Sistemas de Informação e Bases de Dados 2020/2021
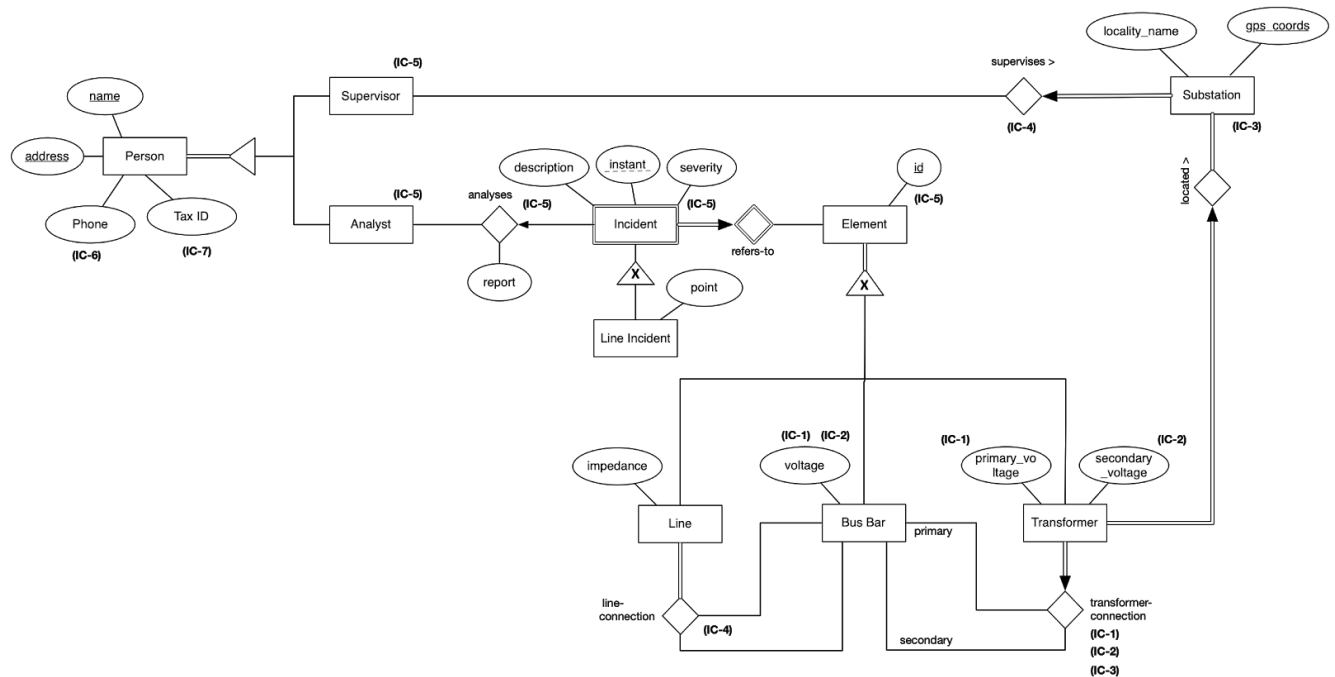
Project Assignment - Part 2

The second part of the project aims at creating, populating, and querying a database that implements the Entity-Association model presented.

Entity-Association Diagram

Consider the Entity-Association diagram that will be used in the next sections[1]:

Along with the following Integrity Constraints:

- **(IC-1)** The **voltage** of the **primary** Bus Bar must match the **primary voltage** of the Transformer to which the Bus Bar is **connected**
- **(IC-2)** The **voltage** of the **secondary** Bus Bar must match the **secondary voltage** of the Transformer to which the Bus Bar is **connected**
- **(IC-3)** The Busbars of a **transformer connection** must be different
- **(IC-4)** The Busbars of a **line connection** must be different

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[1] N.B.: The diagram presented is a simplification of the domain presented in the first part of the project (Part 1) and is not the solution, nor part of the solution.

- **(IC-5)** Persons cannot **analyse** incidents regarding Elements of a Substation they **supervises**
- **(IC-6**) Phone numbers are unique
- **(IC-7)** Tax ID numbers are unique

Work to be developed

Translation to SQL

1. Using the SQL (DDL) language, present the statements to create the database **corresponding to the Entity-Association model developed above**. Ensure that data types and field sizes selected are the most appropriate. The constraints on each field, row and table must also be specified. Ensure that **not null**, **check**, **primary key**, **unique**, **foreign key** constraints are appropriately used. The use of accented characters and cedillas should be avoided.
2. List all the constraints that exist in the Entity-Association model that cannot be captured (implemented) in the SQL schema, writing them **as comments** to the respective tables.

Database Loading

Define in SQL (DML) all the **INSERT statements** that you find necessary to cover specific characteristics that real data scenarios can have in order to validate the expected results of the queries.

SQL Queries

A. List the names of all analysts that analysed element with id 'B-789'
B. What is the name of the analyst that has reported more incidents
C. List all substations with more than one transformer
D. Find the names of the localities that have more substations than every other locality

Evaluation

The project will be evaluated from the submission that should contain all the answers to the items requested above. Oral discussions may be requested to randomly selected groups. The following table indicates the valuation of each part of the work to be developed.

Item	Grading (0-20)
Translation to SQL	4.0
Integrity Constraints	2.0
Database Loading	6.0

SQL Queries	8.0

The quality (in terms of organisation, indentation, and simplicity) of the SQL scripts will also be evaluated.

Submission

The submission must be a structured **zip** file named `project-db-GG.zip`[2] where GG is the number of the group as follows[3]:

`cover.pdf`	**A PDF with the name of the model and the corresponding constraints** The report should start with a cover page with the title "**SIBD Project - Part 2**", with the **name and number of students**, the **relative percent of each student's contribution**, together with the **total effort (in hours) that each element of the group dedicated to the project**, the **number of the group**, the **shift to which the group belongs**, and **the name of the laboratory teacher.** The report can have at most one page where groups can write down notes concerning aspects they consider relevant.
`schema.sql`	**File with the schema creation instructions** This file should cleanly drop any existing tables before recreating them. The constraints that exist in the Entity-Association model that are not captured (implementable) in the SQL schema should be added as comments to the corresponding tables.
`queries.sql`	**File with the SQL Queries** Please ensure that queries are clearly marked using comments.
`populate.sql`	**File with the scripts that populate the database** N.B.: The script should be runnable in POSTGRES on `db.tecnico.ulisboa.pt`
`output.txt`	**File with the output of each query** Please make sure that the output of each query is clearly marked.

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[2] ⚠ Only ZIP or GZ formats are accepted. Other archive formats (such as RAR) are not accepted.
[3] Penalties will apply to the submissions that do not meet the structure requested.