

MySQL & PHP

Managing data

Building Data Dynamic Web Sites

- Truly dynamic web sites
 - Content changes over time
 - Content customised for individual user
 - Content automatically generated
- Content Programmatically generated
 - Can be File system based
 - HTML and Images stored on File System
 - Gets hard to manage over time
 - Database based
 - HTML, Images etc all generated from database
 - Easier to manage
 - If data is too large, can overload the database



Database?

Database

- **Structured collection of data.**
 - **Tables**
 - **Fields**
 - **Query**
 - **Reports**
- **Essentially a much more sophisticated implementation of the flat files.**

Relational Database

Relational Database

- Stores data in **separate tables** instead of a single store.
- **Relationships** between tables are set
- In theory, this provides a **faster, more flexible** database system.

Example

- We wish to maintain a **database** of student names, IDs, addresses, and any other information.
- Will be **updated frequently** with new names and information.
- Will want to **retrieve data** based on some predicate.
 - **e.g, 'give me the names of all Massey students who live in Albany'.**
- Will want to update database with new information about students, not previously recorded.
 - **e.g., may decide we want to include IRD nos.**
- Very difficult to manage using 'flat file' systems

Databases

- **Fast, Efficient back end storage**
 - Easier to manage than file system based approach
- **Relational Database structure**
 - Well developed theory and practise
- **Multi-user capable**
 - Multithreaded, multiprocessor, sometimes cluster based systems
- **Standards based queries**
 - **Structured Query Language (SQL)**

MySQL Database

- world's most popular open source database because of its consistent **fast performance, high reliability and ease of use**
- Open Source License:- free
 - GNU General Public License
 - Free to modify and distribute but all modification must be available in source code format
- Commercial:- not free
 - Fully paid up professional support
- **used by Google, Facebook Nokia, YouTube, Yahoo!, Alcatel-Lucent, Zappos.com, etc.**

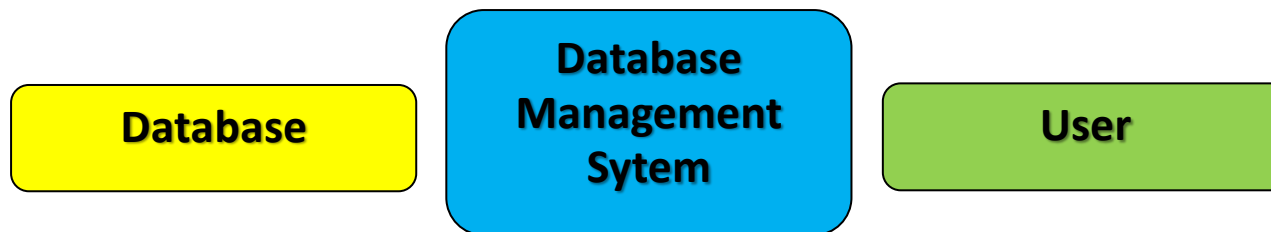
Basic Database Server Concepts

- **Database runs as a server**
 - Attaches to either a default port or an administrator specified port
- **Clients connect to database**
 - For secure systems
 - authenticated connections
 - usernames and passwords
- **Clients make queries on the database**
 - Retrieve content
 - Insert content
- **SQL (Structured Query Language)** is the language used to insert and retrieve content

Database Management System?

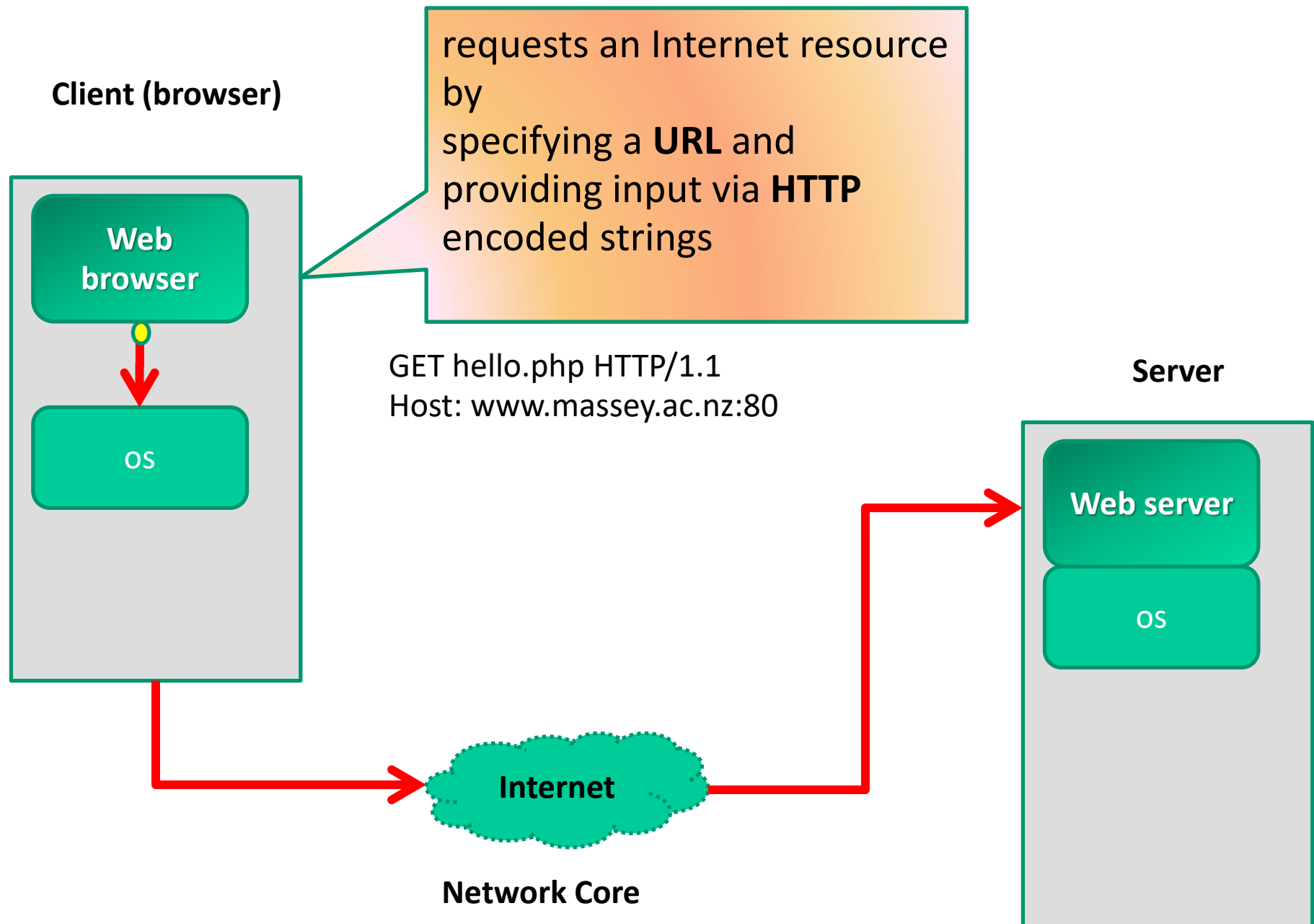
Database Management System

- **Manages the storage and retrieval of data to and from the database and hides the complexity of what is actually going on from the user.**



