

Week 11 ~ Chapter 8

MySQL Command Line

PHP and MySQL • CIS 86 • Mission College

Tonight's agenda

- Drop the class?
- Why learn MySQL command line?
- Logging on to the Mission College MySQL server
- Basic MySQL commands
- Things we cannot do on the Mission College server, due to privileges, but you can do them on your home computer.
- CA 55 & 56 : More SQL and Database Courses

Drop the class?

- Deadline: Nov. 18
- http://www.missioncollege.edu/class_schedule/2017_summer-fall/documents/calendar_summer-fall_2017.pdf
- You must drop the class yourself. It will not happen automatically and the school and the teacher cannot initiate it.

Why learn MySQL command line?

- SQL means "structured query *language*." If we teach you to use a database but not the language, then we've not taught you true SQL.
- This class is eligible for transfer credit to CSU, so it must satisfy the transfer requirements.
- The employers who are looking for people who know PHP expect them to know MySQL command line also.
- Employers are looking for people who use MySQL from the command line, especially index tuning, schema design, and table normalization. You can't learn those more advanced topics until you understand the command line.

SQLite

- 750 million web sites worldwide
 - Many of these use PHP and MySQL
 - Many of these use other SQL variants like PostgreSQL or Oracle
- 3 billion web browsers worldwide
 - Desktop computers, laptops, tablets, phones, and wearables
 - Modern web browsers use SQLite to implement HTML5 local storage

Connecting to MySQL

- On **MAMP** (Mac)
 - Your user name is `root`
 - Your password is `root`
 - `/Applications/MAMP/Library/bin/mysql -h localhost -u root -p`
- On **WAMP** (Windows)
 - Your user name is `root`
 - Your password is `blank` (just hit return)
 - `bin\mysql\mysql15.6.17\bin\mysql -h localhost -u root -p`
- On the **Mission College** PHP server:
 - Your user name is `ca86_xx` (use your own account)
 - Your password is `php`

Setup for tonight

```
ssh ca86\_xx@php.missioncollege.edu
```

```
password: php
```

```
mysql -h localhost -u ca86_xx -p
```

```
password: php
```

Connecting to MySQL (continued)

- Connecting to the Mission College PHP server
 - (Windows) Putty or (Mac) Terminal
 - `ssh ca86_xx@php.missioncollege.edu`
 - `mysql --local-infile=1 -h localhost -u ca86_xx -p`
 - Put your account number in place of xx
 - `-p` means "prompt me for my password"
 - This is always the safest option
 - `--local-infile=1` lets us load data from files later
- All commands must end with a semicolon (;)
- To exit from `mysql`, type `exit` or `quit`

Frequently used commands

- `show databases;`
- `use <tablename>;`
 - `use CA86_xx;`
- `show tables;`
- `select * from <tablename>;`
 - `select * from randomproverb;`
- `describe <tablename>;`
 - `describe randomproverb;`

Case sensitivity

- SQL commands are not case sensitive.
- In practice, we usually try to put commands and keywords in ALL CAPS and variable names in lower case (database names, table names, field names).

Textbook example – objective

Table 8-1. Example of a simple database

Author	Title	Type	Year
Mark Twain	The Adventures of Tom Sawyer	Fiction	1876
Jane Austen	Pride and Prejudice	Fiction	1811
Charles Darwin	The Origin of Species	Non-Fiction	1856
Charles Dickens	The Old Curiosity Shop	Fiction	1841
William Shakespeare	Romeo and Juliet	Play	1594

Textbook example – create command

```
CREATE TABLE classics (  
  author VARCHAR(128),  
  title VARCHAR(128),  
  type VARCHAR(16),  
  year CHAR(4)) ENGINE MyISAM;
```

Textbook example – describe

```
mysql> DESCRIBE classics;
```

Field	Type	Null	Key	Default	Extra
author	varchar(128)	YES		NULL	
title	varchar(128)	YES		NULL	
type	varchar(16)	YES		NULL	
year	char(4)	YES		NULL	

```
4 rows in set (0.00 sec)
```

