BAZY DANYCH

SWIAT RELACYJNY

Encje Atrybuty encji Związki encji

SQL

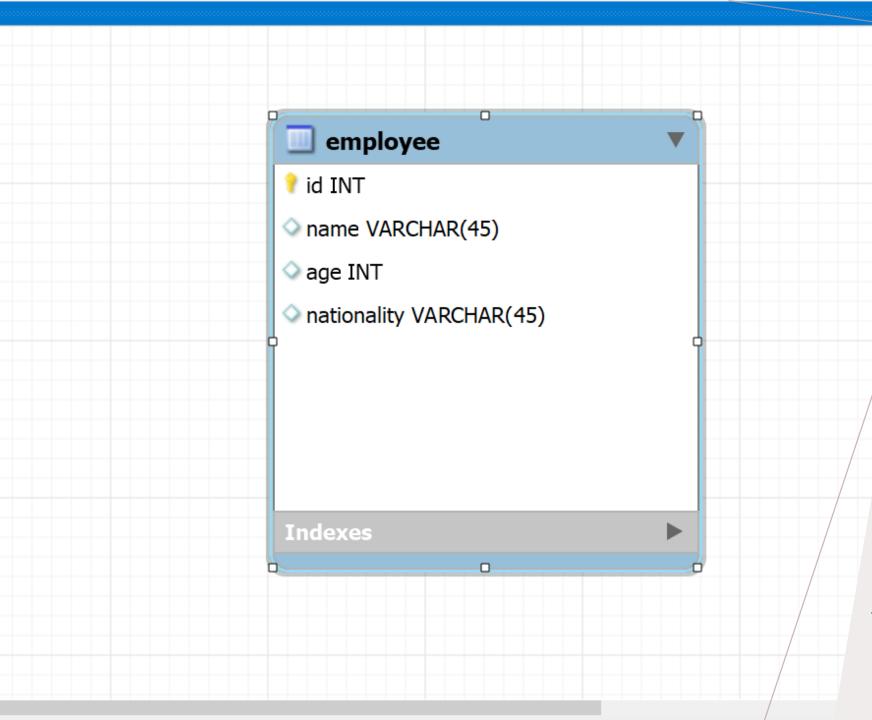
Structured Query Language (Strukturalny Język Zapytań)

Język programowania zaprojektowany do zarządzania danymi przechowywanymi w relacyjnej bazie danych. Podstawowym elementem składniowym języka są proste, deklaratywne instrukcje.



	id	name	age	nationality
	1	Jessica	22	Ireland
	2	Gabriel	48	France
•	3	Laura	36	USA
	NULL	NULL	NULL	NULL

RELACYJNE BAZY DANYCH



RELACYJNE BAZY DANYCH

TERMINOLOGIA

Kwerenda, zapytanie (query), instrukcja (statement, instruction), komenda (command) - najmniejsza, samodzielna część skryptu SQL, która może być poprawnie wykonana na bazie. Składa się z klauzul.

Klauzula (clause)

Tabela (table), relacja (relation) – kolekcja danych zorganizowana w wiersze i kolumny

Kolumna (column), pole, atrybut (atribute), cecha

Wiersz (row), rekord (record), wpis (entry), encja (entity)

KONWENCJA JEZYKOWA

Znak końca instrukcji -; (średnik)

Klauzule zapisujemy wielkimi literami.

RDBMS

Relational DataBase Management System (System zarządzania relacyjną bazą danych)













DBMS DataBase Management System







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Search

What Is SQLite?

SQLite is a C-language library that implements a <u>small</u>, <u>fast</u>, <u>self-contained</u>, <u>high-reliability</u>, <u>full-featured</u>, SQL database engine. SQLite is the <u>most used</u> database engine in the world. SQLite is built into all mobile phones and most computers and comes bundled inside countless other applications that people use every day. <u>More Information...</u>

The SQLite <u>file format</u> is stable, cross-platform, and backwards compatible and the developers pledge to keep it that way <u>through the year 2050</u>. SQLite database files are commonly used as containers to transfer rich content between systems [1] [2] [3] and as a long-term archival format for data [4]. There are over 1 trillion (1e12) SQLite databases in active use [5].

SQLite source code is in the public-domain and is free to everyone to use for any purpose.