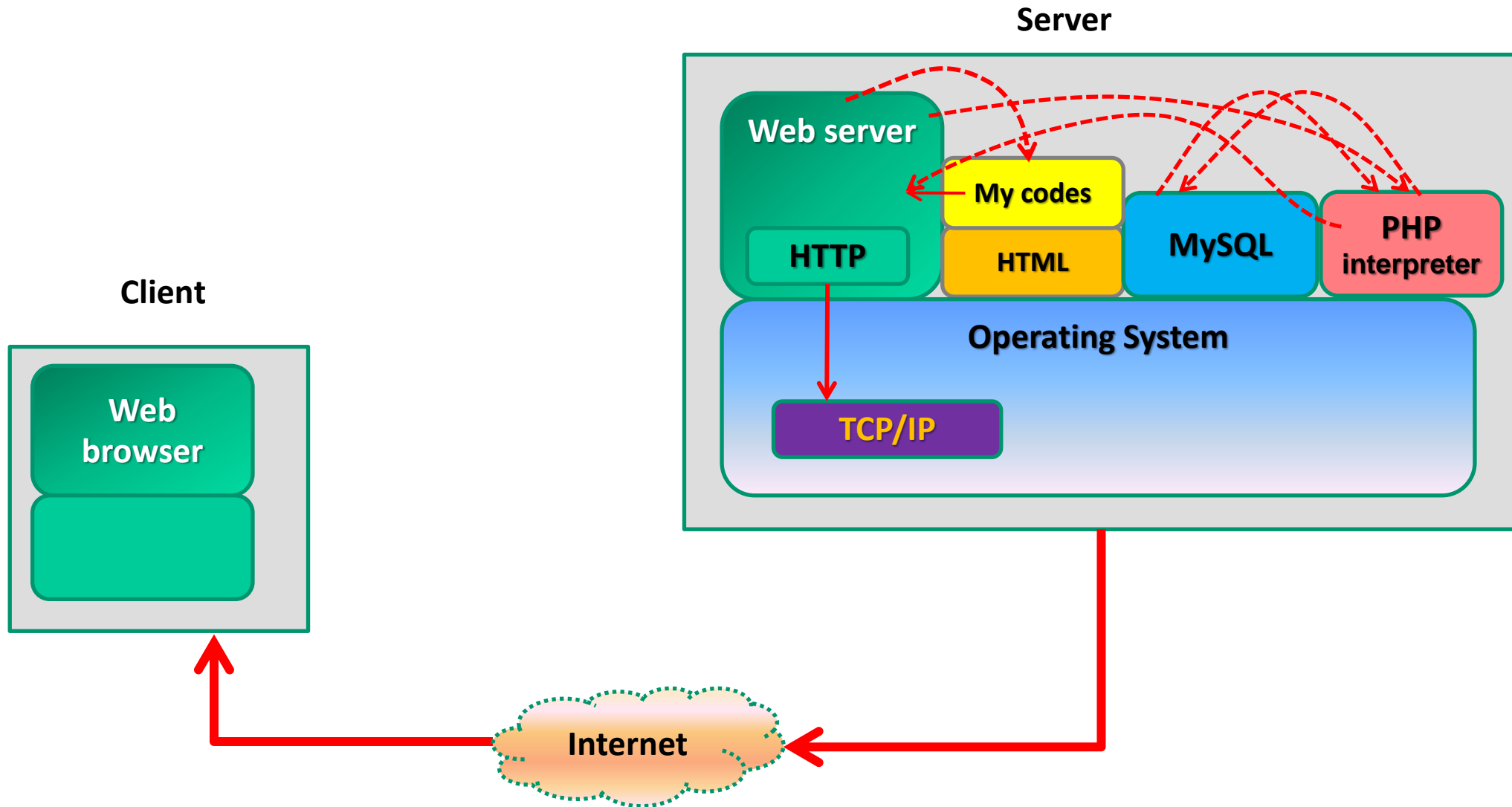
- **MySQL** is a relational database management system

