MySQL practicals

N.B.: before you leave the practical sessions please show the demonstrators that you have completed the proposed exercise

Exercise FIVE

OBJECTIVES: more SQL queries, stored procedures, parametric queries, data export/import.

Task 1 - Using the tables *students*, *courses* and *student_taking_course* you created in previous weeks, write (each in a different query tab) and execute the SQL queries that retrieve the following information (verify that the correct results are returned based on the data contained in your database):

1. The number of students;
2. The number of different surnames of students;
3. The average cost of courses;
4. The number of students that take the course EXL20;
5. The courses ordered by cost;
6. The name of courses with a code that ends with 20;
7. For each studentid, the average cost of courses taken by such a student

Task 2 – In your database you can create **stored procedures** which include queries. For example, the following command creates a stored procedure called **null-email** that contains the query that returns the students with null email address:

```
CREATE PROCEDURE `null-email`()
BEGIN
SELECT *
    FROM students
    WHERE email is null;
END
```

NOTE: If the command above does not work on your system, you may need to use the command below instead.

```
DELIMITER //
CREATE PROCEDURE null_email()
BEGIN
   SELECT * FROM students
   WHERE email IS NULL;
END //
DELIMITER ;
```

For each of the queries in Task 1, create a stored procedure in your database by modifying the example above. You can create a stored procedure in the active database schema by clicking on the corresponding icon in the main menu or, alternatively, from the Navigator panel by right-clicking on *Stored Procedures* (under the database schema you want to use).

Remember to click on APPLY to **save** all the stored procedures you created. They will all appear in the Navigator panel under the corresponding database schema. **Execute** these stored procedures by clicking on the icon next to the name of each procedure. Alternatively you can execute a stored procedure by opening a query tab and invoking (calling) the procedure. For example if I open a query tab and type:

```
call mydb.null-email();
```

and execute this statement via the menu bar, the *null-email* stored procedure in the database called *mydb* is executed.

Task 3 – A **parametric query** is a query that takes some parameters in input. For example the stored procedure created by the following statement:

```
CREATE PROCEDURE `param_id`(IN p_id INT)
BEGIN
SELECT *
    FROM students
    where studentid=p_id;
END
```

contains a parametric query that returns all information related to the student whose *studentid* is equal to the value given in input, i.e., this query requires a *studentid* as input parameter. Note that the datatype of this input parameter has to be compatible with the datatype of studentid. **Create** this stored procedure and **execute** it. You will be prompted with a window; enter a *studentid* in order to obtain the result.

Task 4 – Create the stored procedures corresponding to the parametric queries that return the following information:

A. Studentid of students with a given student name;
B. Name of course with a given course code;
C. Name of courses taken by students with a given last name;
D. The number of students with a given last name;
E. The number of courses with a given cost;
F. The number of students taking a given course;

Task 5 – Data export/import.

1. To export your database onto a file with extension .sql, from the main menu: Server → Data export. Export onto a single **self-contained file** including all components (stored procedures, etc.). Use a meaningful name and choose an appropriate directory on your laptop where you want to save it.
2. Create a new database, e.g., called *newdb*
3. Data import: from the main menu: Server → Data import. Try to import the .sql file you created into your *newdb* database. All data and functionality you created (eg. stored procedures) should be there.

Task 6 – Creating a diagram of a DB.

Select a DB in your application by clicking on it. In the main menu, click on Database → Reverse Engineer: this functionality allows you to create an ER diagram of your database – this will be useful for your assignment. You can create a pdf file containing this diagram by clicking on File → Print to file.