Textbook example – insert

Example 8-8. Populating the classics table

```
INSERT INTO classics(author, title, type, year)
  VALUES('Mark Twain','The Adventures of Tom Sawyer','Fiction','1876');
INSERT INTO classics(author, title, type, year)
  VALUES('Jane Austen','Pride and Prejudice','Fiction','1811');
INSERT INTO classics(author, title, type, year)
  VALUES('Charles Darwin','The Origin of Species','Non-Fiction','1856');
INSERT INTO classics(author, title, type, year)
  VALUES('Charles Dickens','The Old Curiosity Shop','Fiction','1841');
INSERT INTO classics(author, title, type, year)
  VALUES('William Shakespeare','Romeo and Juliet','Play','1594');
```

Textbook example – select

```
mysql> SELECT * FROM classics;
```

author	title	type	year
Mark Twain	The Adventures of Tom Sawyer	Fiction	1876
Jane Austen	Pride and Prejudice	Fiction	1811
Charles Darwin	The Origin of Species	Non-Fiction	1856
Charles Dickens	The Old Curiosity Shop	Fiction	1841
William Shakespeare	Romeo and Juliet	Play	1594

5 rows in set (0.00 sec)

Creating a simple table

- `CREATE TABLE phpgroups (id INT, name VARCHAR(10));`
- `DESCRIBE phpgroups;`

Adding records to a table

- `INSERT INTO phpgroups VALUES (51, 'Tiger');`
- `SELECT * FROM phpgroups;`

- `INSERT INTO phpgroups VALUES (52, 'Dragon');`
- `INSERT INTO phpgroups VALUES (53, 'Rat');`
- `INSERT INTO phpgroups VALUES (54, 'Monkey');`
- `INSERT INTO phpgroups VALUES (55, 'Dog');`
- `SELECT * FROM phpgroups;`

Adding many records

- You will usually use this command to load data from a file:
 - `LOAD DATA LOCAL INFILE '<filename>' INTO TABLE <tablename>;`
- The file must be on the Mission College server if you are trying to create a table on the Mission College server. So you may need to upload your file first.
- The table must already exist; it will not be created.
- The number and type of fields in the file must match the number and type of fields in the table.
- The file should be tab-delimited.

Adding many records (continued)

- `CREATE TABLE hrleaders (team VARCHAR(50), runs INT);`
- `DESCRIBE hrleaders;`
- `LOAD DATA LOCAL INFILE '/tmp/hrleaders.txt' INTO TABLE hrleaders;`
- `SELECT * FROM hrleaders;`

Sorting search results

- `SELECT * FROM phpgroups ORDER BY name;`
- `SELECT * FROM hrleaders ORDER BY team;`

Filtering search results

- `SELECT * FROM phpgroups WHERE name='Dog';`
- `SELECT * FROM hrleaders WHERE runs > 12000;`

Changing a record

- `UPDATE phpgroups SET name='Armadillo' WHERE id=31;`
- `SELECT * FROM phpgroups;`

Import a data file

```
CREATE TABLE companycars  
  (license VARCHAR(10), make VARCHAR(25),  
   model VARCHAR(50), mileage FLOAT,  
   year INT);
```

```
LOAD DATA LOCAL INFILE '/tmp/company_cars.txt' INTO  
  TABLE companycars;
```

DISTINCT

- `SELECT make FROM companycars;`
- `SELECT DISTINCT make FROM companycars;`

DISTINCT with aggregate function

- `SELECT count(DISTINCT make) from companycars;`

Simple aggregate functions

- `SELECT * from companycars;`
- `SELECT AVG(mileage) FROM companycars;`
- `SELECT MIN(mileage) FROM companycars;`
- `SELECT MAX(mileage) FROM companycars;`
- `SELECT COUNT(mileage) FROM companycars;`
- `SELECT SUM(mileage) FROM companycars;`

Grouped aggregate functions

- `SELECT make, count(make) FROM companycars GROUP BY make;`
- `SELECT year, AVG(mileage) FROM companycars GROUP BY year;`
- `SELECT year, AVG(mileage) FROM companycars WHERE year>2000 GROUP BY year;`
- `SELECT year, AVG(mileage) FROM companycars WHERE year>2000 GROUP BY year ORDER BY year DESC;`

Copying a table

- <http://stackoverflow.com/questions/3280006/duplicating-a-mysql-table-indexes-and-data>
- Two steps:
 - `CREATE TABLE newtable LIKE oldtable;`
 - `INSERT newtable SELECT * FROM oldtable;`
- Try this:
 - `CREATE TABLE phpgroups2 LIKE phpgroups;`
 - `SELECT * from phpgroups2;`
 - `INSERT phpgroups2 SELECT * FROM phpgroups;`

Things you cannot do ...