Client: makes a request

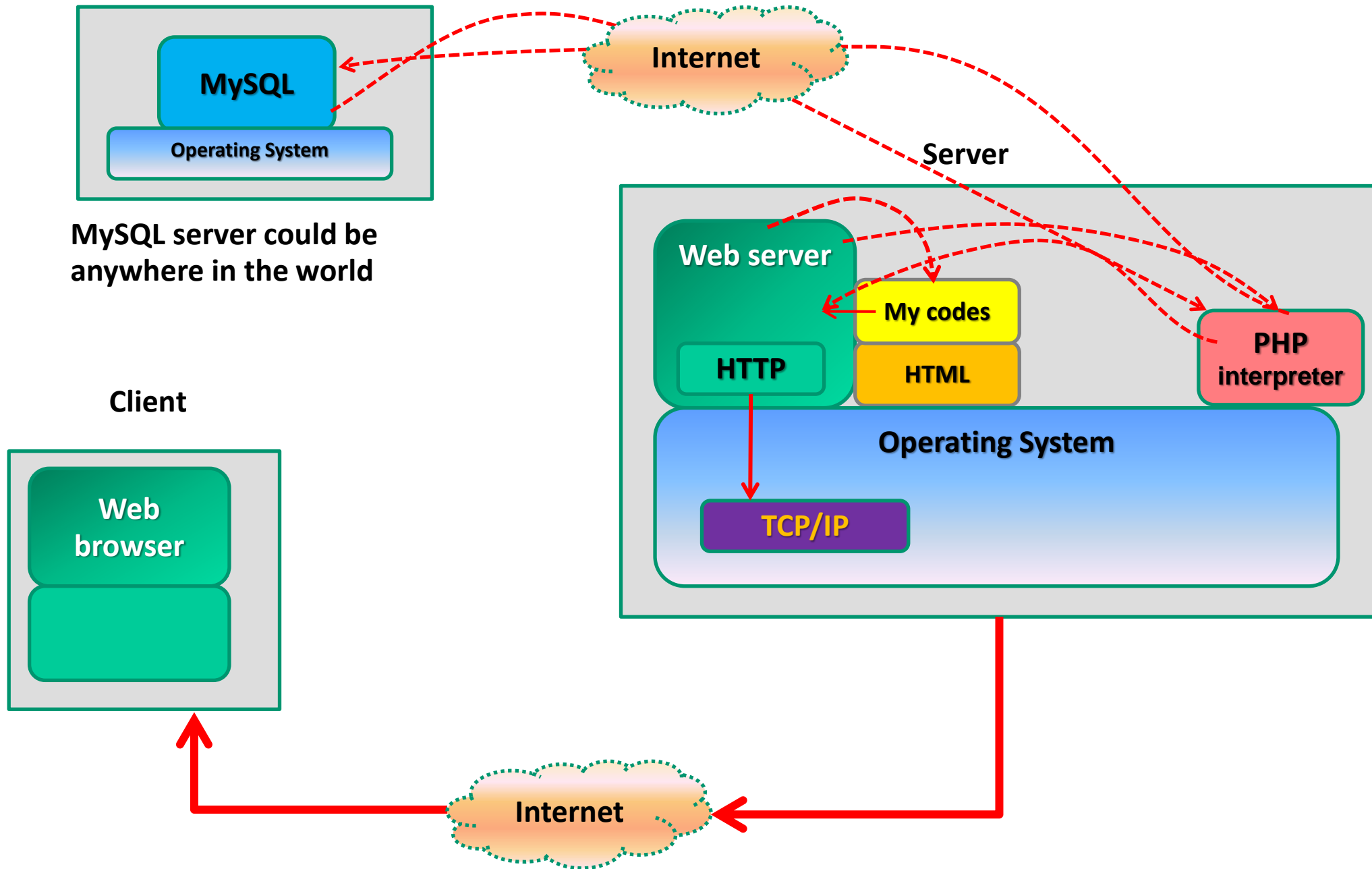


Server: responds

- Webserver supports HTTP.



Server: responds

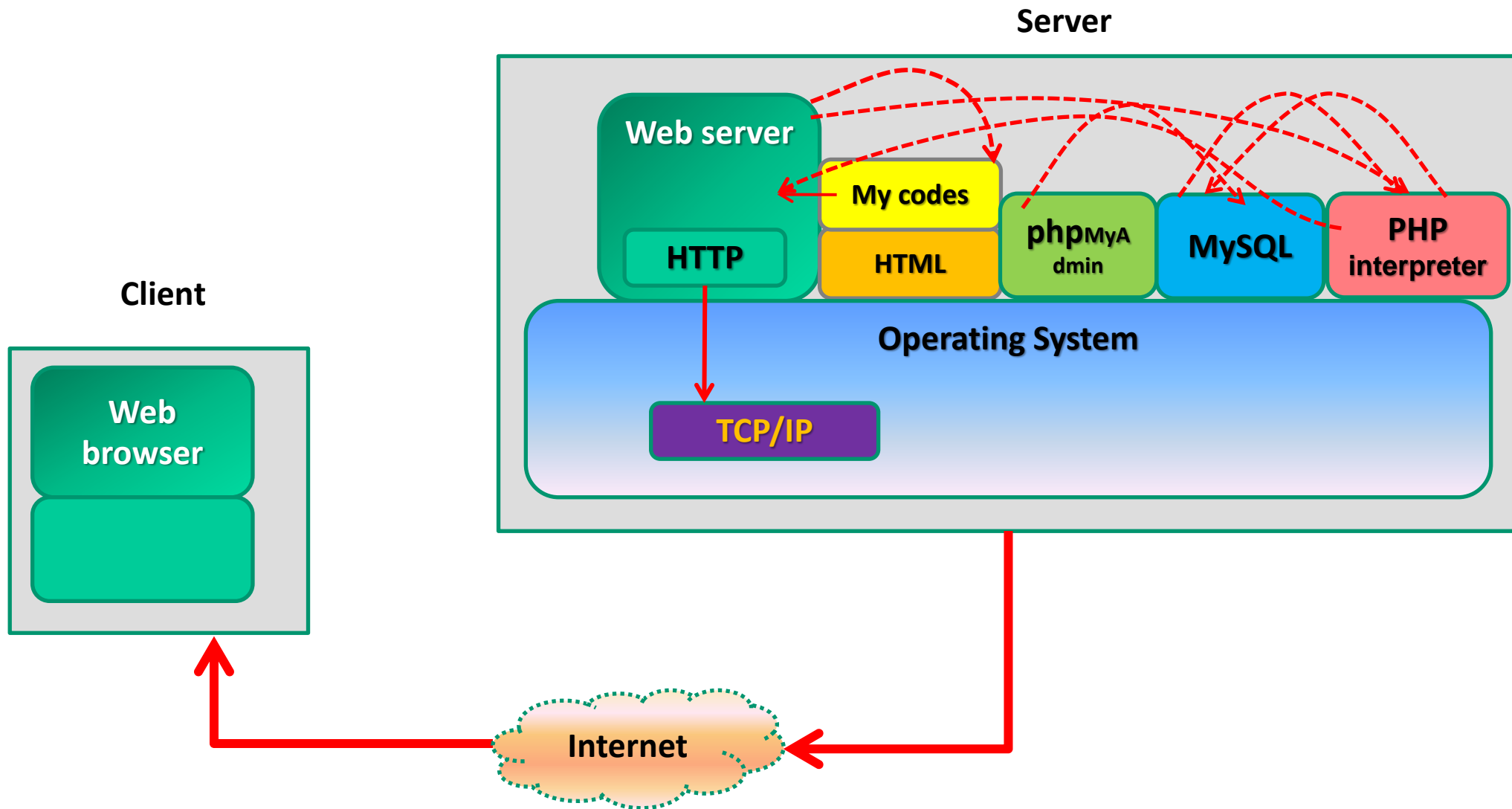


phpMyAdmin

- **MySQL can be controlled through a simple command-line interface; however, we can use phpMyAdmin as an interface to MySQL.**
- **phpMyAdmin is a very powerful tool; it provides a large number of facilities for customising a database management system.**

Server: responds

- Webserver supports HTTP.



