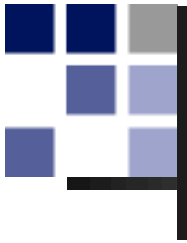Digital Technology
B. Pernici

SQL EXERCISES

Material for this class

Book

- Chapter 2

Slides

- 3-DT-BP-data-relational-exercises.pdf

Colaboratories

N1 Initial sample notebook

https://colab.research.google.com/drive/1IyI3_KCd7VlHbe9VOtCdsCOkkE8LqECy?usp=sharing

N2 SQL (empty, the solution will be published)

https://colab.research.google.com/drive/1DwZWNFPr5ktsyN9rs1R9ZRl0RULRjHyd?usp=sharing

Useful links

- SQL online tutorial
- https://www.w3schools.com/sql/

- SQLlite
- https://www.sqlite.org/index.html

- Notebooks on colab
- https://colab.research.google.com/notebooks/basic_features_overview.ipynb

What is a colab

- https://colab.research.google.com/notebooks/basic_features_overview.ipynb

- To edit and execute code in the cloud (with Google account)

- You can create your own Python notebook or
- access notebooks created by the instructors - in this case after opening the colab do
  - File -> Save a Copy in Drive

- Data are not persistent here, you have to upload (and download them to save them)

- After one hour of inactivity, the session will be ended
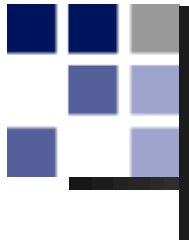
What is a notebook

To develop code interactively and analyze the result

- Two types of cells
    - Text
    - Code

- Writing the code does not execute it, you have to «run» it
(in colab, you go to the cell, click on ▶ on left)

Initial sample notebook N1

https://colab.research.google.com/drive/1IyI3_KCd7VlHbe9VOtCdsCOkkE8LqECy?usp=sharing

If in Italian select

Guida -> Visualizza in inglese

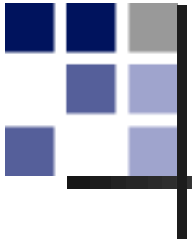Create a new empty notebook

File -> New notebook in Drive

Try SQL on CoLab

■ student version

■ https://colab.research.google.com/drive/1DwZWNFPr5ktsyN9rs1R9ZRl0RULRjHyd?usp=sharing

■ Create your own copy

■ Start the DBMS writing in a code cell
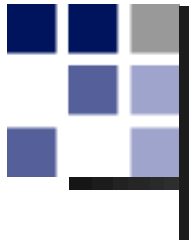
```
%load_ext sql
%sql sqlite:///mydb.sqlite
```

You are ready to write SQL statements

`You have to use the magic %%sql at the beginning of each code cell`

- **Create a table and insert values**
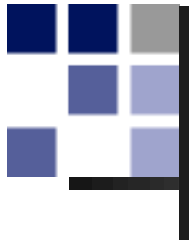 - Remember to separate each SQL statement with a ;

Example with Google CoLab

StudentID	LastName
21	Wang
13	Batini
32	Xu

CourseID	Name
3	Algorithms
7	Databases

StudentID	CourseID	Grade
13	3	26
13	7	30
32	7	28

# Exercises with a Notebook in Google CoLab

See the colab – here is a summary of the tasks that will be performed

- Connect to DB
- STUDENT DB
- INSERT 2 students
- STUDENT, EXAM, COURSE
- INSERT 2 courses
- INSERT courses attended by students
- SQL all course names with exams by students
- HOW TO IMPORT A SINGLE TABLE
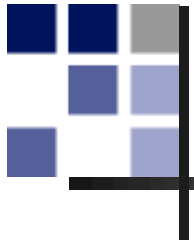
Create and insert

- Create the table STUDENT with SQL

- Insert student Wang with id 21

- Check you did it – how? Again with a query

- Insert the two other students in it

- Find the name of the course with CourseID 3
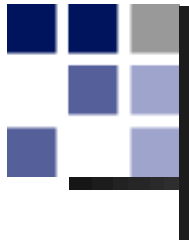
Uploading data

- Add a csv file to your notebook files, downloading it first from here (separator is ;)

https://www.dropbox.com/s/zp9v160frc6c4lw/COURSE.csv?dl=0

Try it on colab

- Add EXAM Table

- Add the tuples for exams as in the example

- Find all the grades of one of the students

Structure of tables

- ## PRAGMA

The table_info pragma is used to query information about a specific table.
The result set will contain one row for each column in the table.

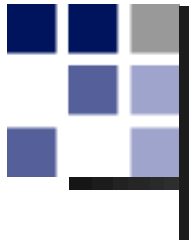| Column name	Column type	Meaning
cid	Integer	Column index
name	Text	Column name
type	Text	Column type, as given
notnull	Integer	Has a NOT NULL constraint
dflt_value	Text	DEFAULT value
pk	Integer	Is part of the PRIMARY KEY
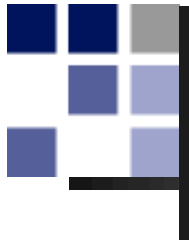
Challenges

- Create 3 Tables Customer, Product, Sale
- Each has a key, attributes for describing them (e.g. Name, age for customers, brand for Products)
- Sales contains tuples indicating sales of products to customers, with Quantity and Date
- Insert 2 customers and 3 products
- Insert a tuple into Sale
- Display the age of Customers and Date for each sale
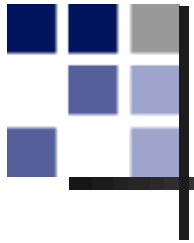
To prepare for the quiz

- The quiz will be next Wed at 13.30 (sharp) – 10 minutes

- Topics: chapters 1 and 2 of the book

- Some simple SQL queries will be part of the questions

- The link to the form is published on WeBeep in the announcements section

More exercises

- https://www.w3schools.com/sql
- https://www.sqlite.org/index.html