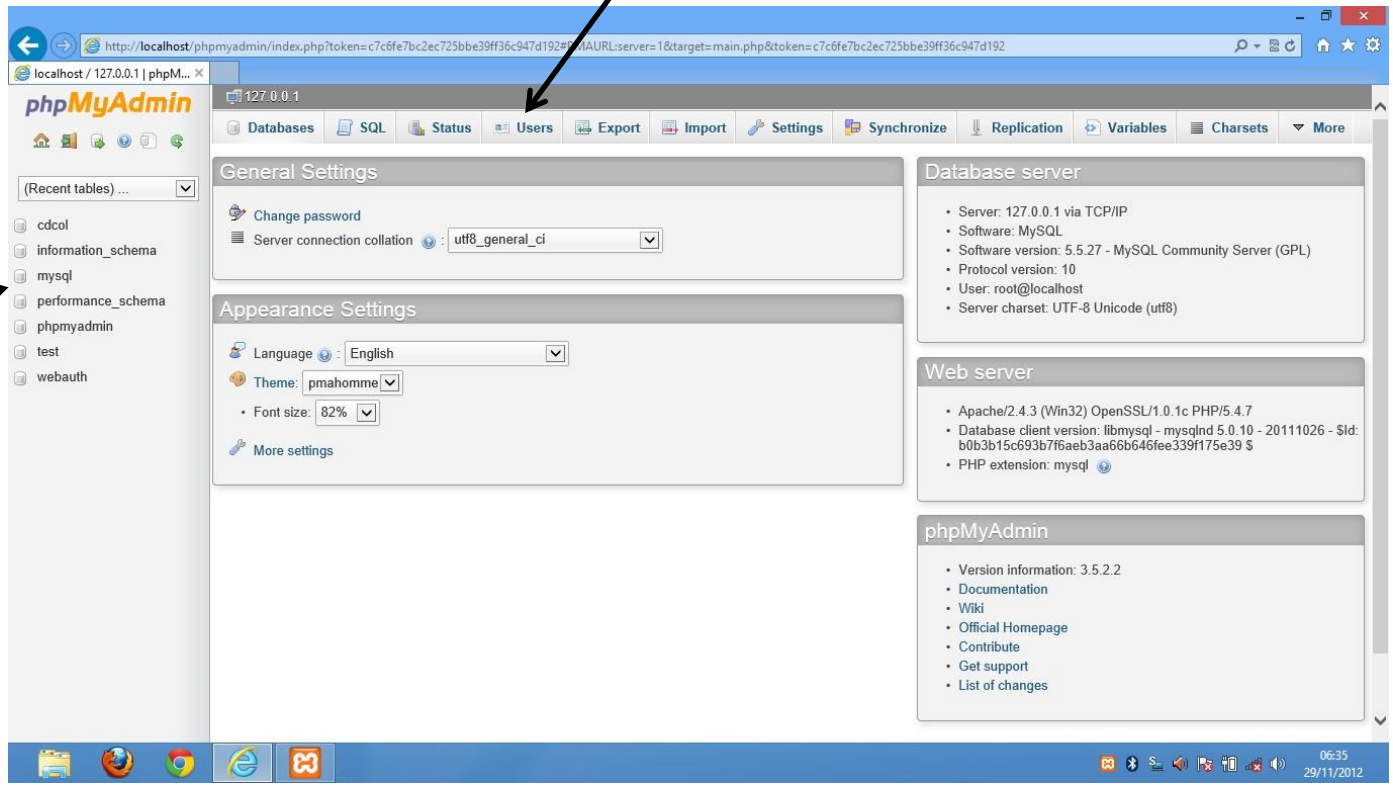
If you set up a root password on installation, use it here



College MySQL screenshot

If you want to set up a different user account, use the Users tab.

