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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

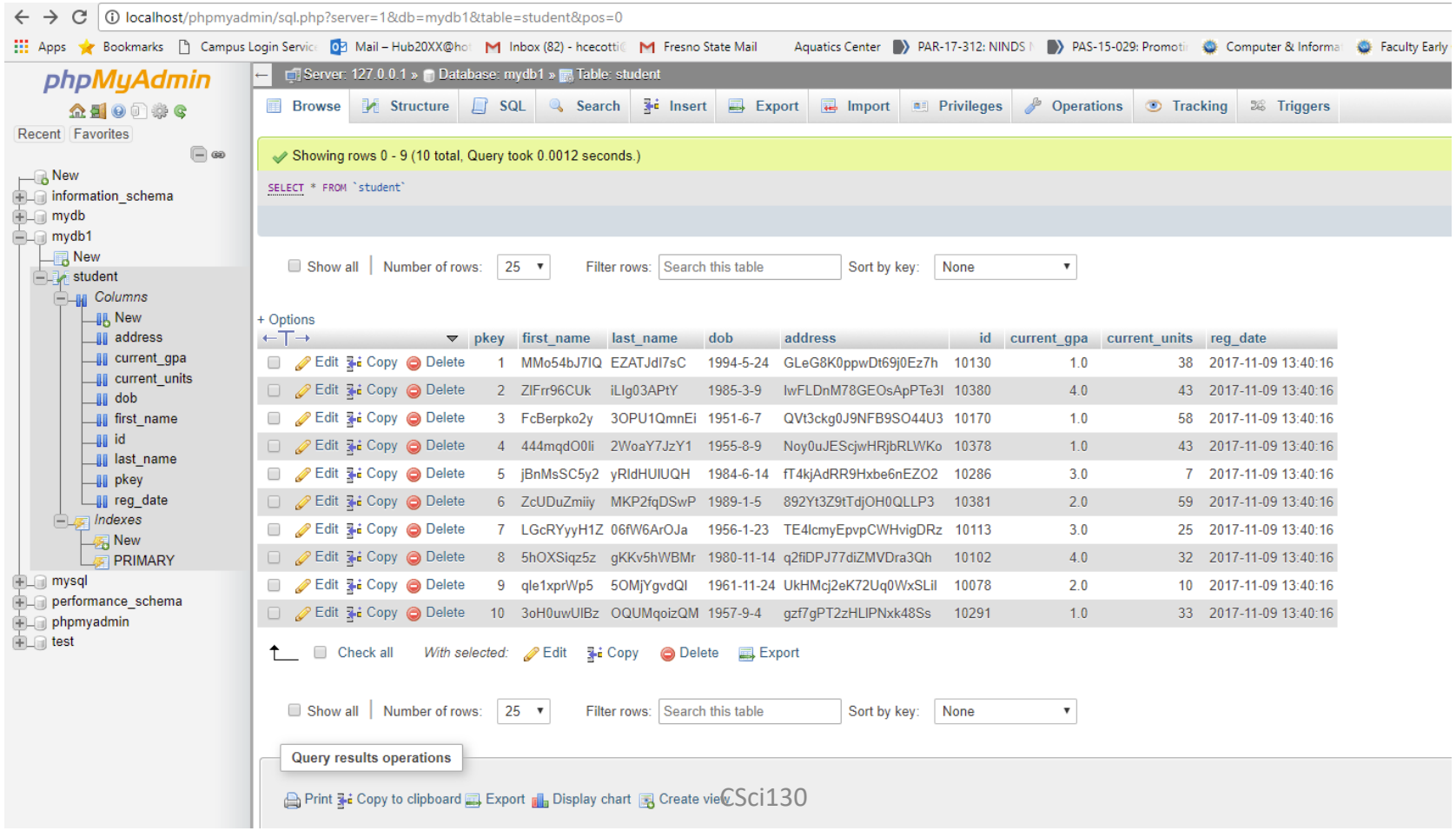
- Example from previous weeks
  - An HTML form to access/fill objects of the class Student
- Form → AJAX → PHP → Object → JSON → AJAX → Form
- Database query
  - Retrieve an element based on an index
    - Client (JS code): httpRequest.send('index=' + index);
    - Server (PHP code): $_POST(index)
 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

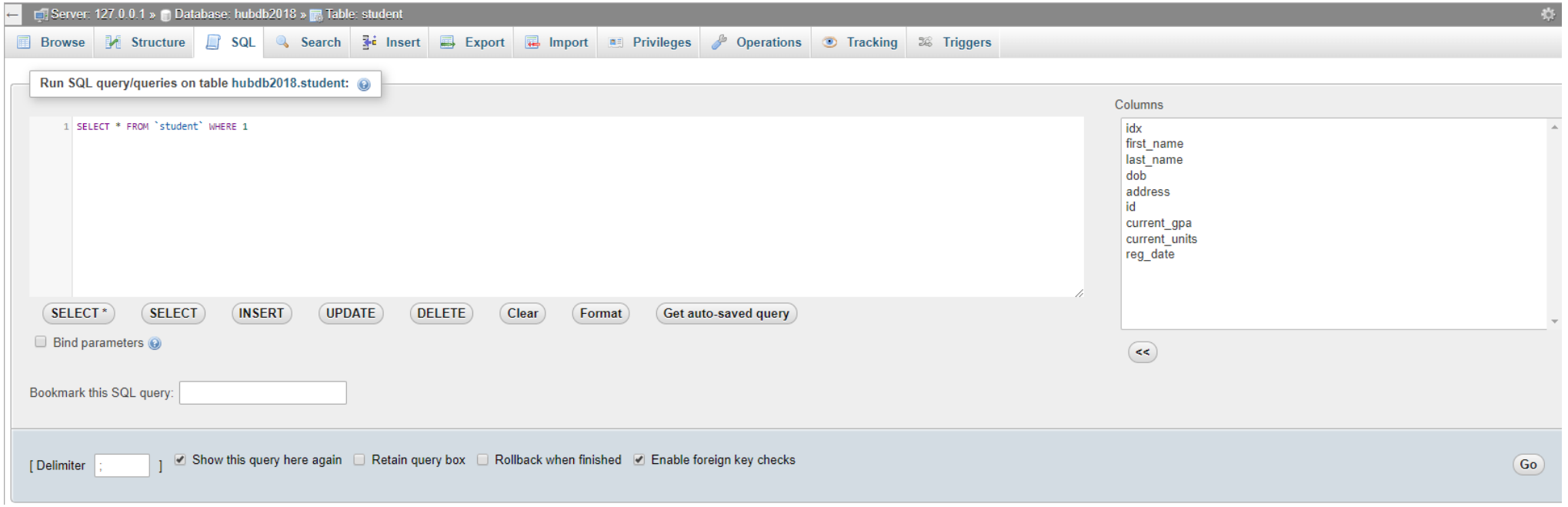
Verification with PHPMyAdmin

- The table student:



SQL

- You can run SQL commands directly in PHPMyAdmin
  - → 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



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
- Asynchronisity
  - 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/