LU07a - SQL-DDL: DB Management

Learning Objectives

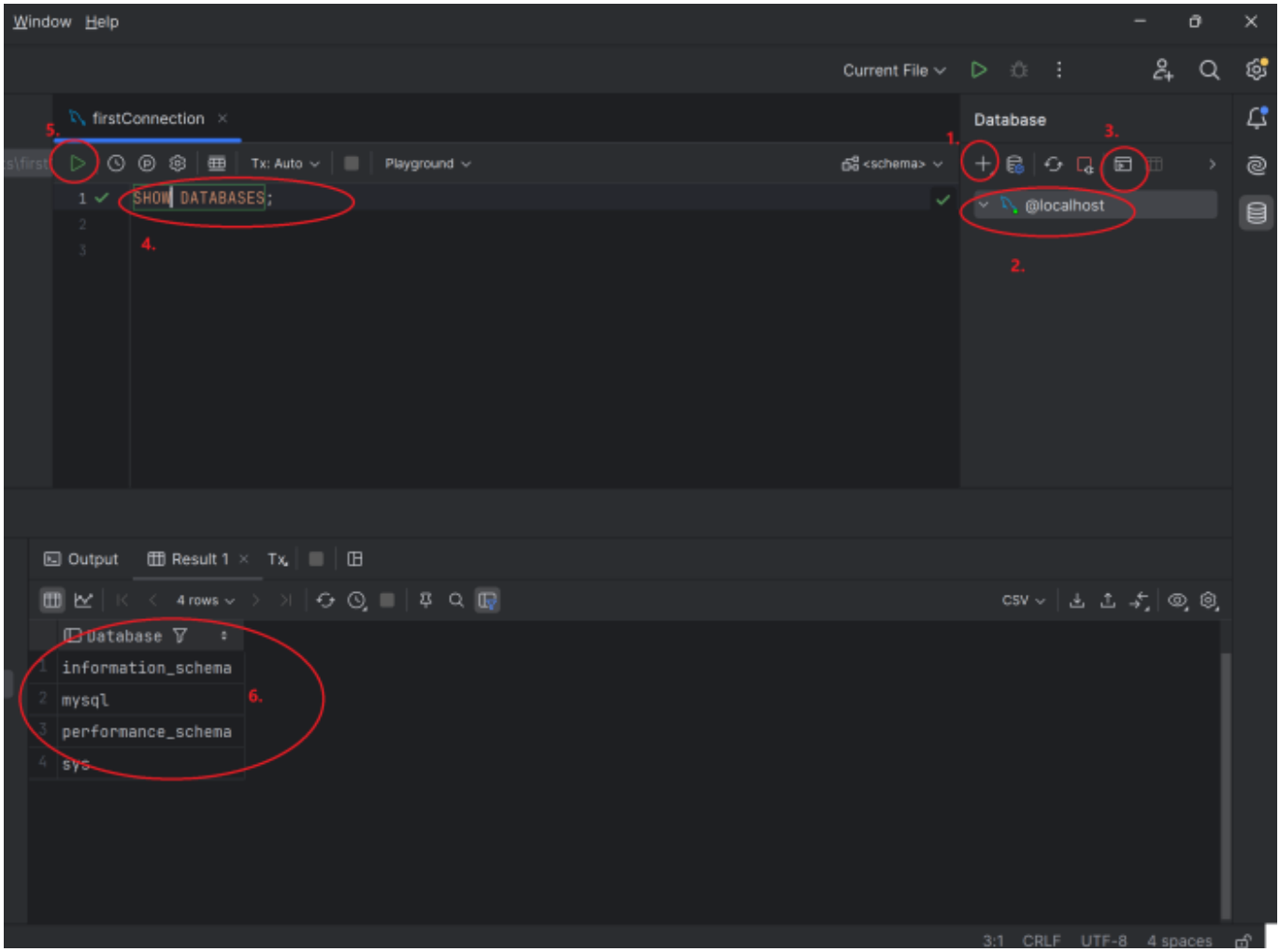
In this session, we will learn some thrilling details about how to properly manage our databases. To achieve this, we need to know more about:

1. What a db schema / db instance is.
2. How to create database instances.
3. How to display all currently available instances.
4. How to connect to one specific db-instance.
5. how you can delete obsolete or no longer required databases.

Access to the db with Webstorm code editor

There are many ways how we can connect to our database instance. One way is from the terminal or commandline. Instead, during the module 290 we are going to use do the management with the code editor WEBSTORM, which is pictured below.

1. New connection to our MySQL database system
2. The already existing connections to our database instance
3. New terminal window to the database to enter sql commands (leads to 4.)
4. Terminal to the database to enter our SQL commands
5. Execute button that sends the SQL command to the database



DB Schema vs. DB Instance

A database schema and a database instance are related concepts in the context of a database system, but they refer to different aspects:

1. Database Schema: The schema is the structure or blueprint that defines how data is organized within the database. It describes the database's logical design, including:

- **Tables**: The individual entities (e.g., Customers, Orders).
- **Columns**: The attributes of each entity (e.g., CustomerID, OrderDate).
- **Constraints**: Rules applied to the data (e.g., primary keys, foreign keys, unique constraints).
- **Relationships**: How tables relate to one another (e.g., one-to-many, many-to-many relationships).
- **Views, indexes, triggers, and stored procedures**: Other elements that define how the data is accessed or managed.