You can then set up permissions for that user to access a particular schema



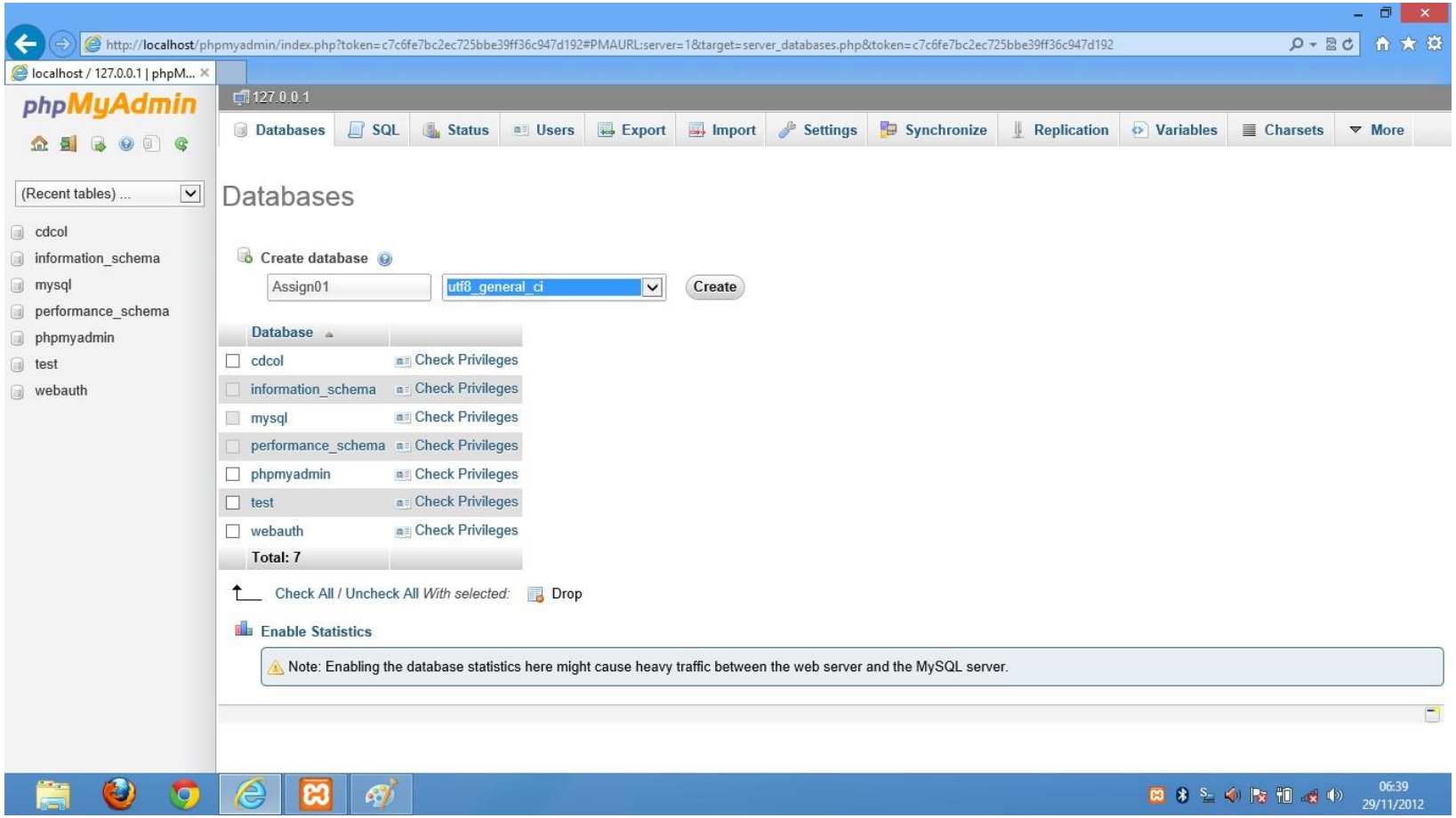
These are different database schema.