Latest Release

Version 3.36.0 (2021-06-18). Download Prior Releases

Common Links

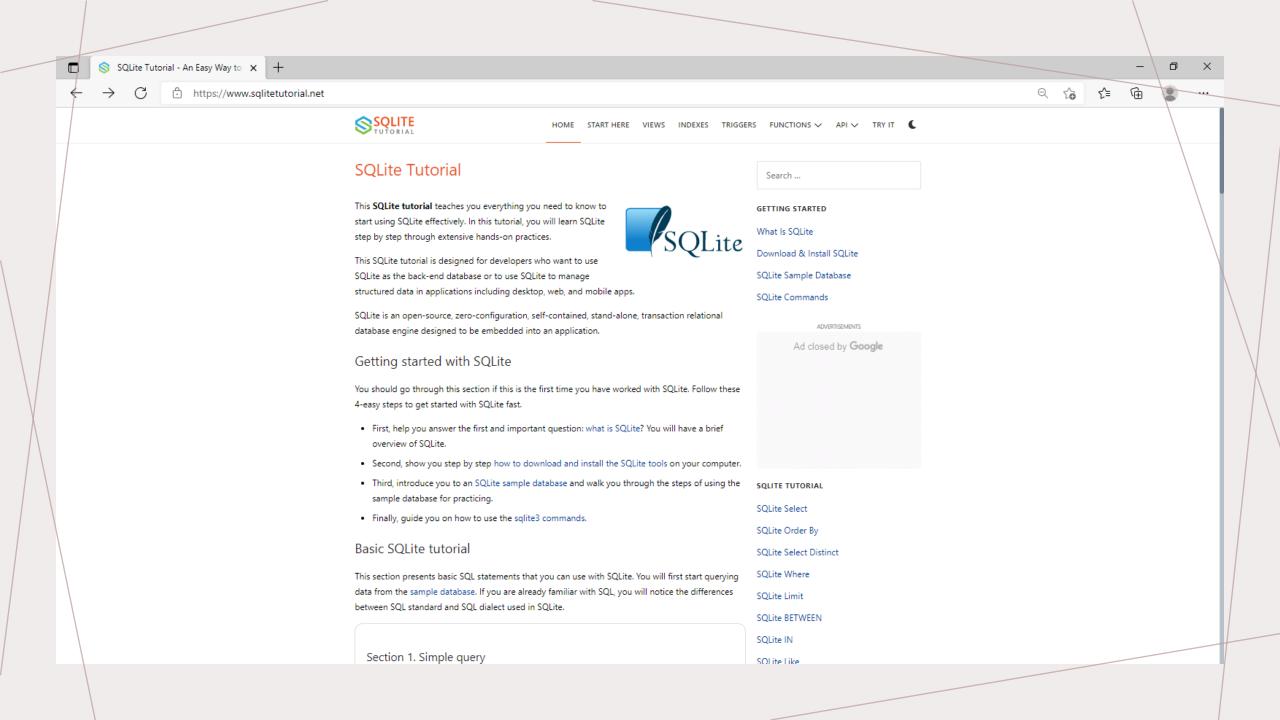
- Features
- · When to use SQLite
- · Getting Started
- Prior Releases
- SQL Syntax
 - Pragmas
 - SQL functions
 - Date & time functions
 - · Aggregate functions
 - Window functions
 - Math functions
 - JSON functions
- C/C++ Interface Spec
 - Introduction
 - List of C-language APIs
- · The TCL Interface Spec
- · Quirks and Gotchas
- · Frequently Asked Questions
- Commit History
- Bugs
- News

