CS4014 Lab 4

Material covered by this lab

- Setting up an account on an SQL server
- Copying a database
- Running queries on an SQL database with PHP

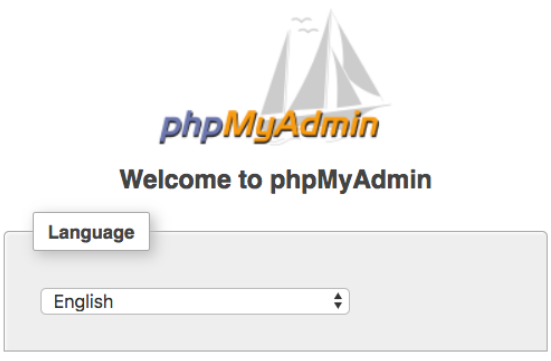
SQL Practical Exercises (Do in lab)

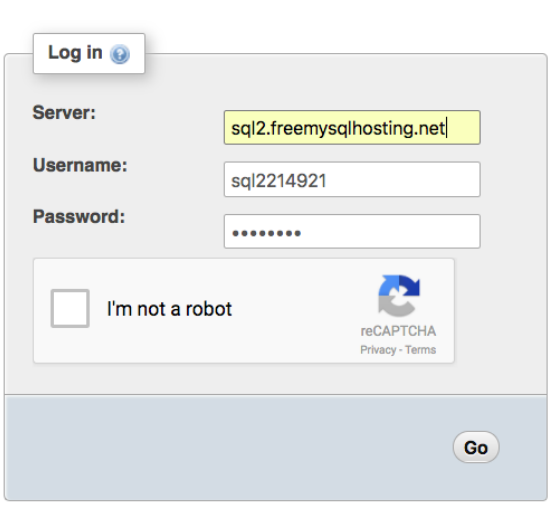
1. For this lab you will need to use an SQL server. It doesn't matter which one you use, for example, if you set up a WAMP server from last week's lab you can use that, but if you don't already have one, you can use one of the following:
   - Free mySQL Hosting
   - 000Webhost
   - Free MySQL Database

     The key thing is that your database server provides **PHPMyAdmin**. This is a web front end for MySQL that will make adminstering and interacting with the database easier as you can work directly with it, as well as writing queries in PHP. The full project will use the database server on hive.csis.ul.ie which provides PHPMyAdmin.

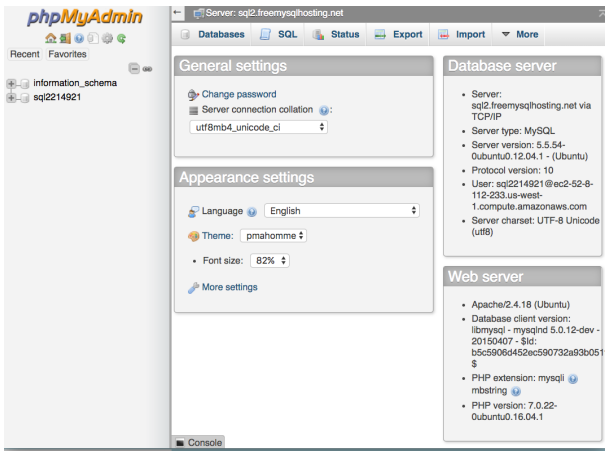
     Note that there is often a delay of up to an hour between setting up the account and database and actually getting access to it, so do this before the lab. The examples below were generated using freemysqlhosting, so if yours looks completely different, try freemysqlhosting; you don't have to keep using it for the rest of the semester.
2. Once you have your database set up, note down the following:
   - Servername
   - Username
   - Password
   - Databasename

   These correspond the variables used in the sample code. You may find it useful to download all of the PHP and database examples; you can do this by downloading a zipfile of the from here.
3. When you set up your database, you will have been given details on how to connect to PHPMyAdmin (by e-mail from the provider) or, if you set up wamp, you should be able to use http://localhost/phpmyadmin. We will do this and set up a new database. If it isn't clear to you how to connect, talk to one of the TAs, but you will see a screen like this (click to see a larger version):





   Enter your details, prove you're not a robot and click on GO.
4. When you log in, you will see a screen like (although not necessarily identical) to the one below (click for a larger image):

