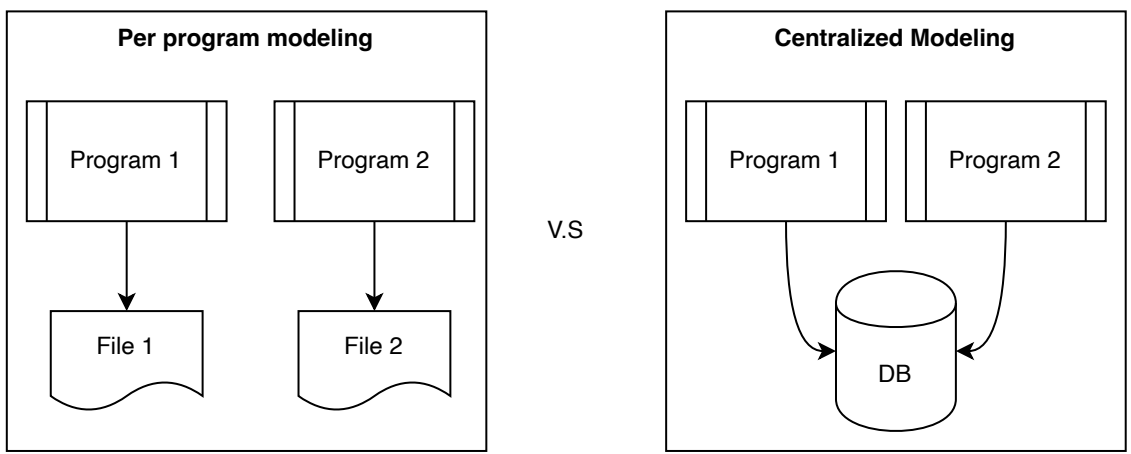
The big picture

Databases : Why?

- Difference between databases and files
- Performance, security and reusability concerns



Databases : Goals

- Store and query data
- Transparent implementation for user
- Used accross several applications

Databases : 3 different languages

- Model data : Data Definition Language (Data Structure)
- Modifiy data : Data Manipulation Language (Data modification)
- Control data : Data Control Language

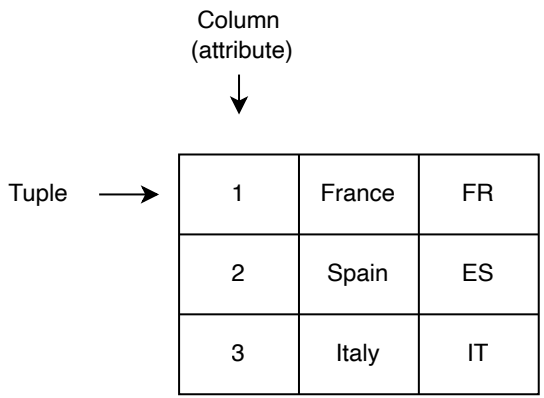
Databases : 3 different languages

- DDL represents the data (Entities and Relationships)
- DML gives a simple way to modify data
- DCL ensures that data are correctly modified and that integrity is preserved

Table Structure

- The table represents an entity (equivalent of a UML Class), it is also called relation.
- A relation (table) is constituted of attributes (columns), and rows of this table are called tuples.
- Each rows represents one instance of the entity represented by this table

Table Structure (2)



Column types (most common ones)

Type Name	Description
CHAR(n)	Fixed length characters string
VARCHAR(n)	Variable length characters string
TEXT	Infinite length characters string
INT	Integer numeric value
FLOAT(n)	Floating point numeric value
DATE	Stores the date only
TIME	Stores the time only

Column types (Continued, specific to PostgreSQL)

Type Name	Description
TIMESTAMPTZ	Stores the time stamp (date and time) with time zone
ARRAY[n]	Stores an array of dimension n, the array can store any type
JSON	Stores a JSON document with ability to query

First contact with DDL, with PostgreSQL

- Why PostgreSQL?
- **Demo** Setting up PostgreSQL with CentOS and docker

Linking with other tables

- It exists some possibility to declare links to other tables
- It is part of the Control function of Databases
- Primary keys to define uniqueness for tuples
- Foreign keys to define external data linked to the current tuple

Linking with other tables (2)