

Web Programming (CSci 130)

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Learning outcomes

■ Goal

- Description of MySQL with PHP with AJAX
 - e.g. Retrieve information from MySQL to populate a form in HTML
- Example of requests for the manipulation of tables
 - SQL syntax
 - Reminder from **databases** classes
- To stress the decomposition of different steps
 - Form → Database
 - Database → Form

Code analysis

- Goal
 - To deal with the database in a transparent manner
 - By only using the classes defined in PHP
- Examples
 - main_test.php to test functions
 - rdbms.php
 - CreateDB
 - DeleteDB
 - InsertTable
 - InsertTable1
 - InsertSTR
 - InsertItem
 - InsertItems
 - InsertItems1
 - GetTable
- It shows multiple PHP functions /!\

PHP + AJAX

- Example from previous weeks
 - An HTML form to access/fill objects of the class Student
- Form → AJAX → PHP → Object → JSON → AJAX → Form
- Database query
 - Retrieve an element based on an index
 - Client (JS code): `httpRequest.send('index=' + index);`
 - Server (PHP code): `$_POST(index)`
 - Form (HTML) → AJAX → PHP
 - In PHP
 - Open the database
 - Search for the element (query)
 - Query result → Object
 - Object → JSON
 - JSON → Object → Form (HTML)

Verification with PHPMyAdmin

- XAMPP
 - Apache
 - Admin
 - PHPMyAdmin

Verification with PHPMyAdmin

■ The table student:

localhost/phpmyadmin/sql.php?server=1&db=mydb1&table=student&pos=0

Server: 127.0.0.1 » Database: mydb1 » Table: student

Showing rows 0 - 9 (10 total, Query took 0.0012 seconds.)

SELECT * FROM `student`

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

		pkey	first_name	last_name	dob	address	id	current_gpa	current_units	reg_date
<input type="checkbox"/>	Edit Copy Delete	1	MMo54bJ7IQ	EZATJdl7sC	1994-5-24	GLeG8K0ppwDt69j0Ez7h	10130	1.0	38	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	2	ZIFrr96Cuk	iLlg03APtY	1985-3-9	lwFLDnM78GE0sApPTe3l	10380	4.0	43	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	3	FcBerpko2y	3OPU1QmnEi	1951-6-7	QVt3ckg0J9NFB9SO44U3	10170	1.0	58	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	4	444mqdO0li	2WoaY7JzY1	1955-8-9	Noy0uJEScjwHRjRRLWko	10378	1.0	43	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	5	jBnMsSC5y2	yRldHUIUQH	1984-6-14	fT4kjAdRR9Hxbe6nEZO2	10286	3.0	7	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	6	ZcUDuZmiiy	MKP2fqDSwP	1989-1-5	892Yt3Z9tTdjOH0QLLP3	10381	2.0	59	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	7	LGcRYyyH1Z	06fW6ArOJa	1956-1-23	TE4lcmYEpvpCWHvigDRz	10113	3.0	25	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	8	5hOXSiqz5z	gKKv5hWBMr	1980-11-14	q2fiDPJ77diZMVDra3Qh	10102	4.0	32	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	9	qle1xprWp5	5OMjYgvdQl	1961-11-24	UkHMcj2eK72Uq0WxSLil	10078	2.0	10	2017-11-09 13:40:16
<input type="checkbox"/>	Edit Copy Delete	10	3oH0uwUIBz	OQUMqoizQM	1957-9-4	gzf7gPT2zHLIPNxxk48Ss	10291	1.0	33	2017-11-09 13:40:16

Check all | With selected: Edit Copy Delete Export

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Query results operations

Print Copy to clipboard Export Display chart Create view

SQL

- You can run SQL commands directly in PHPMysqlAdmin
 - → Check to see if it works with an example
 - → Reuse the command in PHP
 - Just a string to copy/paste as the content of the query
 - When the query is selected by the user

The screenshot shows the PHPMysqlAdmin interface for a MySQL database. The top navigation bar includes tabs for Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, Tracking, and Triggers. The main content area is titled "Run SQL query/queries on table hubdb2018.student:". The SQL query editor contains the text: `1 SELECT * FROM `student` WHERE 1`. Below the editor are buttons for SELECT *, SELECT, INSERT, UPDATE, DELETE, Clear, Format, and Get auto-saved query. There is a checkbox for "Bind parameters" and a "Bookmark this SQL query:" field. On the right, a "Columns" list shows the table's structure: idx, first_name, last_name, dob, address, id, current_gpa, current_units, and reg_date. The bottom status bar includes a "Delimiter" dropdown set to semicolon, checkboxes for "Show this query here again", "Retain query box", "Rollback when finished", and "Enable foreign key checks", and a "Go" button.

Example

- Access through a web page a list of Students

- Files

- init_database.php
 - Create a database of students
 - student.php
 - Same as previous week (definition of the class Student)
 - index.html
 - HTML form with JS and AJAX
 - getobject.php
 - Retrieve the index, connect to the database, request the content of the table, return the desired element into a JSON object (string sent back to the client)

More requests

- Code:
 - `mysql_request_examples.php`
- Warning
 - There are definitions in the php code that you need to know !!

PHP / MySQL

- Some code can be placed directly within MySQL requests
- Remark
 - If you can do it in PHP, keep it in PHP
 - Example
 - Output of a request is an array of rows
 - Selection of an array

Debugging

- You get no output from PHP
 - `Alert(xmlhttprequestobject.responseText)`
 - Correct type?
 - No display, exception → Problem with PHP
 - Create a **stand alone PHP** function
 - PHP function in a single PHP file
 - Specify the variables as expected from the `$_POST[x]`
 - Verify that the PHP function works
 - Produces the right output (`echo $output;`)
 - Bug in PHP → You don't get a clean message back on the client side if it is via AJAX
 - Add the expected inputs from AJAX
 - `$_POST[x]`
 - **Always** check that what you get is what you expect
 - `isset()`, `isint()` ...

Debugging

- You cannot run the SQL query through PHP because
 - Syntax error
- → Use the phpmyadmin interface to run the query
 - Debug the syntax in phpmyadmin **then** update the PHP code
- Avoid useless commented code
 - If it is useless and it doesn't work, then remove it !
 - If it corresponds to something, then add a condition that can allow you to use it in a clean way
- Asynchronicity
 - AJAX / PHP → Think in terms of **event**
 - After you make the request to the server: no code !
 - Next part: the function associated to the response !

Debugging

- Group project

- Decomposition of the project into **independent** entities
- You need to agree on the type of data to be exchanged
 - “Packaged” in JSON
- Example
 - 1 person for **JS/HTML** files
 - What are the queries from the user?
 - 1 person for **PHP** files
 - What is provided as an input?

Conclusion

- PHPMyAdmin
 - To verify the database and its content
 - Never **EVER** assume a db query will succeed!
 - To test SQL queries
 - If you get a bug related to the syntax → Do not rerun everything with PHP
- Importance of the decomposition of the different elements
- Potential improvements:
 - Starting from the given example to retrieve an element in the table
 - Add the functionalities:
 1. Find all the students with a GPA > 3
 - Display the students (allow previous/next)
 2. Find all the students who have less than 20 units
 - Display the students (allow previous/next)

Next session

- Next session:
 - MySQL transactions
 - **Login**
- Further reading
 - See links on Canvas
 - <https://mariadb.com/kb/en/library/training-tutorials/>
 - <https://dev.mysql.com/doc/refman/5.7/en/tutorial.html>
 - <http://www.mysqltutorial.org/>