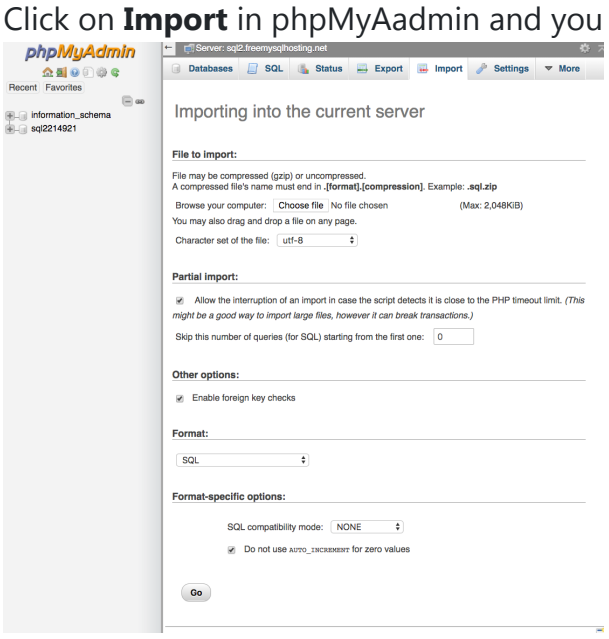


There will be two databases, **information_schema** and your own database. In this case, our database is called **sql2214921**. *Yours almost certainly won't have this name!*

5. A **database dump** is a copy of a database. You can download a copy of the database from this week's lecture by saving this link.
6. We want to import this database into your own database so you can interact with it. However, first you must manually edit the dump file that you just downloaded and change the name **sql2214921** to your own database name. There are two lines you need to change, both of which are together near the top of the file, these are:

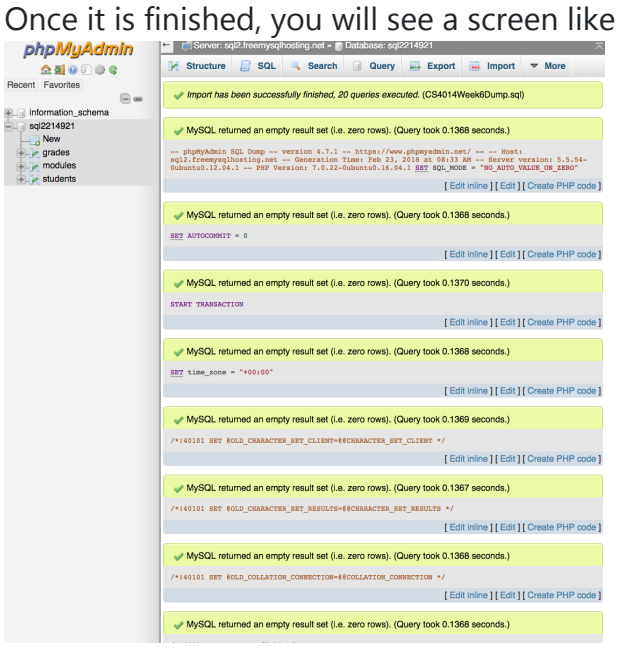
```
CREATE DATABASE IF NOT EXISTS `sql2214921` DEFAULT CHARACTER SET latin1 COLLATE latin1_swedish_ci;
USE `sql2214921`;
```

7. Click on **Import** in phpMyAadmin and you will see a screen like this (click to see a larger version):



Select the edited dump file and click GO, there's no need to modify any of the options -- it knows what it's doing!

8. Once it is finished, you will see a screen like this (click to see a larger version):



What we are seeing here is the result of mySQL processing the database dump; it does this by creating the tables and then running the queries needed to populate them so that they are the same as the original. If you scroll down you will see that there are a bunch (20 or so) queries

9. Now that we finally have our database, explore the interface. In particular, the **Structure** tab will let you browse the ables, the **Query** tab will help you construct queries and the **SQL** tab will let you run arbitrarily complex queries. Use these three tabs to help you with the following questions.
10. Write SQL queries for each of the following, note that you will need to research such functions as **MAX**, **COUNT** and **AVG** for these.
    1. What is Paddy's student ID?
    2. List all the student ID numbers who have done CS4014
    3. List all the student names who have done CS4221
    4. What is average grade in CS4221?
    5. What is the highest grade in CS4086? What about the lowest

PHP/SQL Practical Exercises (Do at home)

11. For each of the queries from Q10, write a PHP script to execute them and print the results on the screen (don't worry about putting the results in a web browser for the time being). You may find it helpful to modify some of the example code from the lectures (and downloadable from here). You will need to research **SELECT AS** for the final two questions. Here are some hints, but use them sparingly!
    - Clue 1
    - Clue 2
12. Modify your answer to Q11 so that it outputs its answer to a webpage. You can see the code executing here.
13. When you're satisfied that you have all this working, copy everything onto hive and ensure that it is working there. If it is, congratulations! The rest of the project will be a breeze!

The solutions to the PHP/SQL questions are available from this zip file. This is the answer to question 12, but contains the answers to the other questions too.

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