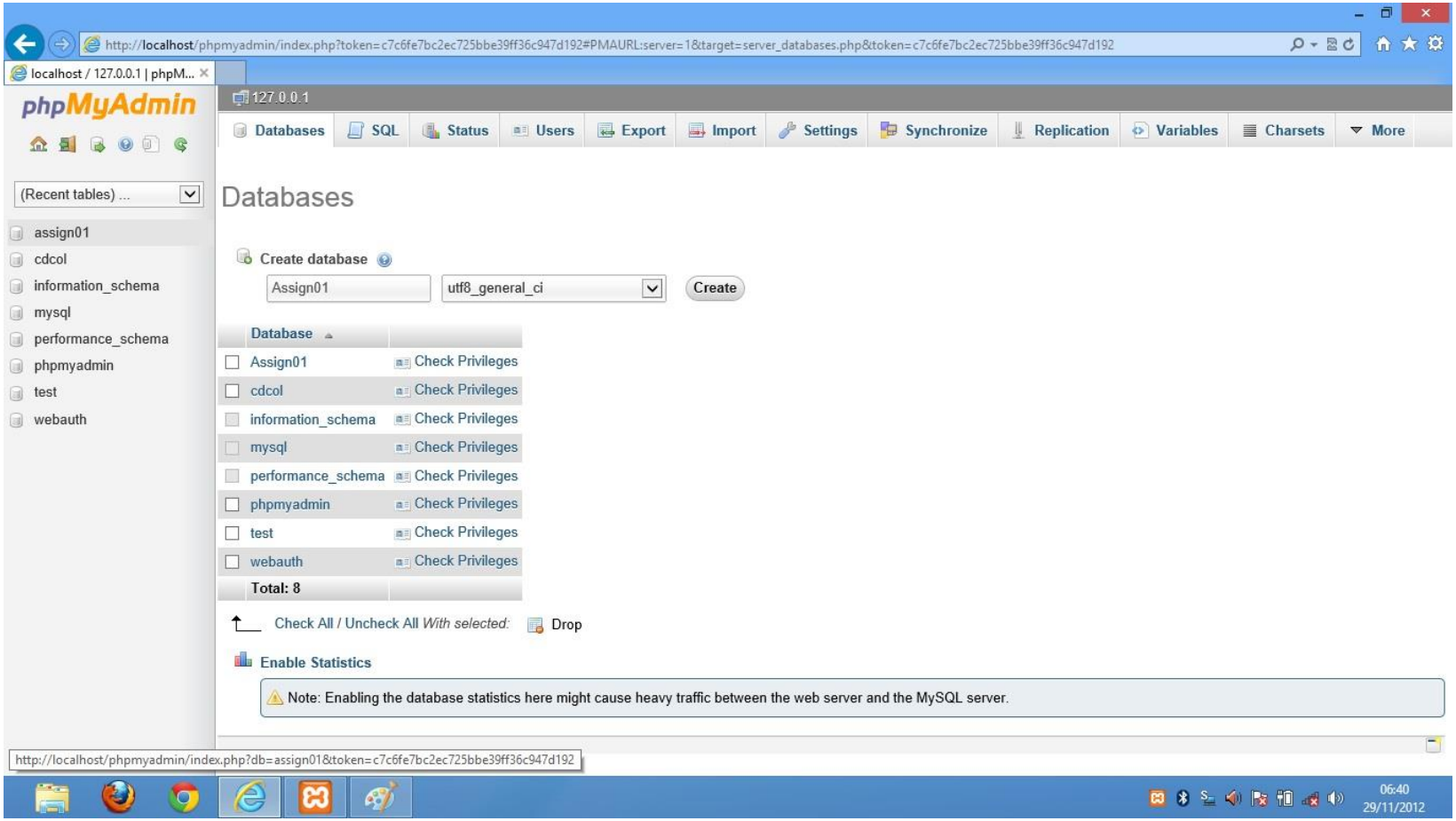
Each schema can contain a set of related tables.

