Group Project Seminar on Programing and Analysis

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GPS on Programing and Analysis

- Introduction to programing

- Introduction to Relational Database

- Best practices and Fundamental concepts for data organization and manipulation

Objectives and Goals

Students should be able to:

- Write medium size scripts in Python

- Understand the base concepts of relational databases

- Query and manipulate geospatial data in a relational database

Objectives and Goals

Students should be able to:

- Create pipelines for Extract, Transform and Load (ETL)

- Understand the usage of an API

- Create an API

Program (week 1)

- 01 | Introduction and installs
- 02 | Introduction to Python I
- 03 | Introduction to Python II
- 04 | Introduction to Pandas
- 05 | Introduction to relational databases

Program (week 2)

- 06 | Introduction to SQL
- 07 | Introduction to PostGIS
- **08 | Working example *** (30 Jan)
- 09 | Working example
- **10 | Working example ** (03 Fev)**

- *** Limit date to inform by email group main idea and source data**
- **** Group project presentation to the rest of the class (members, main idea and source data)**

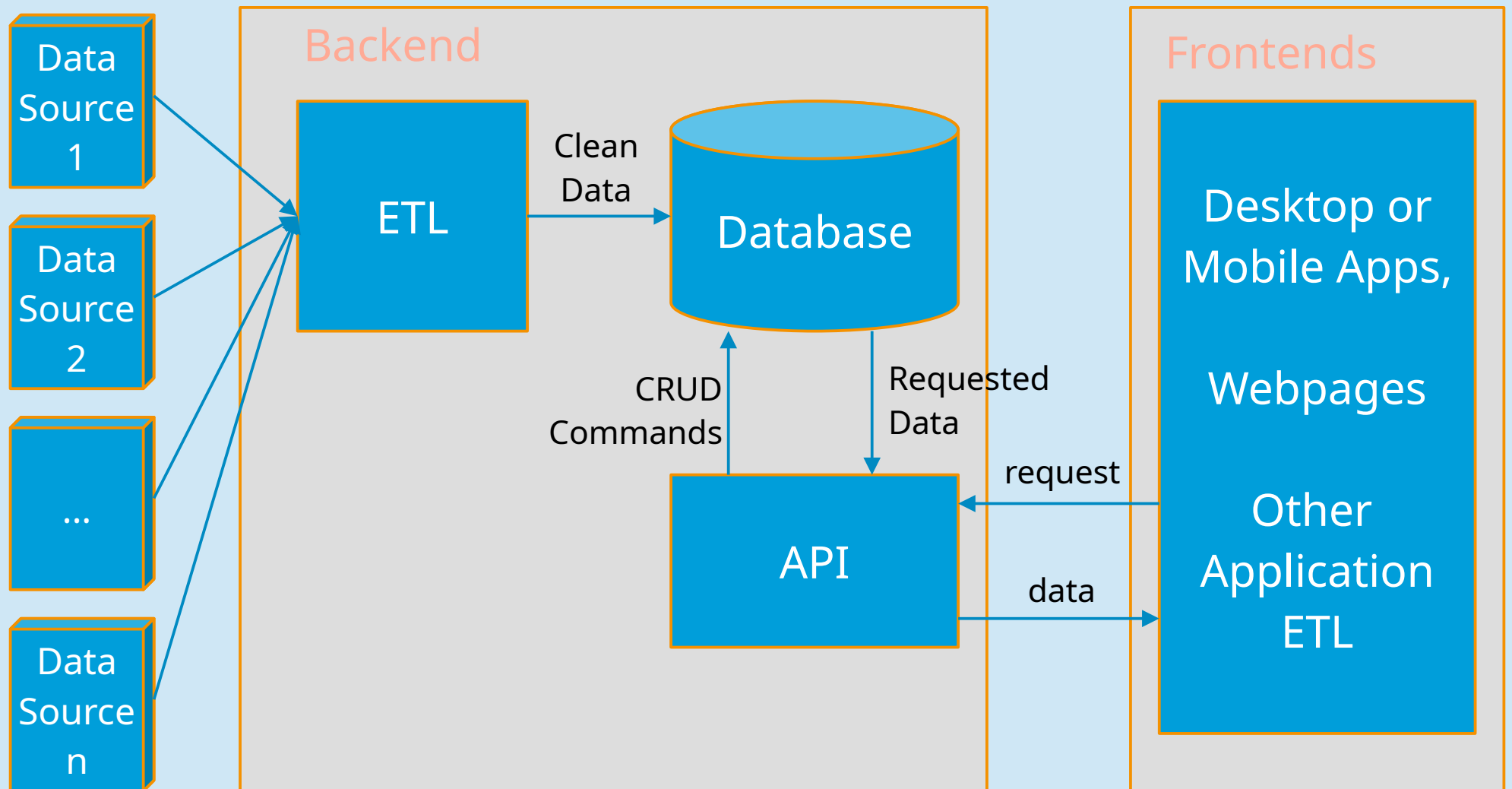# Program (following weeks)

- Group Project assignment (up to February 21)

- Final Group Project presentation (February 26th)

Project Assessment

- Project theme is open

- Group of 2 to 3 people

- Must include:

  - An ETL module (Python);

  - A CRUD module (Database);

  - An API module (Python);

ETL + CRUD + API

Project Assessment

- Must use:
    - Python 3 and any necessary packages
    - PostgreSQL\PostGIS

- No proprietary software or packages are allowed

- All the code produced should be constantly public in a Github repository

Project presentations

- 18 | 25/02/2026 | Project presentation

Each group makes a quick 10-15 min. presentation of their project to the class. Followed by Questions and Answers from the rest of the class.

GPS Evaluation

- Project's grade 80% (16 pts)

- Presentation's grade 10% (2 pts)

- Individual performance during classes 10% (2 pts)

Project Grade Valuation (16pt)

- It works as expected and follow the initial objectives
- Package dependencies are stated and available in a yaml file;
- Code is organized in modules and packages;
- Functions and methods have descriptive docstrings;
- Code is correctly formated and stylistically consistent;
- Code have comments explaining its logic, when clarification is needed;
- Modules have a README.md file explaining the purpose and use of the module.

GPS Evaluation

- Project's grade (16 pts)

  - An ETL module (30%);

  - A CRUD module (30%);

  - An API module (30 %);

  - The last 10% are for groups that go beyond the class materials. For example, by creating a frontend webpage using HTML, javascript, leaflet.

Project Examples

- Crop Health Monitoring

  https://github.com/Abranidrees/Crop-Health-Monitoring

- Pasteis D.C. Lda: Optimised Pastel de Nata Distribution Company

  https://github.com/andre-kotze/pasteis-dc

- Regional-Thoughts

  https://github.com/mareyam0/Regional-Thoughts

- OSM-Interrail-Planner

  https://github.com/OSM-Interrail-Planner/osm_interrail_planner

  Mapping Ocean Hazards in Hawaii

- https://github.com/juliakrtz/proj_seminar_ocean_haz

GPS on Programing and Analysis

- Questions?