

DBMS::E-R Diagram

```
graph TD
    operator -- "(1,1)" -- employs -- "(1,n)" --> center
    operator -- "(0,n)" -- records -- "(1,1)" --> parameter
    center -- "(0,n)" -- contains -- "(1,1)" --> parameter
    center -- "(1,n)" -- monitors -- "(0,n)" --> area
    area -- "(0,n)" -- located -- "(1,1)" --> center
    parameter -- "(1,1)" -- composed_by -- "(0,n)" --> category
    parameter -- "(1,1)" -- recorded_from -- "(0,n)" --> area
```

The diagram illustrates the following entities and their attributes:

- operator**: PK user_id, ssid, surname, name, email, password. Attributes: VARCHAR(20), CHAR(16), VARCHAR(100), VARCHAR(100), VARCHAR(20), VARCHAR(20).
- center**: PK center_id, name, street, house_number, postal_code, district. Attributes: INT, VARCHAR(100), VARCHAR(100), SMALLINT, INT, VARCHAR(100).
- area**: PK geoname_id, name, ascii_name, country_code, country_name, latitude, longitude. Attributes: INT, VARCHAR(100), VARCHAR(100), CHAR(2), VARCHAR(100), DECIMAL, DECIMAL.
- parameter**: PK rec_date, rec_time, geoname_id, center_id, user_id, category_id, score, notes. Attributes: DATE, TIME, INT, INT, VARCHAR(20), VARCHAR(20), INT(5), VARCHAR(256).
- category**: PK category_id, explanation. Attributes: VARCHAR(20), VARCHAR(256).

Relationships and Cardinalities:

- employs**: operator (1,1) to center (1,n).
- records**: operator (0,n) to parameter (1,1).
- contains**: center (0,n) to parameter (1,1).
- monitors**: center (1,n) to area (0,n).
- located**: area (0,n) to center (1,1).
- composed by**: parameter (1,1) to category (0,n).
- recorded from**: parameter (1,1) to area (0,n).