Click on a schema name to see the tables inside

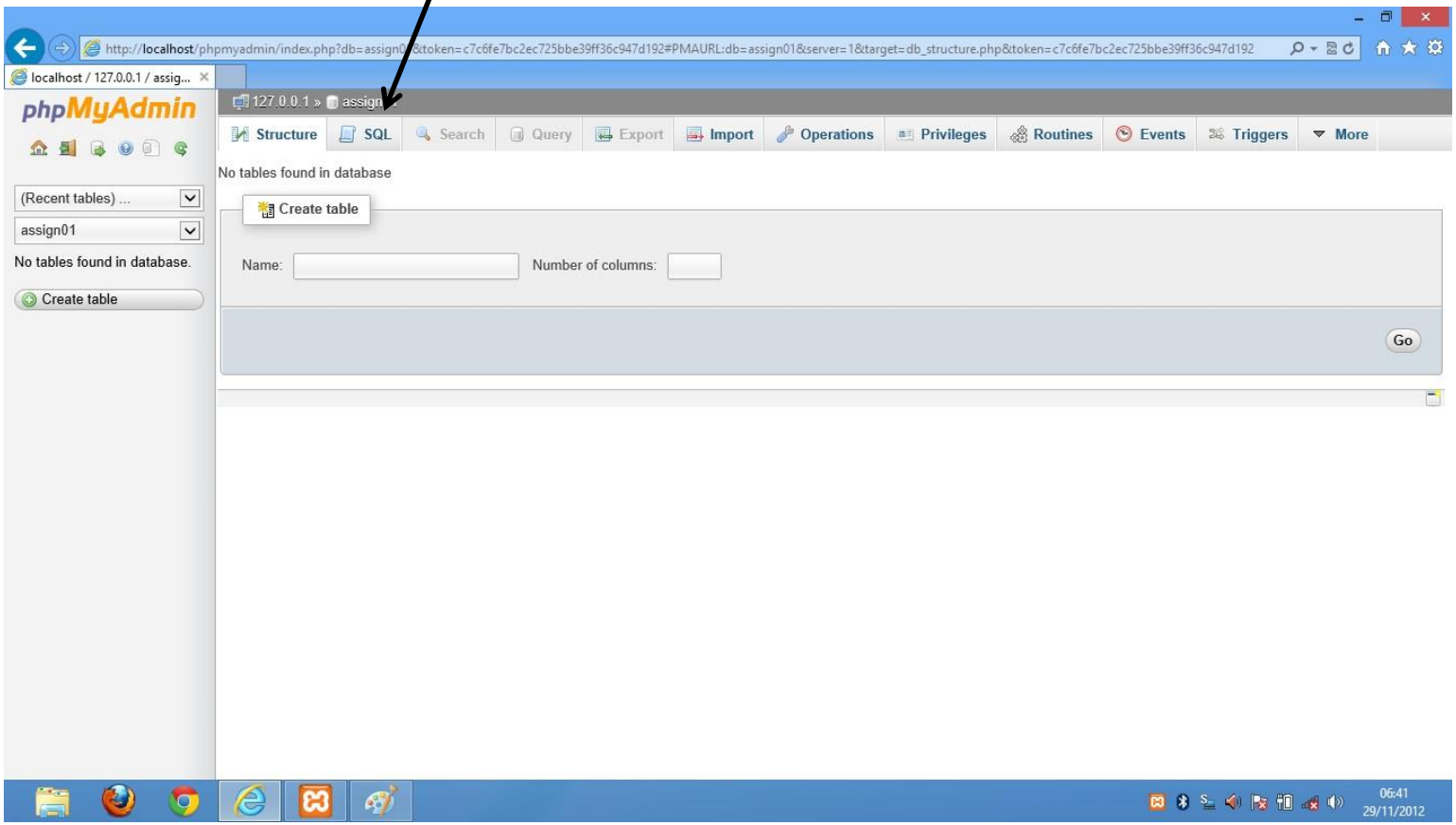
To Create a New Database Schema

Click on the Databases tab

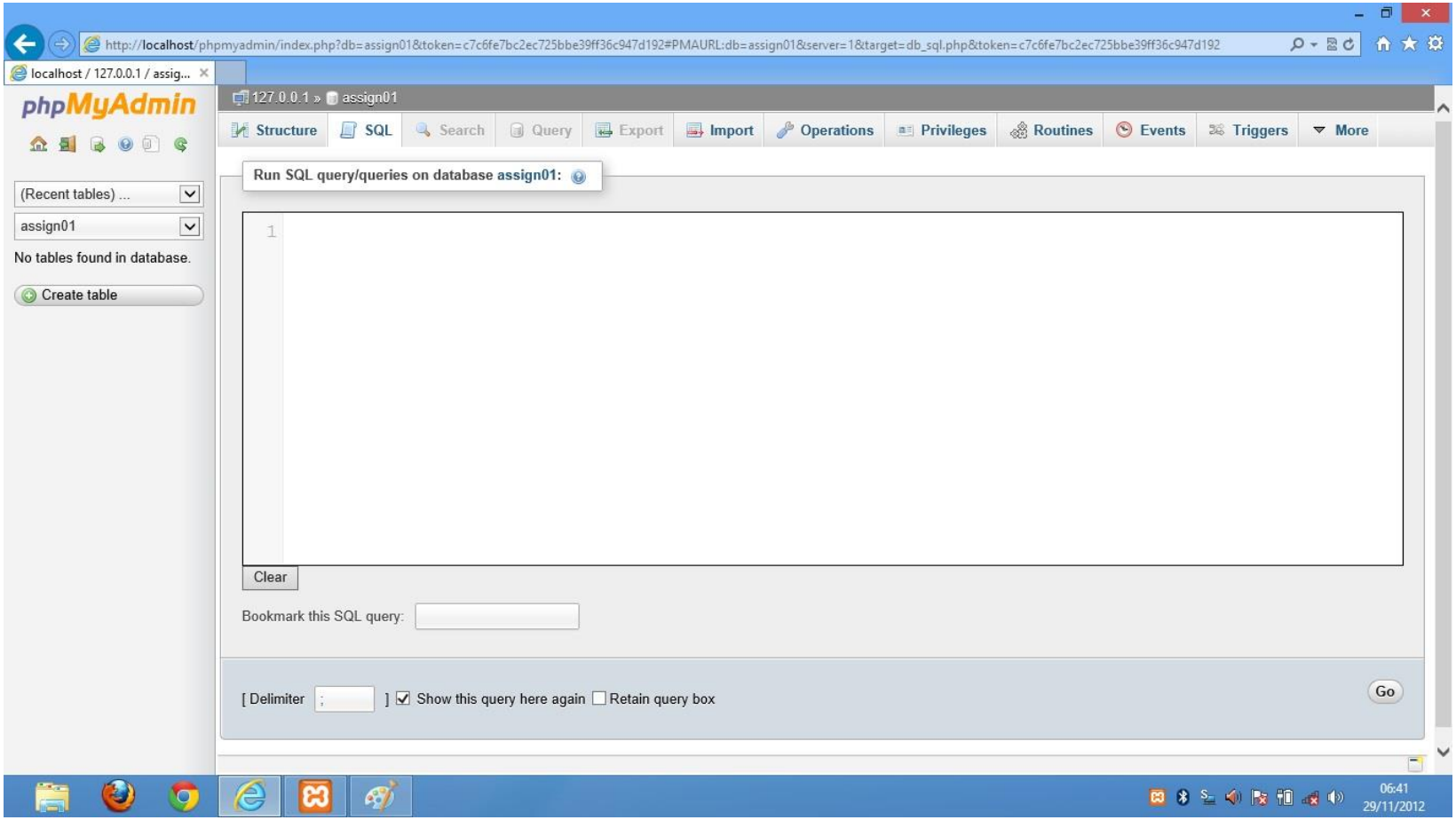



http://localhost/phpmyadmin/index.php?token=c7c6fe7bc2ec725bbe39ff36c947d192#PMAURL:server=1&target=server_databases.php&token=c7c6fe7bc2ec725bbe39ff36c947d192
localhost / 127.0.0.1 | phpM...
phpMyAdmin
127.0.0.1
Databases
SQL
Status
Users
Export
Import
Settings
Synchronize
Replication
Variables
Charsets