Think of the schema as the blueprint or structure of the database that remains mostly static or changes rarely.

2. Database Instance: The instance refers to the actual data stored in the database at a particular point in time. It is the current state of the database, including all of the records or entries inside the tables defined by the schema.

It includes actual rows of data in the tables. The instance can change frequently as data is inserted, updated, or deleted. You can think of the instance as the current snapshot of the database contents, while the schema defines the permanent framework.

Analogy: The schema is like the blueprint of a building (defining rooms, walls, and layout), while the instance is like the current state of the building (furniture, people inside, and their positions, which can change).

Commands

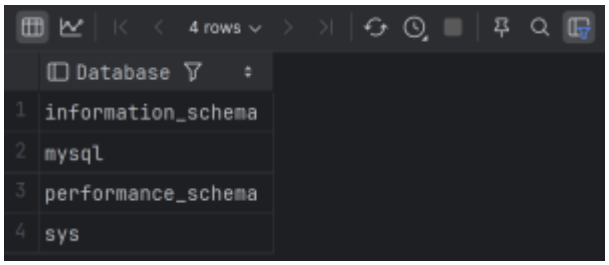
SHOW DATABASES

Source: Alle verfügbaren Datenbanken anzeigen lassen

To show all currently available datases we use the SHOW command. The basic syntax is as shown belon:

```
SHOW DATABASES;
```

After executing this command, we will receive the list of currently installed database instances, as shown in the following picture.



CREATE DATABASES

Source: CREATE DB

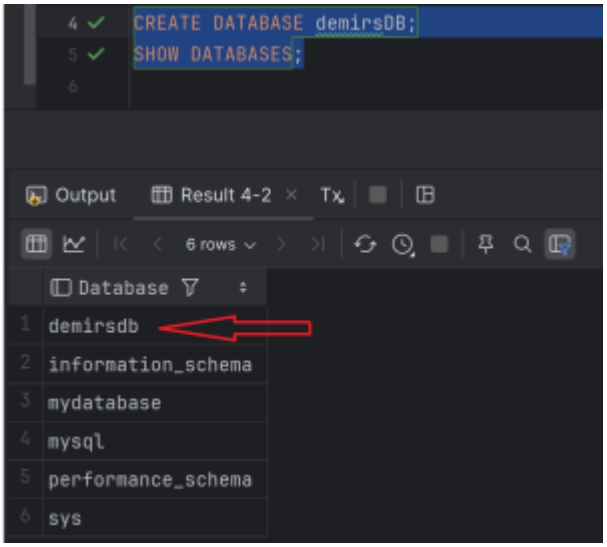
A new application is basicly constructed within a new enviroment. Therefore we need to create a new database instance for us. To achive this, which is done by the following command syntax.

```
CREATE DATABASE myDatabase;
```

So, if we want to create a new database for a webshop for our customer „Demir“, we need to type in:

```
CREATE DATABASE DemirsDB;
SHOW DATABASES;
```

After executing both commands, our result-set would look like:



DROP DATABASES

Source: DROP DB

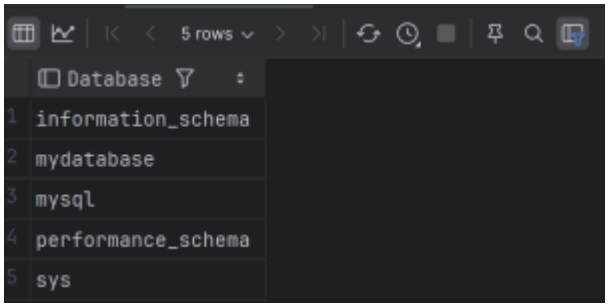
It can happen, that our database is corrupted, obsolete or elsewise not required any more. Thus, we have to delete it, which is done by the command

```
DROP DATABASE myDatabase;
```

So, if we want to delete demirsDB, we need to type in the following SQL commands.

```
DROP DATABASE demirsDB;
SHOW DATABASES;
```

After, executing both commands, the result-set would look like:



Using databases

Most database systems usually have more than one instance (project areas) running, e.g. DIGITECH.CH and GALAXUS.CH, these two database instances (storage areas for different purposes) are running on the same database systems, but organize their data separately.

As a database administrator, we cannot work on different instances at the same time, so we have to choose which instance we actually want to work on. The SQL statement in question is the USE command.

As a database administrator, we cannot work on different instances at the same time, so we have to choose which instance we actually want to work on. The SQL statement in question is the USE command.

```
10  CREATE DATABASE demirsDB1;
11  CREATE DATABASE demirsDB2;
12  CREATE DATABASE demirsDB3;
13  SHOW DATABASES;
14  USE demirsDB3;
```

Vocabulary

English	Deutsch
Obsolete	veraltet
result-set	Ergebnismenge
