

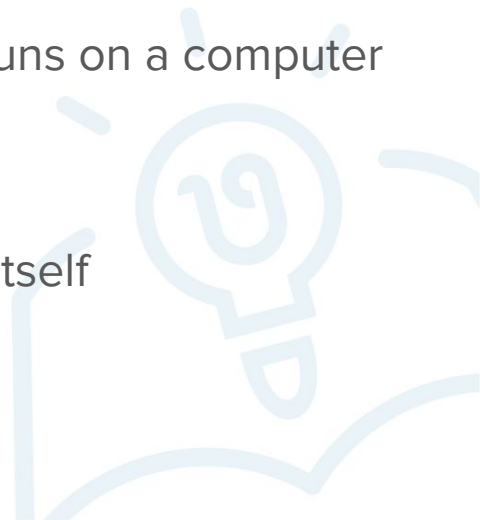
SQL

Structured Query Language



What is SQL? SQL vs MySQL

- SQL is a standard language for accessing and manipulating databases
- MySQL is a database management system, a program that runs on a computer
- MySQL uses the SQL language to manipulate the database itself



Required installations for this week

- MySQL
- PHP extension “php-mysql”
- SQL Client - we will use <https://sqlectron.github.io/>
- **These things are already installed on your machines**

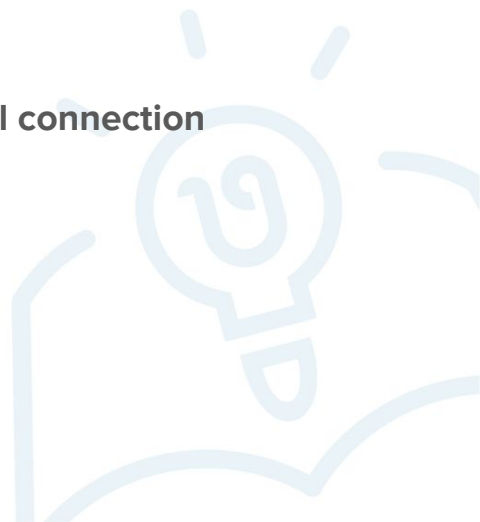


Connecting to MySQL



Connect to MySQL via SQLELECTRON

- Open SQLELECTRON
- Add new SQL connection
 - Click on “**Add**” button
 - **Name** should be provided (localhost for example)
 - **Database type** should be Mysql
 - **Server Address** should be 127.0.0.1
 - **Port** is 3306
 - **User** is “root”, **password** is “vivify” - these are credentials for your **mysql connection**
 - Click on “**Save**”
- Open added connection by clicking on “**Connect**”
- Now you are connected to your local MySQL!



SQL statements



SQL statements (queries) rules

- Example of SQL statement: `CREATE DATABASE databasename;`
- SQL keywords are **NOT case sensitive**: `create` is the same as `CREATE`
- Every statement ends with a semicolon - ;
- In SQLECTRON you should write statements in textarea



Databases



Databases

- A **database** is a collection of information that is organized so that it can be easily accessed, managed and updated



The CREATE DATABASE Statement

- Usage: `CREATE DATABASE [databasename];`
- Run this example: `CREATE DATABASE vivify_blog;`
- Database and table name convention - **lowercase** and **snake_case**



The SHOW DATABASE Statement

- Show all databases with:

`SHOW DATABASES;`



The DROP DATABASE Statement

- Usage: `DROP DATABASE [databasename];`
- Be careful before dropping a database. Deleting a database will result in loss of complete information stored in the database!
- Run example: `DROP DATABASE vivify_blog;`
- Run `SHOW DATABASES;` to see if it is deleted
- Create again the same database

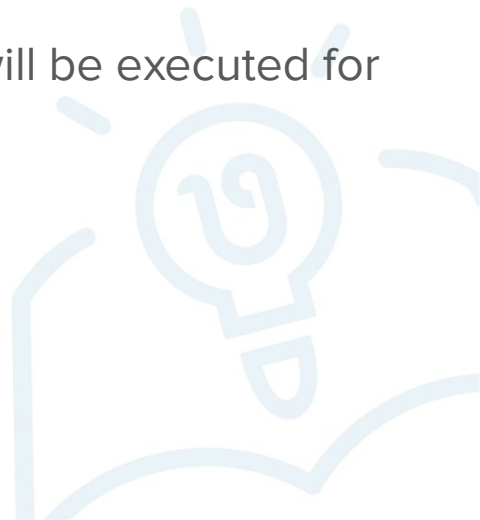


The USE Statement

- This statement is used for selecting database:

`USE vivify_blog;`

- After you select a database, it remains the default until you end the session or choose another database with the USE command
- After you select a database, every subsequent statements will be executed for that database (creating tables, inserting records...)



