Multimedia im Netz

Online Multimedia

Winter semester 2015/16

Tutorial 04 – Minor Subject

Today’s Agenda

- Repetition: Powerpoint Karaoke
- Introduction to Databases and (My)SQL
- Break Out: Music-Albums Organization Table
- Quiz
- Discussion of “Hangman” Solution (Assignment 03)

Powerpoint Karaoke:
PHP Sessions

Sessions

- Sessions maintain “states” on the **server side**
- Sessions store current state of variables as long as connected to the client
- On the client side, sessions are identified with a **session ID cookie**:
  - default cookie name in PHP: PHPSESSID
  - renaming possible with session_name()

Sessions with PHP

- Sessions need to be started **before any output occurs**
- Create session ID cookie:
  `session_start()`
- Delete the session ID cookie:
  `session_destroy()`
- Read / write session values:
  - superglobal `$_SESSION` array
  - immediately reset session like this `$_SESSION = array();`

Interaction with Databases

Databases and SQL

- Data can be stored **permanently** in databases
- There are a number of database management systems (DBMS). In this lecture & tutorial we use **MySQL**
- SQL (= Structured Query Language) is a language that allows us to access databases. We can retrieve and manipulate data with it.
- With SQL you can:
  - Create databases
  - Create tables
  - Retrieve data from a database
  - Store data in a database
  - ...

Tables in relational databases

- A relational database usually consists of one or more **tables**
- Each table has a unique name with one or more **columns**
- Each table can have multiple entries (or none).
- A table **row** represents an entry

Table: Contacts

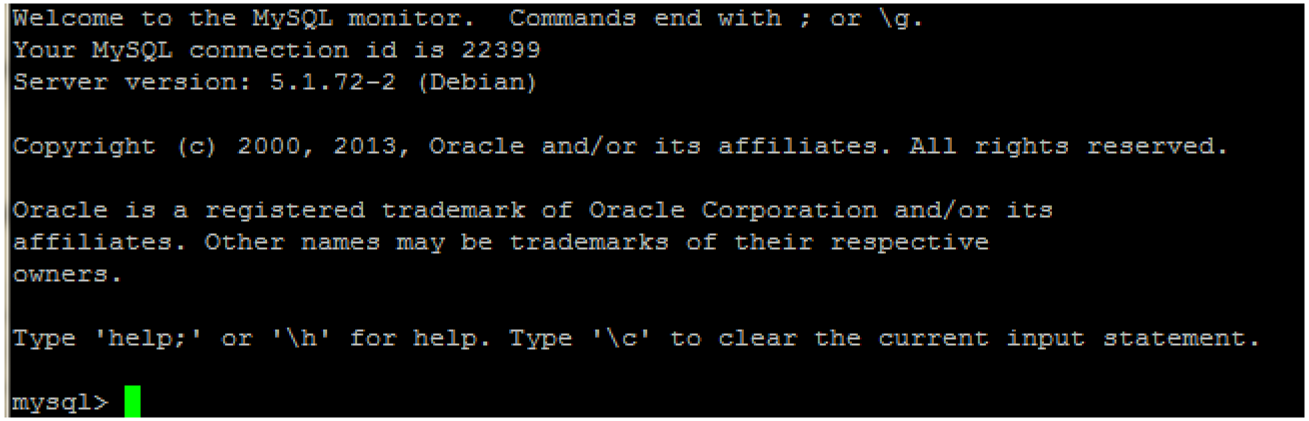
PersonID	FirstName	LastName	PhoneNumber
1	Max	Mustermann	089455544431
2	Laura	Stern	070815643593
3	Tanja	Baumann	0895673138
4	Felix	Maurer	0894562897

MySQL at the CIP-Pool

- Access “Datenbank Management” here: https://tools.rz.ifi.lmu.de/
- Create a new account (required)
- Create a new database (required)
- Connect to db2.cip.ifi.lmu.de

MySQL at the CIP-Pool (II)