Database Example

- A Quick Tour

Table: Customers (data)






























			Id	Title	Surname	Firstname
<input type="checkbox"/>			1	Mrs	Smith	Lynne
<input type="checkbox"/>			4	Miss	Jones	Ann
<input type="checkbox"/>			5	Mr	Brown	Simon
<input type="checkbox"/>			6	Mr	Smith	David
<input type="checkbox"/>			7	Mr	Bell	Peter
<input type="checkbox"/>			8	Ms	Hall	Elizabeth
<input type="checkbox"/>			9	Mr	Smith	Kevin
<input type="checkbox"/>			10	Mr	Jones	Jack
<input type="checkbox"/>			11	Mr	Green	William
<input type="checkbox"/>			12	Mrs	Smith	Lynne
<input type="checkbox"/>			13	Mr	Bell	Simon
<input type="checkbox"/>			14	Mr	Brown	Ian
 Check All / Uncheck All <i>With selected:</i>   						

Table: Products (data)

			Id	Name	Description	Quantity	Cost
<input type="checkbox"/>			1	Beer Glass	600 ml Beer Glass	345	3.99
<input type="checkbox"/>			2	Wine Glass	125 ml Wine Glass	236	2.99
<input type="checkbox"/>			3	Wine Glass	175 ml Wine Glass	436	3.5
<input type="checkbox"/>			4	Shot Glass	50 ml Small Glass	132	1.5
<input type="checkbox"/>			5	Spirit Glass	100 ml Short Glass	489	2.5
<input type="checkbox"/>			6	Long Glass	200 ml Tall Glass	263	2.5
<input type="checkbox"/>			7	Beer Glass	300 ml Beer Glass	247	2.99
<input type="checkbox"/>			8	Wine Glass	225 ml Wine Glass	96	3.99


Check All / Uncheck All
With selected:




Table: Purchases (data)





















































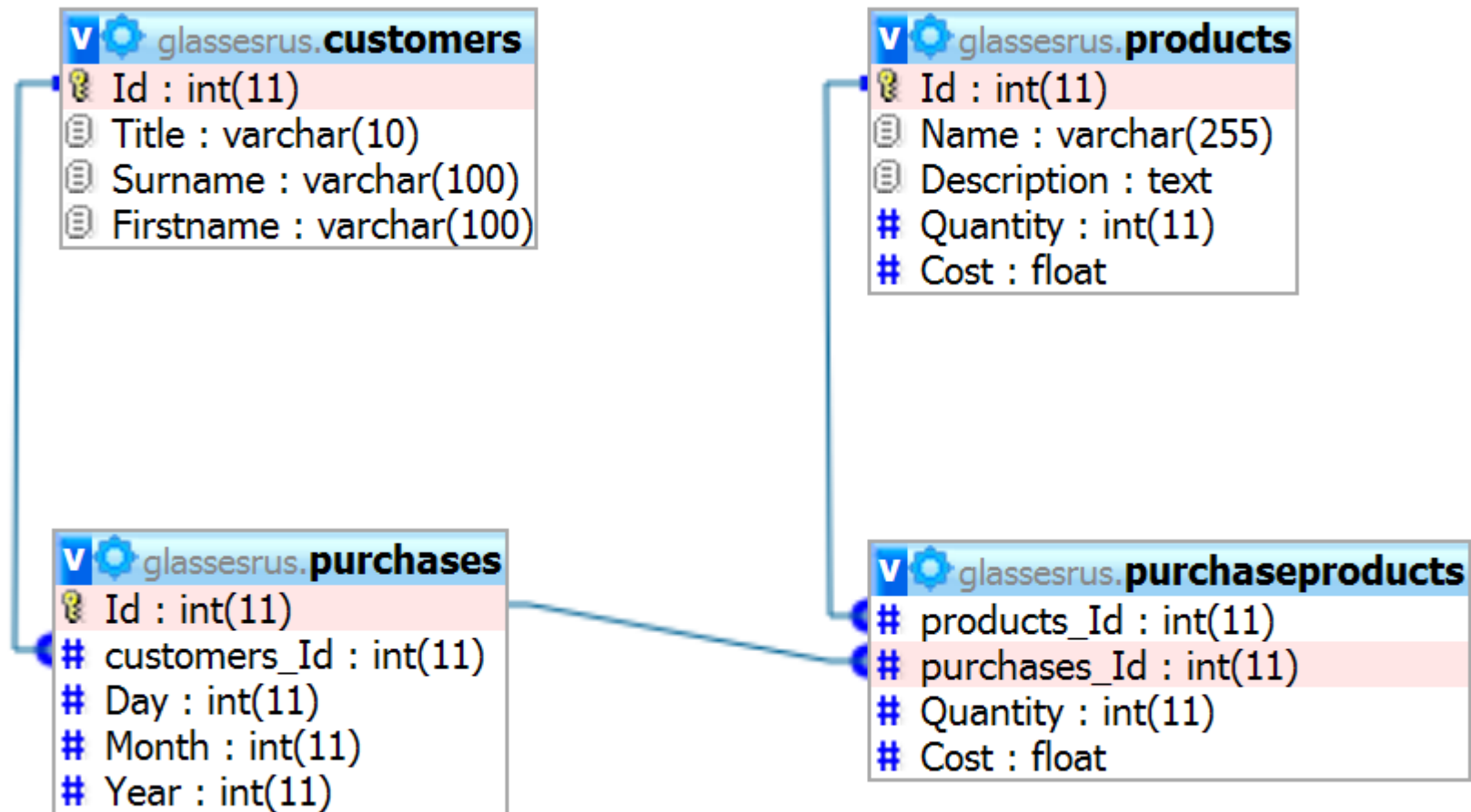
			Id	customers_Id	Day	Month	Year
<input type="checkbox"/>			1	2	3	9	2005
<input type="checkbox"/>			2	4	6	9	2005
<input type="checkbox"/>			3	6	13	9	2005
<input type="checkbox"/>			4	2	22	9	2005
<input type="checkbox"/>			5	1	28	9	2005
<input type="checkbox"/>			6	9	1	10	2005
<input type="checkbox"/>			7	7	1	10	2005
 Check All / Uncheck All With selected:   							