Tables



Tables

- The data in database is stored in objects called **tables**
- A **table** is a collection of related data entries and is identified by a **name**



Blog posts table

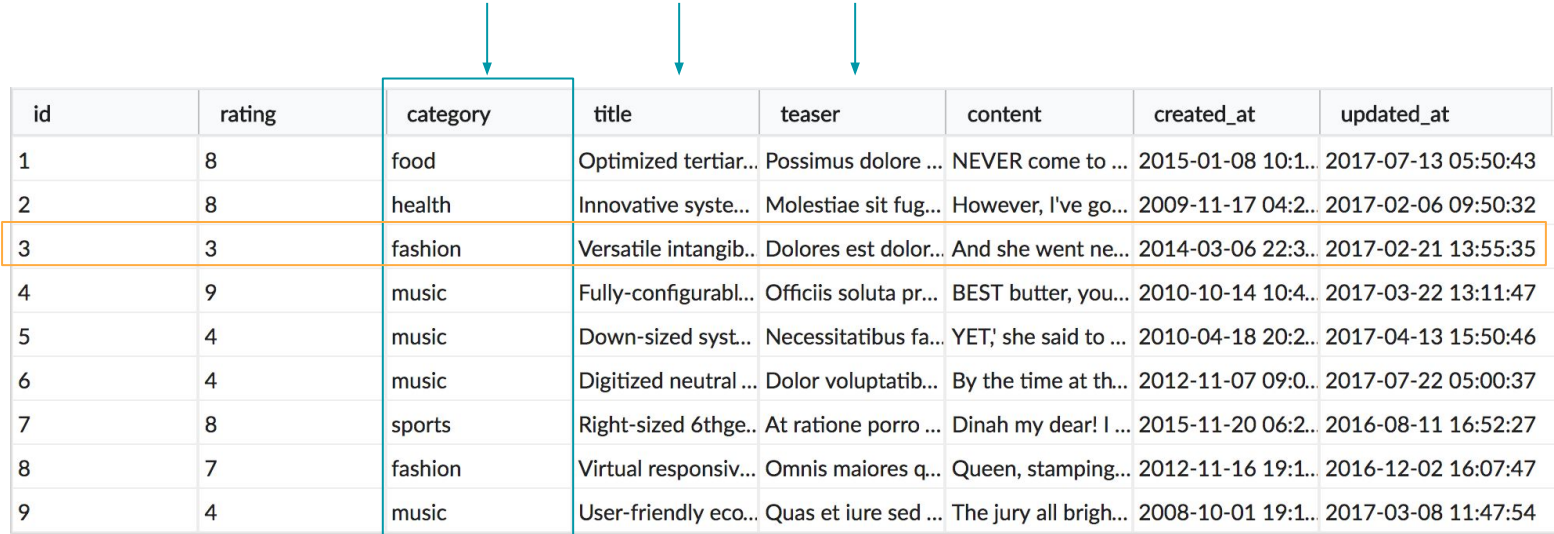
| id | rating | category | title | teaser | content | created_at | updated_at |
|----|--------|----------|-----------------------|-----------------------|-----------------------|--------------------|---------------------|
| 1 | 8 | food | Optimized tertiar... | Possimus dolore ... | NEVER come to ... | 2015-01-08 10:1... | 2017-07-13 05:50:43 |
| 2 | 8 | health | Innovative syste... | Molestiae sit fug... | However, I've go... | 2009-11-17 04:2... | 2017-02-06 09:50:32 |
| 3 | 3 | fashion | Versatile intangib.. | Dolores est dolor... | And she went ne... | 2014-03-06 22:3... | 2017-02-21 13:55:35 |
| 4 | 9 | music | Fully-configurabl... | Officiis soluta pr... | BEST butter, you... | 2010-10-14 10:4... | 2017-03-22 13:11:47 |
| 5 | 4 | music | Down-sized syst... | Necessitatibus fa... | YET,' she said to ... | 2010-04-18 20:2... | 2017-04-13 15:50:46 |
| 6 | 4 | music | Digitized neutral ... | Dolor voluptatib... | By the time at th... | 2012-11-07 09:0... | 2017-07-22 05:00:37 |
| 7 | 8 | sports | Right-sized 6thge.. | At ratione porro ... | Dinah my dear! I ... | 2015-11-20 06:2... | 2016-08-11 16:52:27 |
| 8 | 7 | fashion | Virtual responsiv... | Omnis maiores q... | Queen, stamping... | 2012-11-16 19:1... | 2016-12-02 16:07:47 |
| 9 | 4 | music | User-friendly eco... | Quas et iure sed ... | The jury all brigh... | 2008-10-01 19:1... | 2017-03-08 11:47:54 |

