Energy Informatics

https://proglang.informatik.uni-freiburg.de/teaching/energy-informatics/2018ws/

Exercise Sheet 7 − SQL

2018-12-04

In these SQL exercises, you will work on a Postgresql database installed in one of the university's servers. In order to access this database we will use *postgresql*. It will enable you to connect to the postgresql server, post SQL queries to the server and get the results back.

The server is at the address `pldb.informatik.privat` and the database is `postgres`. You have access to a read-only user `student` with the password `student`. To connect to the database:

```
psql -h pldb.informatik.privat -d postgres -U student
```

The database contains automatically generated data about households power consumption in different german cities. The following commands give you an overview of the database.

- To get all database tables:

  ```
  \dt+
  ```

- To describe a table:

  ```
  \d city;
  \d building;
  \d houshold;
  \d reading;
  ```

For each of the following exercises, write *a single* sql query and the corresponding results. Make sure to deliver only the requested information!

Exercise 1
Using *power_consumption* database, write SQL queries that find:

- All fuel types appear in the database.

- All readings information (fuel type, reading date, reading value) of cities with population less than 50000.

Exercise 2 (Join variants)
Using one of the join variants, find unique city names where at least one of the city households doesn't have a reading. Don't use subquery.

Exercise 3 (Subqueries)
Use at least one subquery among other SQL techniques to find unique city names where at least one of the city households doesn't have a reading.

Exercise 4 (Set Operators)
Find the complementary city set to the set of cities you found in the previous query. Give a different textual description of this set of cities.

Exercise 5 (Aggregation and Grouping)
Employ aggregation functions and grouping among other SQL techniques to answer the following requests:

- For each city (city name), what is the average household's space

- For each city (city name), what is the average number of households per building

- Find the city (city name) with the maximum average of gas consumption