Table: PurchaseProducts (data)

			products_Id	purchases_Id	Quantity	Cost
<input type="checkbox"/>			2	1	20	2.99
<input type="checkbox"/>			3	2	10	3
<input type="checkbox"/>			8	2	30	4.5
<input type="checkbox"/>			6	3	25	2.5
<input type="checkbox"/>			3	4	10	3.5
<input type="checkbox"/>			4	4	100	1.5
<input type="checkbox"/>			5	4	40	3
<input type="checkbox"/>			1	5	22	3.99
<input type="checkbox"/>			1	6	5	3.99
<input type="checkbox"/>			3	7	15	3.5
<input type="checkbox"/>			4	7	25	2
<input type="checkbox"/>			5	7	10	2.5
<input type="checkbox"/>			7	7	55	2.5
<input type="checkbox"/>			8	7	1	3.99
 Check All / Uncheck All With selected:   						

Database Design



Database Field Types

In MySQL there are three main types :

- **text**
- **number**
- **Date/Time.**

Text Field Types

CHAR(size)	Holds a fixed length string (can contain letters, numbers, and special characters). The fixed size is specified in parenthesis. Can store up to 255 characters
VARCHAR(size)	Holds a variable length string (can contain letters, numbers, and special characters). The maximum size is specified in parenthesis. Can store up to 255 characters. Note: If you put a greater value than 255 it will be converted to a TEXT type
TINYTEXT	Holds a string with a maximum length of 255 characters
TEXT	Holds a string with a maximum length of 65,535 characters
MEDIUMTEXT	Holds a string with a maximum length of 16,777,215 characters
LONGTEXT	Holds a string with a maximum length of 4,294,967,295 characters
ENUM(x,y,z,etc.)	Let you enter a list of possible values. You can list up to 65535 values in an ENUM list. If a value is inserted that is not in the list, a blank value will be inserted. Note: The values are sorted in the order you enter them. You enter the possible values in this format: ENUM('X','Y','Z')

Numeric Field Types

TINYINT(size)	-128 to 127 normal. 0 to 255 UNSIGNED*. The maximum number of digits may be specified in parenthesis
SMALLINT(size)	-32768 to 32767 normal. 0 to 65535 UNSIGNED*. The maximum number of digits may be specified in parenthesis
MEDIUMINT(size)	-8388608 to 8388607 normal. 0 to 16777215 UNSIGNED*. The maximum number of digits may be specified in parenthesis
INT(size)	-2147483648 to 2147483647 normal. 0 to 4294967295 UNSIGNED*. The maximum number of digits may be specified in parenthesis
BIGINT(size)	-9223372036854775808 to 9223372036854775807 normal. 0 to 18446744073709551615 UNSIGNED*. The maximum number of digits may be specified in parenthesis
FLOAT(size,d)	A small number with a floating decimal point. The maximum number of digits may be specified in the size parameter. The maximum number of digits to the right of the decimal point is specified in the d parameter
DOUBLE(size,d)	A large number with a floating decimal point. The maximum number of digits may be specified in the size parameter. The maximum number of digits to the right of the decimal point is specified in the d parameter
DECIMAL(size,d)	A DOUBLE stored as a string , allowing for a fixed decimal point. The maximum number of digits may be specified in the size parameter. The maximum number of digits to the right of the decimal point is specified in the d parameter

Date and Time Field Types

DATE()	A date. Format: YYYY-MM-DD Note: The supported range is from '1000-01-01' to '9999-12-31'
DATETIME()	*A date and time combination. Format: YYYY-MM-DD HH:MM:SS Note: The supported range is from '1000-01-01 00:00:00' to '9999-12-31 23:59:59'
TIMESTAMP()	*A timestamp. TIMESTAMP values are stored as the number of seconds since the Unix epoch ('1970-01-01 00:00:00' UTC). Format: YYYY-MM-DD HH:MM:SS Note: The supported range is from '1970-01-01 00:00:01' UTC to '2038-01-09 03:14:07' UTC
TIME()	A time. Format: HH:MM:SS Note: The supported range is from '-838:59:59' to '838:59:59'
YEAR()	A year in two-digit or four-digit format. Note: Values allowed in four-digit format: 1901 to 2155. Values allowed in two-digit format: 70 to 69, representing years from 1970 to 2069

phpMyAdmin

- A Quick Tour

phpMyAdmin

EASYPHP

PHP : MYSQL : APACHE FOR WINDOWS



help

english



5.3.3

www.easyphp.org
Support, download, faq, news, forum...
[+ Support this project](#)

PHP 5.3 migration guide

Most improvements in PHP 5.3.x have no impact on existing code. However, there are a **few incompatibilities** and **new features** that should be considered.



If you want to use EasyPHP on an USB key, you just need to copy the entire EasyPHP folder on the key. Be sure that all scripts are in the folder 'www' and your databases in 'mysql'.

PHP 5.3.3

APACHE 2.2.16

MYSQL 5.1.49

PHPMYADMIN 3.3.5

[+ Manage MySQL](#)

[+ MySQL Parameters](#)

[+ PHP Parameters](#)

[+ Time Zone](#)

[+ Extensions](#)