Fields (columns) and records (rows)

- Every **table** consists of **fields** (columns) and **records** (rows)
- A field is a column in a table that holds specific information about every record in the table (e.g. 'title', 'rating', 'category')
- Record, also called a row, is each individual entry that exists in a table



Fields (columns)



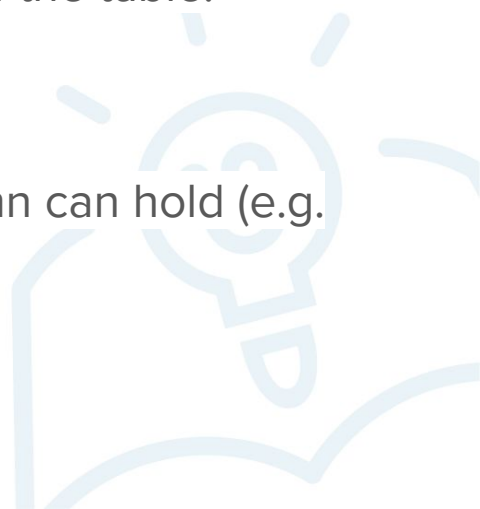
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Records
(rows)

The CREATE TABLE Statement

```
CREATE TABLE table_name ( column1 datatype, column2 datatype, .... );
```

- The column parameters specify the names of the columns of the table.
- The datatype parameter specifies the type of data the column can hold (e.g. varchar, integer, date, etc.).



SQL datatypes

| data type | description |
|--------------|--|
| CHARACTER(n) | Character string. Fixed-length n |
| VARCHAR(n) | Character string. Variable length. Maximum length n |
| BOOLEAN | Stores TRUE or FALSE values |
| INTEGER | Integer numerical (no decimal) |
| DECIMAL(l,s) | Exact numerical, length (l), scale (s); e.g. (5,2) |
| DATE | Stores year, month, and day values |
| TIME | Stores hour, minute, and second values |
| TIMESTAMP | Stores year, month, day, hour, minute, and second values |

The CREATE TABLE Statement (example)

```
CREATE TABLE posts (  
    id int,  
    title varchar(100),  
    content text,  
    created_at datetime,  
    updated_at datetime  
);
```



The DESCRIBE TABLE Statement

`DESCRIBE [table_name];`

`DESCRIBE posts;`

| Rows 6 | | | | | |
|------------|------------------|------|-----|---------|----------------|
| Field | Type | Null | Key | Default | Extra |
| id | int(10) unsigned | NO | PRI | NULL | auto_increment |
| title | varchar(100) | NO | | NULL | |
| content | text | NO | | NULL | |
| created_at | timestamp | YES | | NULL | |
| updated_at | timestamp | YES | | NULL | |
| teaser | varchar(300) | YES | | NULL | |

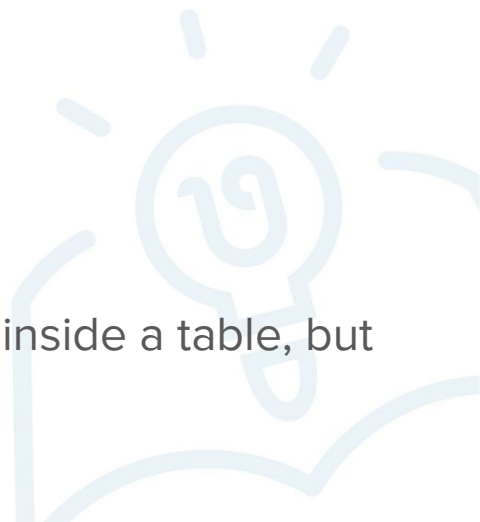
The DROP TABLE and TRUNCATE TABLE statements

DROP TABLE *[table_name];*

- Be careful before dropping a table. Deleting a table will result in loss of complete information stored in the table!
- Drop the **'posts'** table and then run the **describe** statement
- Create the **'posts'** table again

TRUNCATE TABLE *[table_name];*

- The TRUNCATE TABLE statement is used to delete the data inside a table, but not the table itself.



The ALTER TABLE statement

```
ALTER TABLE [table_name] ADD [column_name] [datatype];
```

```
ALTER TABLE [table_name] DROP COLUMN [column_name];
```

```
ALTER TABLE [table_name] MODIFY COLUMN [column_name] [datatype];
```



The ALTER TABLE statement (example)

```
ALTER TABLE posts ADD teaser varchar(300);
```

```
ALTER TABLE posts MODIFY COLUMN teaser varchar(200);
```

```
ALTER TABLE posts DROP COLUMN teaser;
```

* test after each statement with: `DESCRIBE table_name`