... on the Mission College Server

- Create a new database
- Add users
- Change user privileges
- Import and export data using phpMyAdmin

- However, you can do these on your home server for practice.
- We don't need to do know how to do these for our class exercises.

Start MAMP/WAMP

- You cannot do the next few slides on the Mission College server.
- Start MAMP/WAMP:

[MAC]

```
/Applications/MAMP/Library/bin/mysql -h localhost -u  
root -p
```

[WIN]

```
c:\wamp\bin\mysql\mysql5.6.17\bin\mysql -h localhost -u  
root -p
```

Creating a new database

- `CREATE DATABASE nov_09;`
 - NOTE: You **cannot** create a new database on the Mission College PHP server. (You don't have the necessary permissions.)
 - Your supplied database is `ca86_xx` where `xx` is your account number.
 - **Whenever the textbook says to create a new database, just use the `ca86_xx` database on the Mission College server.**
 - If you wish to practice at home, you **can** create new databases on MAMP or WAMP.

- `SHOW databases;`

- `USE nov_09;`

User Privileges

Privilege	Description
ALL	All = alter + create + delete + drop + index + insert + select + update
ALTER	Modify table structure
CREATE	Create databases, tables, indexes
DELETE	Delete records
DROP	Drop databases and tables
INDEX	Create and delete indexes
INSERT	Add records
SELECT	View records
UPDATE	Modify records
USAGE	No privileges

Adding a new user – BETTER

- You cannot do this on the Mission College server.
- <http://dev.mysql.com/doc/refman/5.5/en/adding-users.html>
- `GRANT ALL on companycars.* to 'mary'@'localhost' identified by 'toothless';`
- `SELECT host, user, password FROM mysql.User;`
- `exit`
- `mysql -h localhost -u mary -p`
- `<enter password>`

phpMyAdmin – Export

- You cannot do this on the Mission College server.
- <http://localhost:8888/phpMyAdmin>
- Export (tab)
- Custom – display all possible options
- Save output to a file
- Format: SQL
- Add DROP TABLE statement
- Go

phpMyAdmin – Import

- You cannot do this on the Mission College server.
- Edit the companycars.mysql file and change all instances of 'companycars' to 'companycars2'
- <http://localhost:8888/phpMyAdmin>
- Import (tab)
- Browse your computer: Choose File
- Format: SQL
- Go

Import and Export

- <http://www.itworld.com/article/2833078/it-management/3-ways-to-import-and-export-a-mysql-database.html>
- phpMyAdmin
 - Best for small databases and local databases
 - You cannot do this on the Mission College server.
- MySQL Workbench
 - Better for large databases and remote databases
 - You cannot do this on the Mission College server.
- Command line export: mysqldump

```
mysqldump -u [username] -p [database_name] > [dumpfilename.sql]
mysqldump -u root -p april_16 > april_16.sql
```
- MySQL monitor import: source

```
source cs_data.sql;
```

CA 55 – Introduction to Database & SQL

- This course covers the concepts of relational databases and SQL query language. Students learn to
 - create tables,
 - insert data,
 - update data and
 - retrieve records in a database.
- This course introduces students to widely used database systems such as
 - Oracle,
 - Microsoft SQL server, and
 - MySQL.

CA 56 – Database Essentials and PL/SQL

- This course is an introduction to PL/SQL language. It builds upon the basic SQL course to cover
 - PL/SQL language,
 - stored procedures,
 - functions,
 - packages, and
 - database triggers.

Spring 2018 programming classes

- Python including Advanced Python
- Robotics and Embedded Systems
- C, C++, Java
- Data Structures using Java
- Linux
- Database Intro and PL/SQL
- Mobile Apps (my class on Saturday mornings)
- JavaScript (cross listed between CA and GDS)

Spring 2018 Graphic Design classes

- Intermediate Web Design (GDS 46)
- Wordpress and CMS
- Page Layout & Typography
- Adobe Illustrator
- Adobe InDesign
- Photoshop (and Advanced Photoshop)
- User Experience
- Packaging Design
- Portfolio

Winter 2018 classes

- Python
- Linux
- Mobile Game Design and Development
- Photoshop