▼ **LOCAL WEB**

→ C:\Program Files\EasyPHP-5.3.3\www\

Root

07273320

09213244

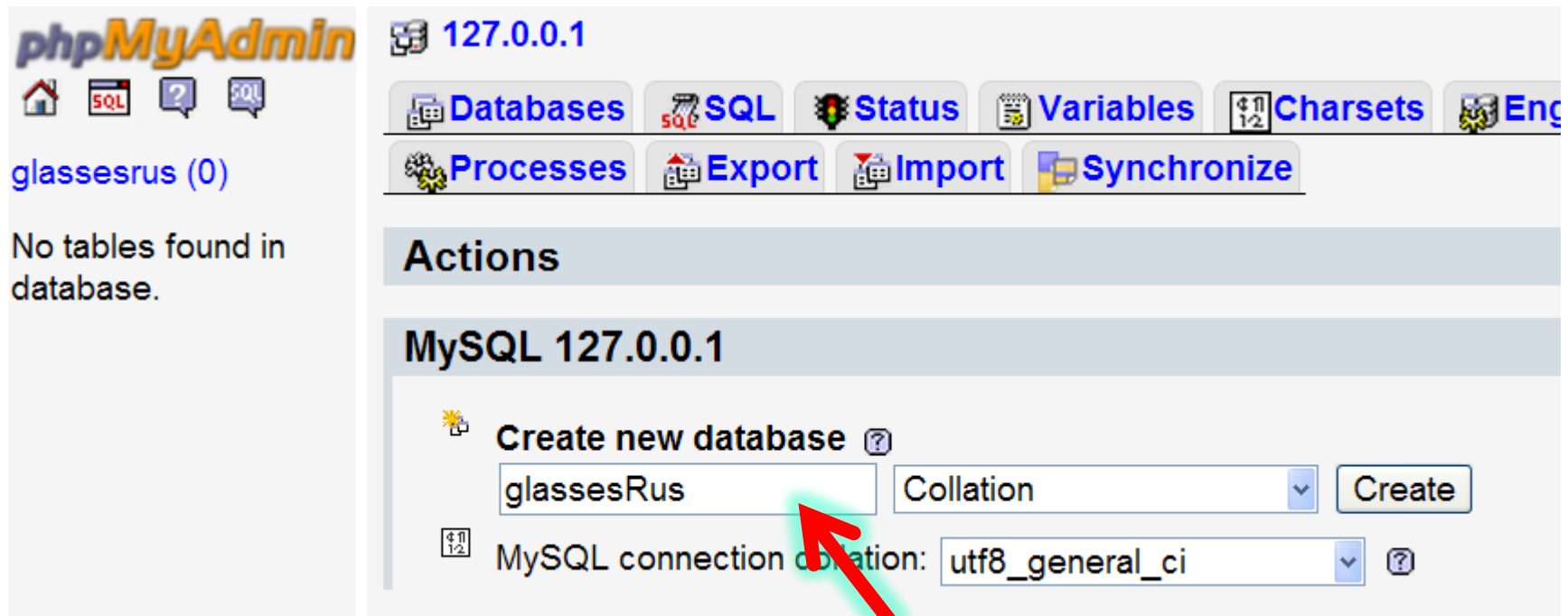
phptest

protected

protected2

temp

Create Database



The screenshot shows the phpMyAdmin interface for a MySQL server at 127.0.0.1. The left sidebar displays the phpMyAdmin logo, navigation icons (Home, SQL, Help, etc.), the username 'glassesrus (0)', and a message 'No tables found in database.' The top navigation bar includes links for Databases, SQL, Status, Variables, Charsets, Engines, Processes, Export, Import, and Synchronize. The main content area is titled 'Actions' and 'MySQL 127.0.0.1'. Under the 'Actions' section, there is a 'Create new database' option with a help icon. Below this, a text input field contains 'glassesRus', a 'Collation' dropdown menu is set to 'utf8_general_ci', and a 'Create' button is visible. A red arrow points to the 'glassesRus' input field. The 'MySQL connection charset' is also set to 'utf8_general_ci'.

phpMyAdmin

glassesrus (0)

No tables found in database.

127.0.0.1

Databases SQL Status Variables Charsets Engines

Processes Export Import Synchronize

Actions

MySQL 127.0.0.1

Create new database ?

glassesRus Collation Create

MySQL connection charset: utf8_general_ci ?

Create Table: Customers



The screenshot shows the phpMyAdmin interface for the 'glassesrus' database. The left sidebar displays the database name and a message: 'No tables found in database.' The main panel shows the 'Structure' tab selected, with a message: 'No tables found in database.' Below this, there is a section titled 'Create new table on database glassesrus'. The 'Name' field contains 'Customers' and the 'Number of fields' field contains '4'. A red arrow points to the 'Name' field.

phpMyAdmin

127.0.0.1 ► glassesrus

Structure SQL Search Tracking Query Exp

Drop

No tables found in database.

Create new table on database glassesrus

Name: Customers Number of fields: 4

Specify the Table's Fields & Attributes: Customers

127.0.0.1 ▶ glassesrus ▶ Customers

Field	Type ?	Length/Values ¹	
<input type="text" value="Id"/>	<input type="text" value="INT"/> ▼	<input type="text"/>	<input type="text" value="No"/>
<input type="text" value="Title"/>	<input type="text" value="VARCHAR"/> ▼	<input type="text" value="10"/>	<input type="text" value="No"/>
<input type="text" value="Surname"/>	<input type="text" value="VARCHAR"/> ▼	<input type="text" value="100"/>	<input type="text" value="No"/>
<input type="text" value="Firstname"/>	<input type="text" value="VARCHAR"/> ▼	<input type="text" value="100"/>	<input type="text" value="No"/>

Table Edit Screen: Customers

127.0.0.1 ► glassesrus ► Customers

Browse Structure SQL Search Tracking Insert Export Import

Operations Empty Drop

✓ Table `glassesrus`.`Customers` has been created.

```
CREATE TABLE `glassesrus`.`Customers` (  
  `Id` INT NOT NULL AUTO_INCREMENT ,  
  `Title` VARCHAR( 10 ) NOT NULL ,  
  `Surname` VARCHAR( 100 ) NOT NULL ,  
  `Firstname` VARCHAR( 100 ) NOT NULL ,  
  PRIMARY KEY ( `Id` )  
) ENGINE = MYISAM ;
```

[\[Edit \]](#) [\[Create PHP Code \]](#)

	Field	Type	Collation	Attributes	Null	Default	Extra	
<input type="checkbox"/>	<u>Id</u>	int(11)			No	None	AUTO_INCREMENT	
<input type="checkbox"/>	Title	varchar(10)	latin1_swedish_ci		No	None		
<input type="checkbox"/>	Surname	varchar(100)	latin1_swedish_ci		No	None		
<input type="checkbox"/>	Firstname	varchar(100)	latin1_swedish_ci		No	None		



[Check All / Uncheck All](#) With selected:



Table: Products

127.0.0.1 ▶ glassesrus ▶ Products

Field	Type ?	Length/Values ¹	
Id	INT		
Name	VARCHAR	255	
Description	TEXT		
Quantity	INT		
Cost	FLOAT		

Table: Products

✓ Table `glassesrus`.`Products` has been created.

```
CREATE TABLE `glassesrus`.`Products` (  
  `Id` INT NOT NULL AUTO_INCREMENT PRIMARY KEY ,  
  `Name` VARCHAR( 255 ) NOT NULL ,  
  `Description` TEXT NOT NULL ,  
  `Quantity` INT NOT NULL ,  
  `Cost` FLOAT NOT NULL  
) ENGINE = MYISAM ;
```

[\[Edit \]](#) [\[Create PHP Code \]](#)

	Field	Type	Collation	Attributes	Null	Default	Extra
<input type="checkbox"/>	<u>Id</u>	int(11)			No	None	AUTO_INCREMENT
<input type="checkbox"/>	Name	varchar(255)	latin1_swedish_ci		No	None	
<input type="checkbox"/>	Description	text	latin1_swedish_ci		No	None	
<input type="checkbox"/>	Quantity	int(11)			No	None	
<input type="checkbox"/>	Cost	float			No	None	

