Databases and the Web – Exercise 3

This week is a bit of a mopping-up exercise to ensure we're all up to speed with ex's 1 & 2.

Following ex's 1 & 2 you should know how to back-up and recreate a database using PHPMyAdmin, understand the structure and relationships between the three **`world`** tables and have a vague idea how to write a basic PHP page … After this exercise you should have regained your familiarity with SQL (`JOIN` *etc.*)

Task 1: Quickie from last week

If you have used **`ENUM`** as most appropriate column type in the **`country`** table in **`world`** for the column **`Continent`** then the sort order is determined by the order in the **`CREATE`** definition, *e.g.*

```
SELECT name,continent FROM country ORDER BY continent
```

may not give the sort order you expected … try it!

Can you find a way to fix this? **Hint**: Africa should be first -- search the MySQL documentation or the module forum for a solution.

Task 2: Try some queries using *joins* on **`world`** tables:

1. List the 20 countries in the world whose official language is Spanish.
2. *Count* all of the countries in the world whose official language is English.
3. How many people in the world speak Spanish as their official language?
   How about English?
4. List the languages and total world's population that speaks it in billions (US-style billion: 1 000 000 000), ordered by decreasing total population (for ease of use you can use the **`LIMIT`** keyword to show just the top 20.)

   What's the most spoken language with nearly 1.2 billion speakers?

   Where do English and Spanish come, with 0.35 and 0.36 billion speakers, respectively?

   Kudos to the 1st poster of a correct query that *doesn't* use a subquery ;-)
5. List the total number of languages spoken in each of the world's countries, ordered by decreasing GNP (gross national product) together with the name of the capital city (*e.g.* unsurprisingly the first row should be USA with the highest GNP, 12 spoken languages and capital city Washington).

   The maximum number of languages spoken per country seems to be 12 (according to this sample dataset – YMMV!) What's the country with the smallest population with 12 languages?

Task 3: Test SUSE and StudentNet PHP error messages

1) Whenever you make a syntax error in a PHP script or the script has difficulties connecting to MySQL you *should* see an error on the *client* in the web page.

a) Try it – create this PHP script called `error1.php`

```
<?php
      echo '<h1>Heading 1</h1>
?>
```

(Can you spot the error?)

i) Save it in "public_html" and open it in Firefox on Linux (http://localhost/~linux/error1.php)

ii) Upload it to StudentNet (inside the "www" folder) and open that in the Firefox/Internet Explorer from StudentNet (http://studentnet.kingston.ac.uk/~kxxxxxxx/error1.php)

If necessary, you can turn error reporting on with

```
ini_set("display_errors", 1);
include("file_with_errors.php");
```

but this can't resolve the above problem *because* PHP is parsed and not executed until a given script is syntax-error free ☹

2) OTOH, try an invalid database connection (a *run-time* error):

a) Try it – create this PHP script called `error2.php`

```
<?php
      mysql_connect('studentnet');
?>
```

(What's up with that?)

i) Save it in "public_html" and open it in Firefox on Linux (http://localhost/~linux/error2.php)

ii) Upload it to StudentNet (inside your "www" folder) and open that in the Firefox/Internet Explorer from StudentNet (http://studentnet.kingston.ac.uk/~kxxxxxxx/error2.php)

iii) Now add the error reporting *e.g.* to error3.php:

```
<?php
   ini_set("display_errors", 1);
   include("file_with_errors.php");
   mysql_connect('studentnet');
?>
```

Save it in "public_html" and open it in Firefox on Linux (http://localhost/~linux/error3.php)

iv) Upload it to StudentNet (inside the "www" folder) and open that in the Firefox/Internet Explorer from StudentNet (http://studentnet.kingston.ac.uk/~kxxxxxxx/error3.php)

On a *development server* "error_reporting" should be *on* so you can see what's going-on but on a *live server* it should be *off* and your application code should handle all errors... For this module it'll be easiest if it's just on all of the time ☺

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Task 4: Use PHP to list the capital cities from all of the world's countries

1. Create a *valid* (X)HTML skeleton, with a DOCTYPE, `<head>`, `<body>`, `<h1>Capital cities</h1>` *etc.*
2. List the capital city names within an unordered list, <ul>:
    a. Open the `<ul>`
    b. Inside it add a `<?php ... ?>` block
    c. Inside that add the code necessary to
        i. Connect to MySQL (using one of "`mysql_`", "`mysqli`" or "PDO").
        ii. Execute the appropriate query to list the capital cities of every country together with their country name.
        iii. Loop over the result set to echo the data *e.g.* as "`<li>London is the capital city of United Kingdom</li>`".
        iv. Free-up the result set memory and close the database connection.
3. Finish the HTML in such a way that it validates, *e.g.* if you host it on StudentNet and pass the URL to http://validator.w3.org/unicorn/ it should be valid (X)HTML, HTML4 *Strict* or HTML5...

Task 5: List all of the cities from the world's countries

If you have time in the lab, fine, otherwise this is a directed-study task:

1) Produce a page similar to "Task 4" that queries your **`world`** database and displays all of the country names as an unordered list, sorted by continent.

2) Arrange it so that the continent name also appears at the head of each "group" of country names – you can do this programmatically using a simple **`if`** test. (See this example and its source code but come up with your own markup.)