More
(Recent tables) ...
assign01
cdcol
information_schema
mysql
performance_schema
phpmyadmin
test
webauth
Databases
Create database
Assign01
utf8_general_ci
Create
Database
Assign01 Check Privileges
cdcol Check Privileges
information_schema Check Privileges
mysql Check Privileges
performance_schema Check Privileges
phpmyadmin Check Privileges
test Check Privileges
webauth Check Privileges
Total: 8
Check All / Uncheck All With selected:
Drop
Enable Statistics
Note: Enabling the database statistics here might cause heavy traffic between the web server and the MySQL server.
http://localhost/phpmyadmin/index.php?db=assign01&token=c7c6fe7bc2ec725bbe39ff36c947d192
06:40
29/11/2012

Rather than using the GUI to create tables, go to the SQL screen



And paste in your scripts from notepad



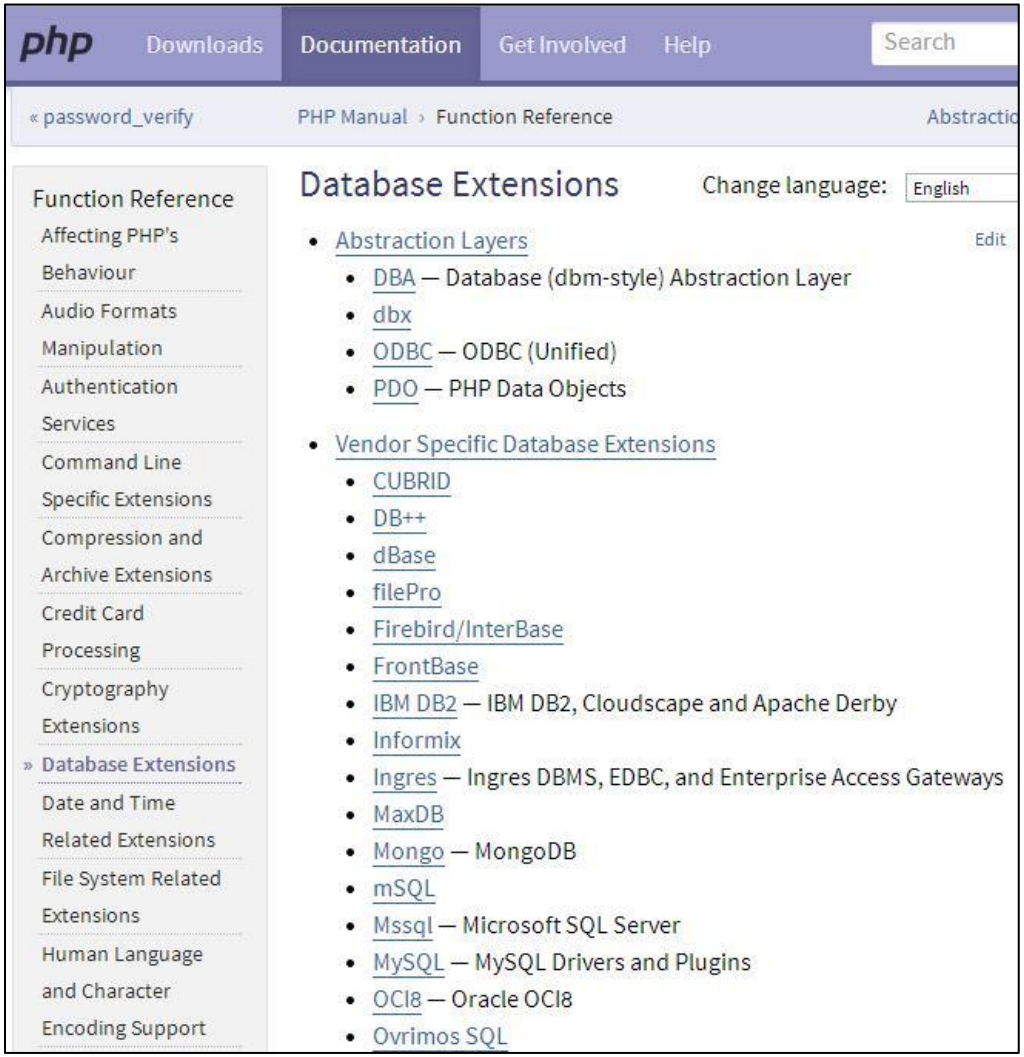
Using PHP to Access the Database

Accessing MySQL databases

PHP has a number of library modules which enable your program to connect to a database server.