Insert Record: Customers

```
INSERT INTO `glassesrus`.`customers` (  
  `Id`,  
  `Title`,  
  `Surname`,  
  `Firstname`  
)  
VALUES (  
  NULL, 'Mrs', 'Smith', 'Lynne'  
);
```

[Edit] [Create]






























Run SQL query/queries on database **glassesrus**: 

```
INSERT INTO `glassesrus`.`customers` (`Id`,  
  `Title`, `Surname`, `Firstname`) VALUES (NULL,  
  'Mrs', 'Smith', 'Lynne');
```

Fields

Id
Title
Surname
Firstname

Table: Customers (data)

			Id	Title	Surname	Firstname
<input type="checkbox"/>			1	Mrs	Smith	Lynne
<input type="checkbox"/>			4	Miss	Jones	Ann
<input type="checkbox"/>			5	Mr	Brown	Simon
<input type="checkbox"/>			6	Mr	Smith	David
<input type="checkbox"/>			7	Mr	Bell	Peter
<input type="checkbox"/>			8	Ms	Hall	Elizabeth
<input type="checkbox"/>			9	Mr	Smith	Kevin
<input type="checkbox"/>			10	Mr	Jones	Jack
<input type="checkbox"/>			11	Mr	Green	William
<input type="checkbox"/>			12	Mrs	Smith	Lynne
<input type="checkbox"/>			13	Mr	Bell	Simon
<input type="checkbox"/>			14	Mr	Brown	Ian
 Check All / Uncheck All With selected:   						

Insert Record: Products

```
INSERT INTO `glassesrus`.`products` (  
  `Id` ,  
  `Name` ,  
  `Description` ,  
  `Quantity` ,  
  `Cost`  
)  
VALUES (  
  NULL , 'Beer Glass', '600 ml Beer Glass', '345', '3.99'  
);
```

[Edit] [Create]

Run SQL query/queries on database **glassesrus**: ?

```
INSERT INTO `glassesrus`.`products` (`Id`, `Name`,  
`Description`, `Quantity`, `Cost`) VALUES (NULL, 'Beer  
Glass', '600 ml Beer Glass', '345', '3.99');
```

Fields

Id
Name
Description
Quantity
Cost

Table: Products (data)

			Id	Name	Description	Quantity	Cost
<input type="checkbox"/>			1	Beer Glass	600 ml Beer Glass	345	3.99
<input type="checkbox"/>			2	Wine Glass	125 ml Wine Glass	236	2.99
<input type="checkbox"/>			3	Wine Glass	175 ml Wine Glass	436	3.5
<input type="checkbox"/>			4	Shot Glass	50 ml Small Glass	132	1.5
<input type="checkbox"/>			5	Spirit Glass	100 ml Short Glass	489	2.5
<input type="checkbox"/>			6	Long Glass	200 ml Tall Glass	263	2.5
<input type="checkbox"/>			7	Beer Glass	300 ml Beer Glass	247	2.99
<input type="checkbox"/>			8	Wine Glass	225 ml Wine Glass	96	3.99


Check All / Uncheck All
With selected:




Edit Record



0 row(s) affected.

```
UPDATE `glassesrus`.`customers` SET `Firstname` = 'Elizabeth' WHERE `customers`.`Id` =8;
```

[\[Edit \]](#) [\[Crea](#)



Showing rows 0 - 11 (12 total, Query took 0.0008 sec)

```
SELECT *  
FROM `customers`  
LIMIT 0 , 30
```


Export

Export

Select All / Unselect All

customers

products

☐ CodeGen
☐ CSV
☐ CSV for MS Excel
☐ Microsoft Word 2000
☐ LaTeX
☐ MediaWiki Table
☐ Open Document Spreadsheet
☐ Open Document Text
☐ PDF
☐ PHP array
☒ SQL
☐ Taxy! text
☐ Excel 97-2003 XLS Workbook
☐ Excel 2007 XLSX Workbook
☐ XML
☐ YAML

Options

Add custom comment into header (In splits lines)

☒ Comments
☐ Enclose export in a transaction
☐ Disable foreign key checks
SQL compatibility mode
NONE

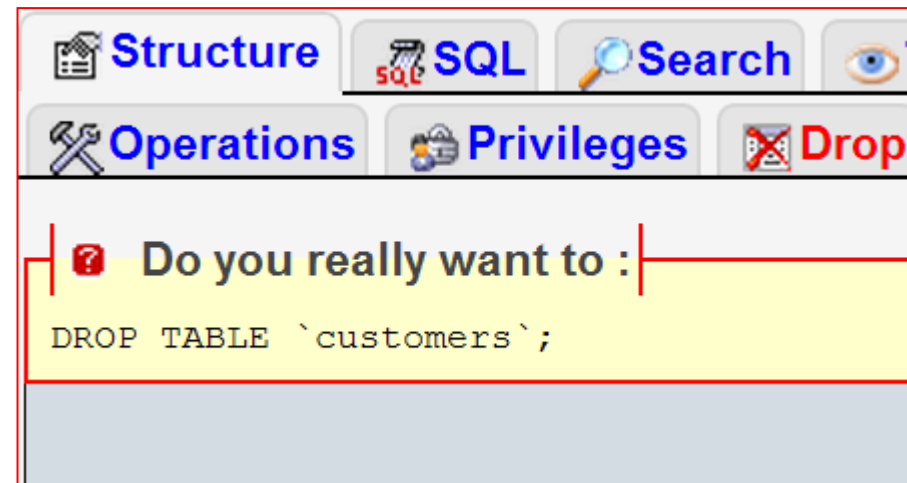
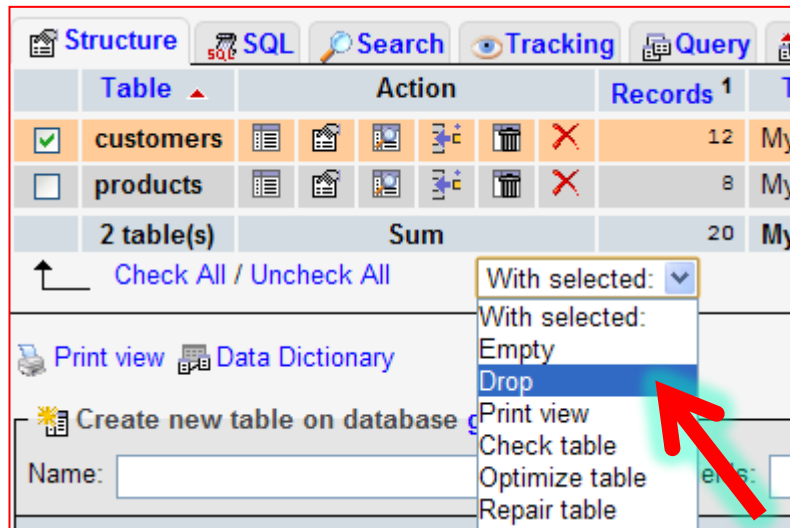
☒ Structure
☐ Add DROP TABLE / VIEW / PROCEDURE / FUNCTION / EVENT
☒ Add IF NOT EXISTS
☒ Add AUTO_INCREMENT value
☒ Enclose table and field names with backquotes
☐ Add CREATE PROCEDURE / FUNCTION / EVENT