- To work with the database, you have to connect to the database server:
  1. Start a SHELL (Ctrl+Alt+T)
  2. Enter the following command:
     `mysql -h db2.cip.ifi.lmu.de –u [username] –p`
  3. Provide your password
  4. If successfull you should see something like this:



```
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 22399
Server version: 5.1.72-2 (Debian)

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```
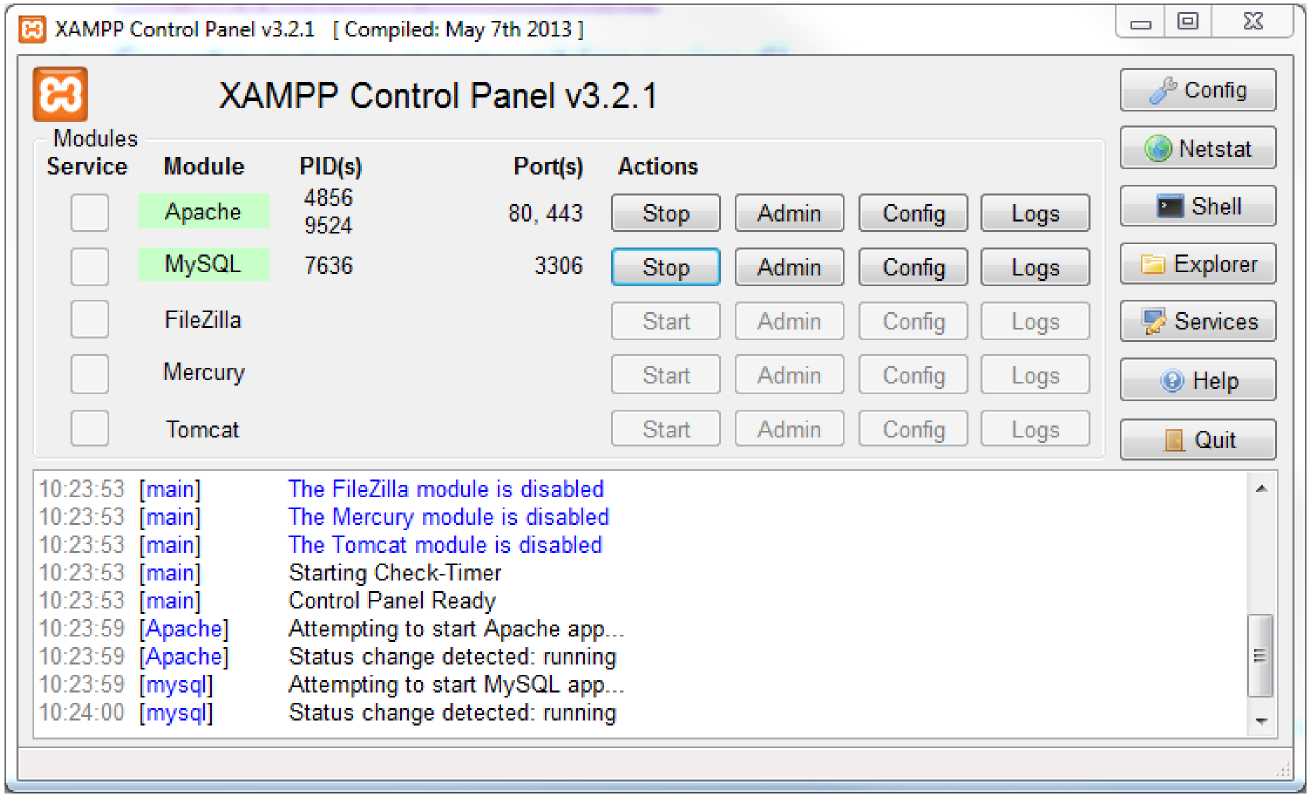

MySQL with your local database(I)

- XAMPP lets you work with your own, local MySQL database
- Make sure you start the MySQL Service in the control center


XAMPP Control Panel v3.2.1 [Compiled: May 7th 2013]
XAMPP Control Panel v3.2.1
Config
Netstat
Shell
Explorer
Services
Help
Quit
Modules

Service	Module	PID(s)	Port(s)	Actions			
	Apache	4856 9524	80, 443	Stop	Admin	Config	Logs
	MySQL	7636	3306	Stop	Admin	Config	Logs
	FileZilla			Start	Admin	Config	Logs
	Mercury			Start	Admin	Config	Logs
	Tomcat			Start	Admin	Config	Logs

```
10:23:53  [main]      The FileZilla module is disabled
10:23:53  [main]      The Mercury module is disabled
10:23:53  [main]      The Tomcat module is disabled
10:23:53  [main]      Starting Check-Timer
10:23:53  [main]      Control Panel Ready
10:23:59  [Apache]    Attempting to start Apache app...
10:23:59  [Apache]    Status change detected: running
10:23:59  [mysql]     Attempting to start MySQL app...
10:24:00  [mysql]     Status change detected: running
```

MySQL with your local database (II)

- Connect to a local database server:
  1. Change to the „…/xampp/mysql/bin“ directory
  2. Enter the following command:
     `mysql -h localhost –u [username] –p`
  3. Enter the password (usually “root”, “admin”, “password” or none)
  4. You should see something like the following:

```
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.5.34 Source distribution

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```
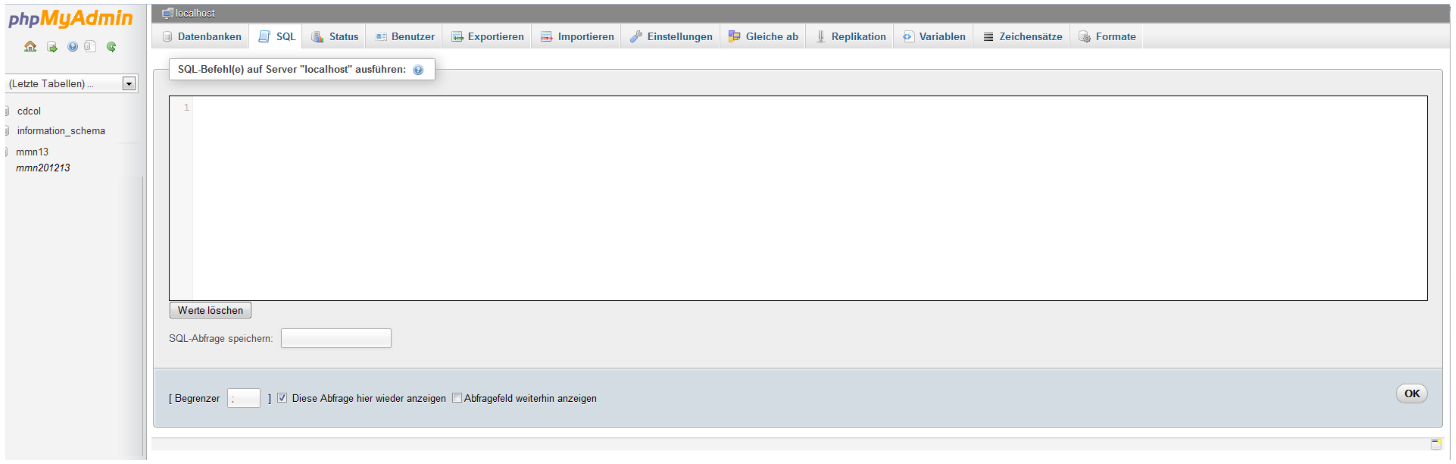

MySQL with your local database (III)

- You can perform work with MySQL through a very common web interface: phpMyAdmin
- Once you've started the Apache & MySQL Servers in XAMPP, enter the following URL in a web browser:
  - http://localhost/phpmyadmin



SQL: Creating a database

- Get an overview on all existing databases:
  ```
  SHOW DATABASES;
  ```
- Create a new database:
  ```
  CREATE DATABASE mydb;
  ```
- Select a database for further usage:
  ```
  USE mydb;
  ```
- Delete a database (be careful!):
  ```
  DROP DATABASE mydb;
  ```

SQL: Creating a table (I)

- Get an overview on all exisiting tables (of a database):
```
SHOW TABLES;
```

- Create a new table
```
CREATE TABLE myTable
(
column_name1 data_type(size) ,
column_name2 data_type(size),
column_name3 data_type(size),
…
);
```

Table: myTable

column_name1	column_name2	column_name3	…

SQL: Creating a table (II)

- Problems with the statement from previous slide:
  - You can add empty entries to the table
  - Entries could be duplicates

- Solution: Create a table with certain **constraints**.
  Define certain rules for columns

- Most important constraints (among many others):
  - `NOT NULL`
  - `PRIMARY KEY` [often in conjunction with] `AUTO_INCREMENT`

SQL: Creating a table (III)

- Create a table with certain constraints

```
CREATE TABLE myTable
(
column_name1 data_type(size) NOT NULL
                             PRIMARY KEY
                             AUTO_INCREMENT,
column_name2 data_type(size) NOT NULL,
column_name3 data_type(size),
…
);
```

Example: Creating a table

```
CREATE TABLE Contacts
(
PersonID int NOT NULL PRIMARY KEY AUTO_INCREMENT,
FirstName varchar(255) NOT NULL,
LastName varchar(255) NOT NULL,
PhoneNumber int NOT NULL,
);
```

Table: Contacts

PersonID	FirstName	LastName	PhoneNumber

SQL: Adding & Retrieving data

- Add entries:

```
INSERT INTO myTable
     (column_name1, column_name2, …)
VALUES
     (value1, value2, …);
```