Most PHP installations have the MySQL extensions installed by default.

They contain a set of functions that you can use to access a database.



Accessing MySQL databases

There are three main libraries which PHP provides to enable access to a MySQL server.

Mysql	Original MySQL API
Mysqli	MySQL Improved Extension
PDO	PHP Data Objects

Mysql is now deprecated due to security concerns.

Mysqli is the one that we will use.

PDO is an abstraction layer - it hides the details of the proprietary database and enables you to use the same code to access any manufacturers database.

Connecting to the database

```
$connect = new mysqli($host, $user, $password, $database );
```

This function creates a connection to a database.

host	The IP address or hostname of the computer on which the database is located.
username	This is the username that you would normally use to logon to the database.
password	The password that you would normally use to log on to the database.
database	You would normally have chosen this when you created the database.

At the top of each page which will access the database:

```php
<?php
$host = "localhost";
$user = "root";
$password = "abcdefg";
$database = "assign01";

//connect to MySQL

$connect = new mysqli($host, $user, $password, $database );

if ($connect->connect_errno)
  {
    echo "Failed to connect to MySQL: " .
                                    $connect->connect_error;
  }
```

and if you wanted to create and populate the tables:

```
// set up the SQL command

$command1 = "CREATE TABLE cdtable
                  (
                    cdnum   VARCHAR(4),
                    cdname  VARCHAR(30),
                    artist  VARCHAR(30),
                    PRIMARY KEY (cdnum)
                  )";

// execute the query

$results = $connect->query($command1);

// set up the SQL command

$command2 = "INSERT INTO cdtable  VALUES ('0001', 'The Wall', 'Pink Floyd')";

// execute the query

$results2 = $connect->query($command2);
```

Adding Data To the Database From a Form

Page Map

0008
Paranoid
Black Sabbath

form to enter
cd details
(no PHP)

code to insert cd details
into database
(no html)

addcd.html

```
<html>
 <head></head>
 <body>
   <!-- form with three fields and a submit button -->
   <form name="inputcd" action="addcdtodb.php" method="get">
     CD Number: <input type="text" name="disknum"></input>
     <br />
     CD Name: <input type="text" name="diskname"></input>
     <br />
     CD Artist: <input type="text" Name="diskartist"></input>
     <br />
     <input type="submit" value="Add CD"></input>
   </form>
 </body>
</html>
```

This will generate an HTML form

CD Number: 0008

CD Name: Paranoid

Artist: Black Sabbath

Submit

The submit button will load the following page into the browser, and send the contents of the two text boxes:

http://addcdtodb.php?disknum='0008'&
diskname='Paranoid'&artist='Black Sabbath'

addcdtodb.php

```
<?php
$host = "localhost";
$user = "root";
$password = "abcdefg";
$database = "assign01";

// Copy the variables from the URL into these three variables

$dno = $_GET['disknum'];
$dnam = $_GET['diskname'];
$dart = $_GET['diskartist'];

$connect = new mysqli($host, $user, $password, $database );

if ($connect->connect_errno)
{
    echo "Failed to connect to MySQL: " .
                                        $connect->connect_error;
}
```

addcdtodb.php

```
$query = "INSERT INTO cdtable
VALUES (' " . $dno .  " ',' "  . $dnam .  " ',' "  . $dart .  " ')";
```

which, because the dot . in PHP means join two strings, will become

```
$query = "INSERT INTO cdtable
            VALUES (' 0008 ','Paranoid ','Black Sabbath')";
```

addcdtodb.php

```
// execute the query

$results = $connect->query($query);

// jump to the next page

header( 'Location:jobdone.html');
```