

Facultad de Informática. Computer Science Engineering Bachelor's Degree.
Databases 2018-2019. Group I. SQL Exercises (I): DDL and DML data modification sentences.

Exercise 1. Implement as SQL table creation sentences the following DB schema for a library network.

Publication(**ISBN**, **Authors**, Title, Language, Publisher)
(Foreign key referencing Publisher)

Publisher(**Name**, Address, PhoneNumber)

Member(**MemberId**, Name, TaxId, email, District)
(Foreign key referencing Library)

Periodical(**ISBN**, Regularity)
(Foreign key referencing Publication)

Book(**ISBN**, Edition, Year)
(Foreign key referencing Publication)

Library(**District**, Address)

Book.Copy(**ISBN**, **District**, **CopyNumber**, PurchaseDate)
(Foreign keys referencing Book and Library)

Borrowing(**MemberId**, **BorrowingDate**, ISBN, District, CopyNumber, BorrowingDays)
(Foreign keys referencing Member and Book.Copy; The length of the borrowing must be greater than zero)

Periodical.Copy(**ISBN**, **District**, **CopyNumber**, PurchaseDate)
(Foreign keys referencing Periodical and Library)

Save the sentences written in the SQLDeveloper worksheet on a file to have them available for next sessions.

Exercise 2. Once you have created the DB tables, add the following rows to them in the order they are given:

```
Publication = {{ '978-84-782-9085-7', 'R. Elmasri, S.B. Navathe',  
                'Fundamentals of Database Systems', 'English', 'Addison-Wesley' }}  
Publisher   = {{ 'Addison-Wesley', 'Ribera del Loira, 28. 28042 Madrid', 911234567 }}
```

¿What message does appear as a result of the data insertion? ¿How can we fix it?

For entering data into the database you can use the following **suggestions**:

- Check that primary and foreign keys constraints hold before inserting a new row.
- You can query the data in a table using the following basic sentence (replace *table* by your table name):

```
SELECT * FROM table;
```

- You may need to change date representation format for setting column of date type:

```
ALTER SESSION SET NLS_DATE_FORMAT = 'DD-MM-YYYY';
```

and you should use function `TO_DATE('date')` in an `INSERT` sentence to convert a string containing a date to a date object

- When you finish entering data, execute `COMMIT;` to confirm the data in the database.
- **Arrange the SQL sentences in the script so that you can recreate the DB from scratch (for example, in your laptop computer) with just one click:** First configuration parameters such as date format, then drop table sentences, then create table sentences, insertion sentences, and finally queries and other sentences.
- Remember to save the script in a text file to have it available for next sessions.

Exercise 3. Insert data in the tables. Do it in the right order to avoid error messages. Try inserting the following information:

- You have to enter data regarding two public libraries in Madrid: Retiro Public Library, located in 189, Dr. Esquerdo; and Moratalaz District Library, located in 5, Corregidor Alonso de Tobar.
- Retiro Library has two copies of the book:

A. Silberschatz, H. F. Korth, S. Sudarshan. **Database Management Systems** (3rd Ed), McGraw-Hill, 2003. ISBN: 0-07-115110-9

and one copy of the book:

R. Elmasri, S.B. Navathe. **Fundamentals of Database Systems** (5th Ed). Addison-Wesley, 2007. ISBN: 978-84-782-9085-7.

Book copies information is stored in table `Book_copy`. You must insert a row for each copy of each book in each library. Column `CopyNumber` must contain a consecutive number starting from 1 for each copy of a book. Do not use a sequence to generate it.

- Moratalaz Public Library has a copy of Silberschatz's book and two copies of Elmasri's book.
- Retiro Library is subscribed to *Novática* journal (which is a periodical publication), published by ATI quarterly, with ISSN 2444-6629 (note that periodicals contain articles from several authors that differ in every number, and therefore it should not be registered any author in such cases). Retiro Library has bought all numbers during 2018.
- Add data regarding two members (you can write your own names) and the required information for representing that each member has borrowed a copy of each of the books above in different libraries, as follows:
 - The first member borrowed one book on september 25, 2018, and the other one on october 10, 2018, both for 10 days.

- The second member borrowed one book on october 21, 2018 for 5 days, and the other book on october 24, 2018 for 30 days.
- One of the members wants to borrow a copy of the first number of 2018 of the Novática journal. What happens in the DB if we try to enter this information? Why?
- Remember that you must execute the sentence `COMMIT`; when you finish inserting or updating data to save the data permanently.

Exercise 4. Data modification. Make the following changes to the data stored in the DB:

- Use an SQL sentence to modify the name of one of the library network members. Display member data with the sentence `SELECT * FROM Member` before and after the change to verify that it has been correctly modified.
- Use a **single SQL sentence** to modify the information regarding **all borrowings** from Moratalaz Public Library to extend the number of days to twice as they are now.
- “McGraw-Hill” publisher has changed its name to “McGraw-Hill Interamericana”. What are the sentences required to modify the DB data to make this change? Do you think a better way to design the DB to make changes like this one easier?
- Remember that you must execute the sentence `COMMIT`; when you finish inserting or updating data to save the data permanently.

Exercise 5. Basic queries. Answer the following questions using `SELECT` sentences:

- Display the members of Retiro Public Library.
- Display the list of borrowings requested in october.
- Display the due date of all borrowings.
- Display the borrowings with due date before october 27, 2018.
- Display the borrowings expired before today (use function `SYSDATE` to get the current date).
- Display the data of all borrowings sorted by due date in reverse chronological order.