- Retrieve all entries from a table:

```
SELECT * FROM myTable;
```

- Retrieve only a subset of entries
  - Entries that fulfill certain conditions with the WHERE keyword

    ```
    SELECT * FROM myTable WHERE column_name=value;
    ```

  - Entries from specific columns:

    ```
    SELECT column_name1 FROM myTable;
    SELECT column_name1, column_name2 FROM myTable;
    ```

Example: Add an entry

```
INSERT INTO Contacts
   (FirstName, LastName, PhoneNumber)
VALUES
   ("Max", "Mustermann", 089455544431);
```

Table: Contacts

PersonID	FirstName	LastName	PhoneNumber
1	Max	Mustermann	089455544431

Example: Retrieve data

- Retrieve all data from a table
  `SELECT * FROM Contacts`

- Retrieve entries that fulfill a certain condition:
  `SELECT * FROM Contacts WHERE FirstName="Laura";`

Table: Contacts

PersonID	FirstName	LastName	PhoneNumber
1	Max	Mustermann	089455544431
2	Laura	Stern	070815643593
3	Tanja	Baumann	0895673138
4	Felix	Maurer	0894562897

Break Out

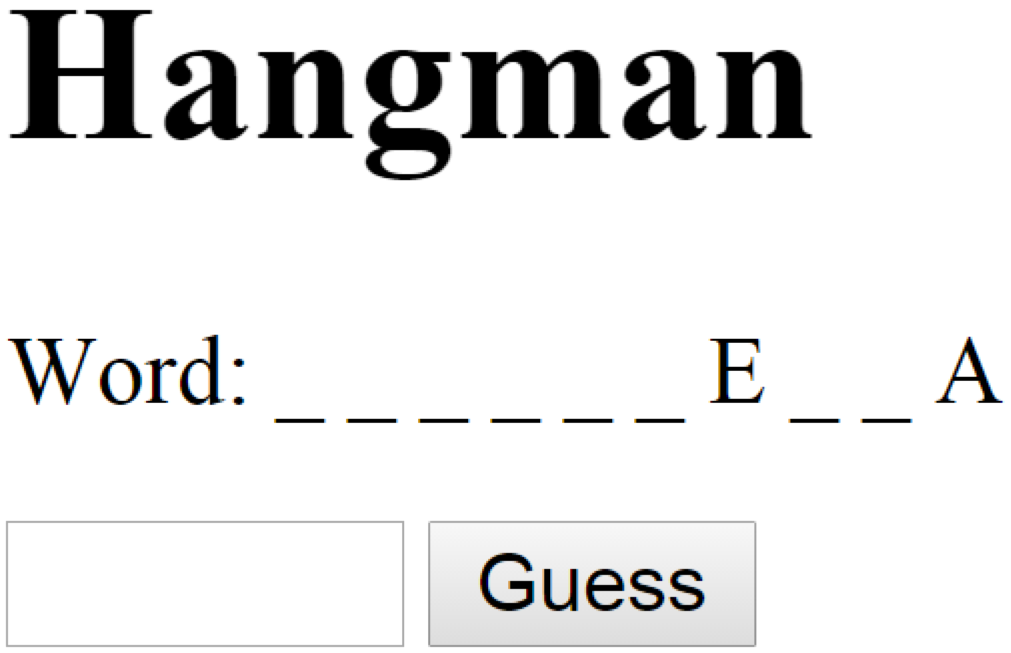
- Use SQL to create a table to store information about music albums
- Each album has:
  - An artist
  - A title
  - A track count
  - A runtime
  - A price
  - A link to a cover image
    (e.g. https://upload.wikimedia.org/wikipedia/en/0/0c/Velvet_Underground_and_Nico.jpg)
  - A Universal Product Code (UPC)
- If you have time, insert some data!

Round-up Quiz

1. True or False: Databases store information permanently.
2. Describe the result:
   ```
   SELECT firstName, lastName FROM contacts;
   ```
3. Spot the error:
   ```
   INSERT INTO contacts VALUES (John, Smith, 5555320039);
   ```
4. What is a “relational” Database?

Thanks!
What are your questions?

Discussion of Assignment 03


Hangman

Word: _ _ _ _ _ _ E _ _ A

Let’s begin with the Assignment!

- Download the assignment sheet
- Start with task 1
- You can collaborate with your neighbor

- Turn in the assignment by November 18th, 12:00 noon via UniWorX