Introduction to the environment

Objectives

This session aims at introducing the students to the course set up. It includes:

- The general rules to be followed at each laboratory session,
- Get familiar with those tools needed to successfully prepare and perform most of the laboratory sessions. Namely:
  - your Oracle account,
  - the Moodle course and
  - the Learn-SQL tool

Required knowledge

This course deepens on relational databases and therefore, basic knowledge about relational databases is mandatory. Namely:

- Relational model (data structure, operations and integrity constraints)
- Relational algebra and SQL
- Logical database data components (schemes, tables, domains, assertions and views)
- Database control components (stored procedures, triggers and privileges)
- SQL programming (including JDBC)
- Basics on designing relational databases
- Basics on transactions and concurrency
- Basics on physical storage structures and access methods

Thus, it is assumed that students already took an introductory course on databases.

SQL queries style in this course

You must design your queries to match the following conditions:

- Remember to put the word `DISTINCT` if and only if it is possible that the query returns two identical rows
- Don't forget to use `ORDER BY` . If it is needed and you don't put it, you will get messages that have nothing to do with the mistake
- As quality rule, try to avoid subqueries whenever it is possible
- You are **not** allowed to use the following constructions:
  - `SELECT in the FROM` or `SELECT` clauses.
    - You are though allowed to have subqueries (`SELECT in the WHERE` or `HAVING clauses`)
  - Combinations of aggregation functions such as `COUNT (COUNT. ..))` , `SUM (COUNT. ..))` and the likes
  - `UNION` whenever you can avoid it
  - Non-standard functions (such as NVL)
  - The `CASE` keyword
- `JOIN` syntax is as follows:

- `INNER JOIN: SELECT ... FROM t1 JOIN t2 ON condition`
- Left outer join: `SELECT ... FROM t1 LEFT OUTER JOIN T2 ON condition`
- Right outer join: `SELECT ... FROM T1 RIGHT OUTER JOIN T2 ON condition`
- Full outer join: `SELECT ... FROM T1 FULL OUTER JOIN T2 ON condition``
- Cartesian product: `SELECT ... FROM T1 CROSS JOIN T2`

You can combine them and build expressions like: `SELECT ... FROM T1 CROSS JOIN T2 LEFT OUTER JOIN T3 ON condition`

Tools

There are three main tools you should be familiar with at the end of this session:

- Moodle: This course is fully scheduled in a Moodle course, available at: https://learnsql2.fib.upc.es/moodle
  - Relevant general information about the course can be found there:
    - Teaching guide,
    - Contact information: we strongly suggest to communicate with the course teachers should you happen to go through problems to follow the course,
    - Evaluation information and
    - Rules about the glossary and the glossary itself.

Any activity to be undertaken during the course will be properly announced there. Thus, be sure to frequently check it. Three kinds of activities can be found there:

- **Lectures**, where a proctor introduces new theoretical concepts to the students,
- **Self-study activities**, where the student goes through some materials on his own. These sessions are assessed by means of evaluation activities that can be either on-line (i.e., to be found in the Moodle course) quizzes, on-line activities to be performed with the Learn-SQL tool (see below for further information) or brief evaluations in paper during lecture time.
- **Lab sessions**, where theoretical concepts introduced either during lecture or self-study time are put into practice. These sessions are based on the Learn-SQL tool and Oracle.

Each activity will be properly described in a document stating the activity goal, its description, required knowledge to carry it out, constraints regarding the activity and the deliverables.

- Learn-SQL: This is a tool integrated in the Moodle course (those activities itemized by a SQL icon) that automatically assess your answer to a given activity. It is used both to evaluate self-study activities and lab sessions.
- Oracle: This is the RDBMS used during the course to practice theoretical concepts. Before answering any Learn-SQL activity, you are advised to test your answer in your Oracle account. Obviously, you can also use it to test and generate your own exercises. To access Oracle, do:

> log in a Linux session in a lab room and start DBeaver, a generic database client installed in the FIB systems. You can use DBeaver to create objects in your Oracle database and, in general, execute any SQL sentence.
> To connect to the Oracle server, you must create a connection with the following configuration:
>
> > Host: oraclefib.fib.upc.es
> > SID: ORABD
> > Port: 1521

> > Username: the one you use at any LCFIB system
> > Password: DBddmmaa, being “ddmmaa” your birth date
> > For instance, 030288 if you were born on February 3rd, 1988.
> > Should you be required to provide the Oracle driver, you can find it in the “Introduction to the environment” topic in the LearnSQL page (in the same place where you found this file you are reading).

> To work from home, you can
>
> > (1)
> > obtain the Oracle server visiting
> > http://edelivery.oracle.com/
> > You must register using your FIB email address.
> > You may also be interested in visiting
> > http://academy.oracle.com
> > where you will find educational material and additional software.
> > For more details, see http://docs.oracle.com
>
> > (2)
> > download and install DBeaver, easily found on internet.
> > In order to connect to the LCFIB server from home, you also have to properly set up a VPN client. Look here for further details: https://serveistic.upc.edu/ca/upclink

- Should you experience difficulties, please ask for help through

You can access Oracle manuals as explained in the Moodle course page.

Laboratory sessions

It is strongly recommended to carefully read the “Information about the laboratory sessions” document. You can find it in the General Information at the top of Moodle.

Activities

After reading (and understanding) this document, answer the Learn-SQL questionnaire attached to this Moodle activity.
Use your Oracle account to test and validate your answer before assessing it through Learn-SQL.

Delieverables

This activity is intended to help you understand how lab sessions are conducted, and also help you getting familiar with Learn-SQL. Therefore, there are no deliverables for this activity.