Add into comments
☐ Creation/Update/Check dates
☐ Relations
☐ MIME type

☒ Data
☒ Complete inserts
☒ Extended inserts
Maximal length of created query
50000
☐ Use delayed inserts
☐ Use ignore inserts
☒ Use hexadecimal for BLOB
Export type
INSERT

☒ Save as file
☐ Save on server in s... directory ,

Deleting a Table



Restoring a database from an SQL file

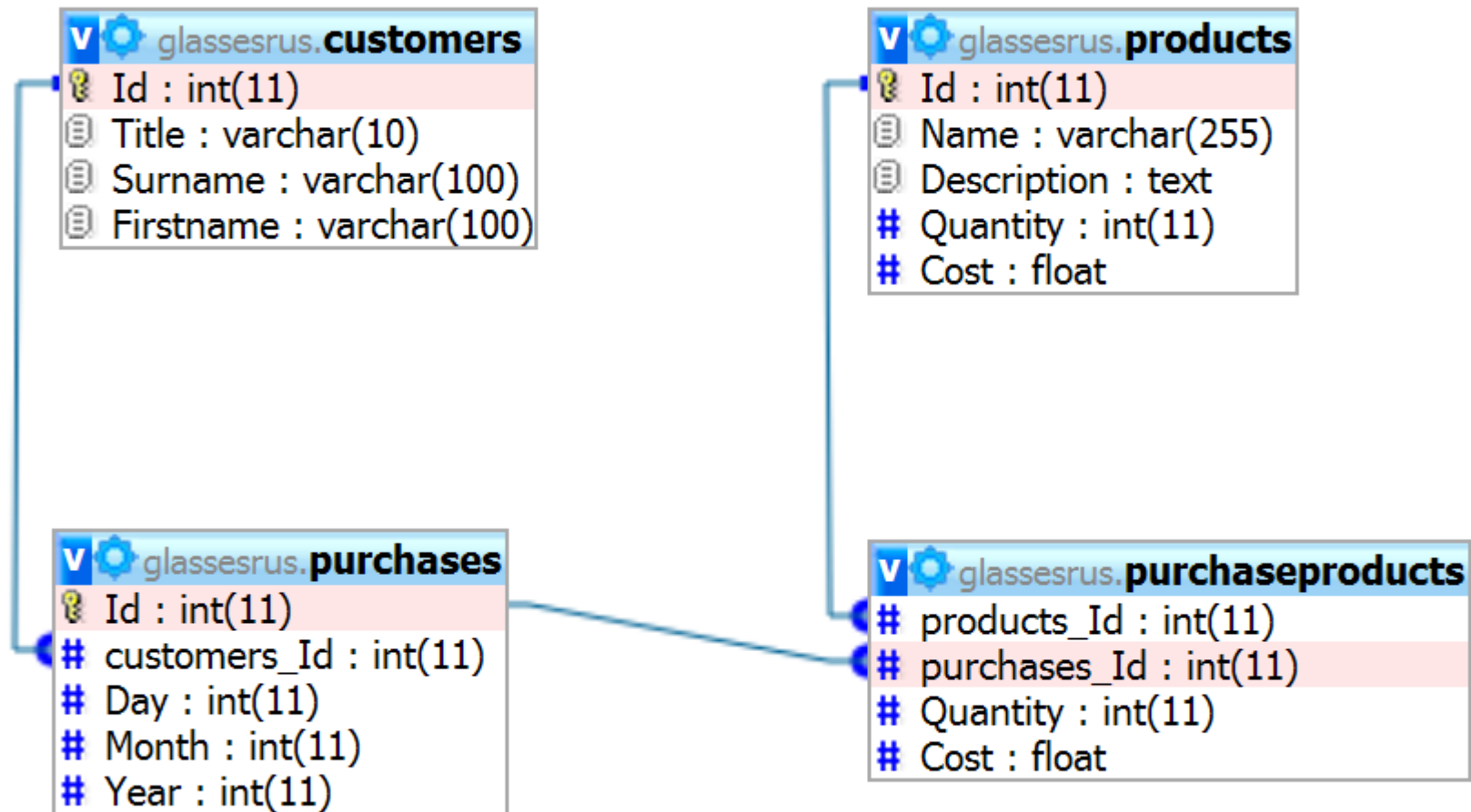
File to import
Location of the text file No file chosen (Max: 100 MB)
Character set of the file:
Imported file compression will be automatically detected from: None, gzip, bzip2

Partial import
☒ Allow the interruption of an import in case the script detects it is close to the end, however it can break transactions.
Number of records (queries) to skip from start

Format of imported file
☐ CSV
☐ Open Document Spreadsheet
☒ SQL
☐ Excel 97-2003 XLS Workbook
☐ Excel 2007 XLSX Workbook
☐ XML

Options
SQL compatibility mode
☐
☒ Do not use AUTO_INCREMENT for new tables
☐

Database Design



Summary

- Concept of databases
- Tables and Fields
- Field Types
- phpMyAdmin Tool for manipulating databases
- Creation of a database
- How to add and edit records
- How to back-up a database
- Database Design

MySQL and PHP

Connecting to a MySQL DBMS

- **In order for our PHP script to access a database we need to form a connection from the script to the database management system.**

```
resourceId = mysql_connect(server, username, password);
```

- Server is the DBMS server
- username is your username
- password is your password

Connecting to a MySQL DBMS

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

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

Connecting to a MySQL DBMS

MySQLi Object-Oriented

```
<?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";
?>
```

MySQLi Procedural

```
<?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";
?>
```