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Course intro. First steps in SQL. – ECBS 5146 SQL and Different Shapes of Data

6–7 minutes

Overview

Teaching: 90 min

Questions

- What is data engineering and why it is important for data analysts?
- How to access a data set, stored in a database?
- How to load various data files (eg. csv) into database?

Objectives

- Setting the context - evolution of digital persistency 1950-2010
- Introducing the basic terms, in context of SQL
- Writing the first SQL
- Setting local MYSQL / Workbench (Expected to be done prior to the course)
- Understanding how to work in MySQL Workbench
- Creating and exploring the first MySQL database

- Understanding how to backup and restore a database

Keywords

#INTRO

#LOCAL ENVIRONMENT

#BASIC SQL

#YOUR FIRST DATABASE

#DUMPS

Table of Content

Prerequisites for this chapter

- Install: MySQL Community Server, MySQL Workbench

SQL in 6 minutes

Browse to https://www.w3schools.com/sql/trysql.asp?filename=trysql_op_in

Query 1

Query 2

```
SELECT supplierName, COUNT(*) AS 'number of products'
FROM suppliers
INNER JOIN products
        ON products.SupplierID = suppliers.SupplierID
GROUP BY suppliers.SupplierID;
```

Query 3

```
SELECT  o.OrderDate,
        o.OrderID,
        o.ShipperID,
        ROUND(SUM(od.Quantity * p.Price), 0) AS
Basket,
        CASE WHEN od.Quantity < 30 THEN 'SMALLQ' ELSE
'HIGHQ' END as QuantityLabel
FROM Orders AS o
     LEFT JOIN OrderDetails AS od ON od.OrderID =
o.OrderID
     INNER JOIN ( SELECT * FROM Products WHERE Price
>= 100 ) AS p on p.ProductID = od.ProductID
GROUP BY o.OrderID,
         o.ShipperID
HAVING Basket >= 1000
ORDER BY o.OrderDate DESC, o.OrderID;
```

First look on MySQL and MySQL Workbench

Screenshot help

Your first local MySQL Database

Create your first database / schema

SQL is not case sensitive:

For the next commands, make sure the created db is selected

Deleting a database

Execute twice

`Note` second time you will get and error because the db is already deleted with the first one.

Try this instead

```
DROP SCHEMA IF EXISTS firstdb;
```

Let's create a db again

```
CREATE SCHEMA birdstrikes;
USE birdstrikes;
```

Loading CSV into a table

Note: If you are not familiar with CSV file format, read the CSV section here

Let's create a table:

```
CREATE TABLE birdstrikes
(id INTEGER NOT NULL,
aircraft VARCHAR(32),
```

```
flight_date DATE NOT NULL,
damage VARCHAR(16) NOT NULL,
airline VARCHAR(255) NOT NULL,
state VARCHAR(255),
phase_of_flight VARCHAR(32),
reported_date DATE,
bird_size VARCHAR(16),
cost INTEGER NOT NULL,
speed INTEGER,PRIMARY KEY(id));
```

This table is empty, we need to fill in with data.

This time we will load a csv file into the table. For security reason, CSV loading is limited, so you need to copy the CSV file in a place indicated by this command:

```
SHOW VARIABLES LIKE "secure_file_priv";
```

also the next command should give you “ON”

```
SHOW VARIABLES LIKE "local_infile";
```

Plan A

If “local_infile” is “ON” and “secure_file_priv” is not “NULL”

Copy birdstrikes_small.csv in the folder resulted in the previous command.

Then load CSV data into the table with this command:

```
LOAD DATA INFILE 'c:/ProgramData/MySQL/MySQL Server
8.0/Uploads/birdstrikes_small.csv'
INTO TABLE birdstrikes
FIELDS TERMINATED BY ';'
```

```
LINES TERMINATED BY '\r\n'
IGNORE 1 LINES
(id, aircraft, flight_date, damage, airline, state,
phase_of_flight, @v_reported_date, bird_size, cost,
@v_speed)
SET
reported_date = nullif(@v_reported_date, ''),
speed = nullif(@v_speed, '');
```

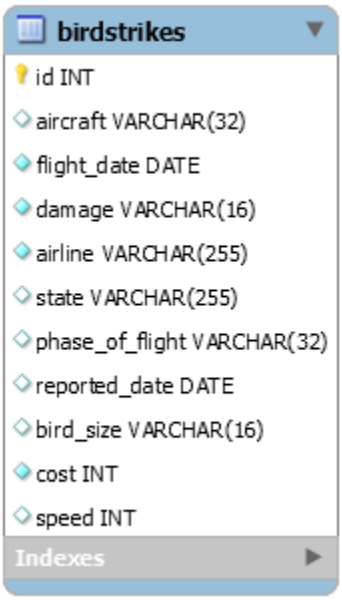
Plan B

If “local_infile” is not “ON” or “secure_file_priv” is NULL, you need to change my.cnf (Mac,Linux) or my.ini (Windows). This is an advanced operation, so as plan B: download birdstrikes.sql and Open SQL Script in MySQL Workbench, then execute.

Exploring your first database

List the table(s) of your database

List the structure of a table



Retrieving data stored in birdstrikes

```
SELECT * FROM birdstrikes;
```

Select certain field(s)

```
SELECT cost FROM birdstrikes;
```

```
SELECT airline,cost FROM birdstrikes;
```

Dumping a database with MySQL Workbench

Screenshot help

Ninja challenge

- Load lines starting with “Data:” from ninja.txt into a table.
- Further requirements:
- Divide the last column with 1000 during the load
- ” signs should be removed during the load
- Dump the table and send to me in mail with the sql script.

Homework 1

- Import a relational data set of your choosing into your local instance.
- Requirements:
- find a data set worth to analyze later (prepares you for the term project)
- no restriction on the type of data source, can be excel, csv, another db, sql file etc
- pay attention on the relational nature of the set, advised to find a

structure of 3+ interlinked table

- do not use this: https://www.mysqltutorial.org/mysql-sample-database.aspx (because we will use it later in the course)
- hint: you can find various open datasets on the internet, like here: https://data.worldbank.org/
- Create a public GitHub repo. This repo will be used for all homeworks and term project in this course.
- Save your artifacts (possible sources like csv, sql file) in a folder called HW1.
- Submit GitHub repo link to moodle when you are ready