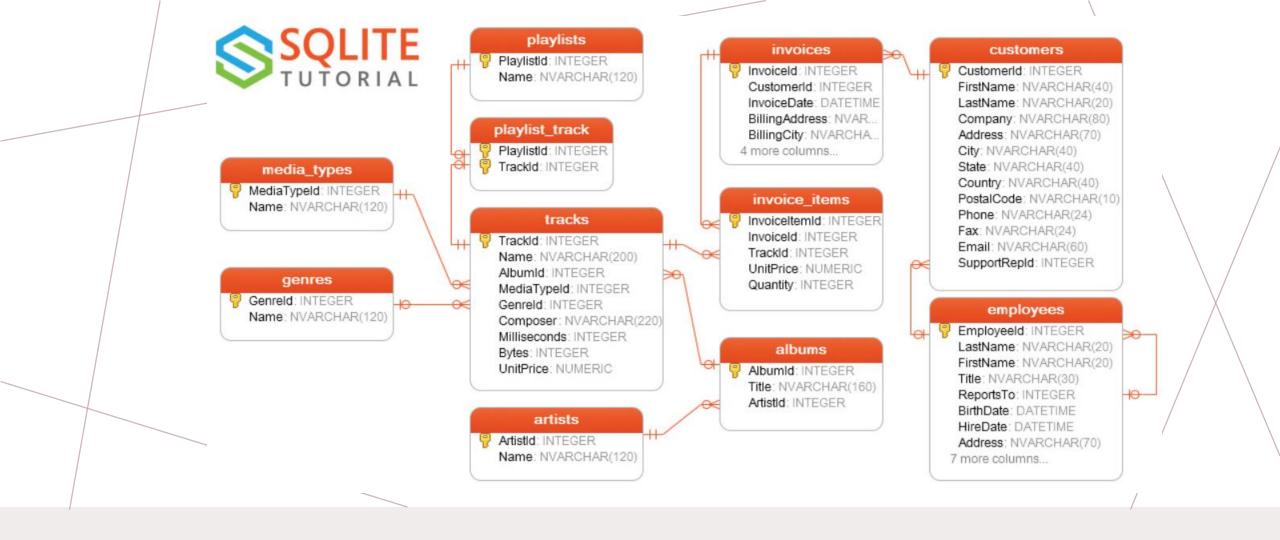
Ongoing development and support of SQLite is made possible in part by SQLite Consortium members, including:



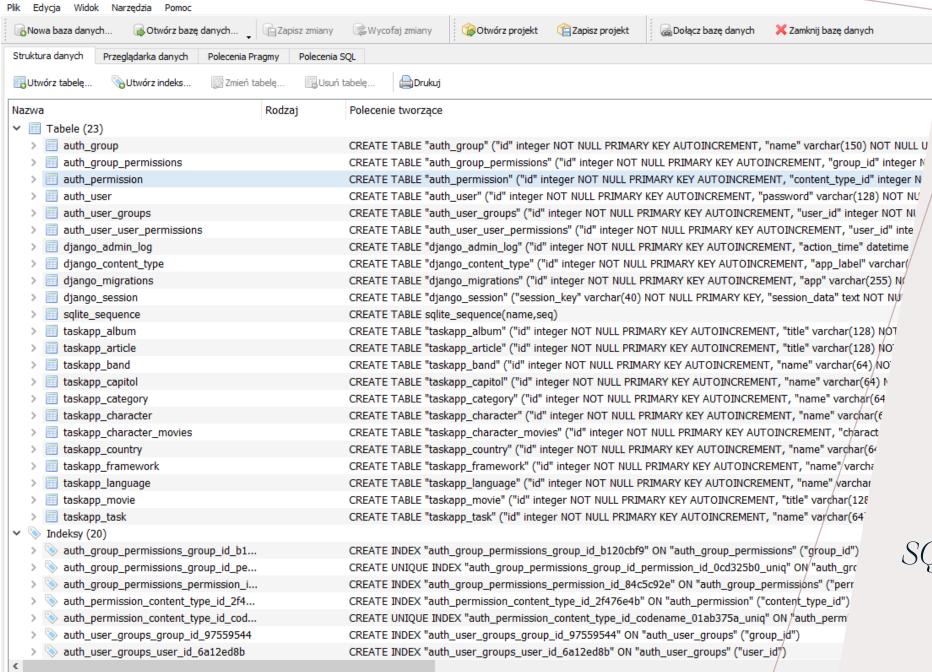








CHINOOK



B Browser for SQLite - C:\Users\jerem\PycharmProjects\ZDPYTpoI46_backend\db.sqlite3

SQLITE GUI CLIENT – DB BROWSER

```
C:\Users\jerem\PycharmProjects\ZDPYTpol46 backend>sqlite3.exe db.sqlite3
SQLite version 3.38.2 2022-03-26 13:51:10
Enter ".help" for usage hints.
sqlite> select * from django migrations;
1|contenttypes|0001 initial|2022-03-24 19:10:57.309449
2|auth|0001 initial|2022-03-24 19:10:57.370417
3|admin|0001 initial|2022-03-24 19:10:57.400400
4|admin|0002 logentry remove auto add|2022-03-24 19:10:57.424383
5|admin|0003 logentry add action flag choices|2022-03-24 19:10:57.449367
6|contenttypes|0002_remove_content_type_name|2022-03-24_19:10:57.491344
7|auth|0002 alter permission name max length|2022-03-24 19:10:57.516330
8|auth|0003 alter user email max length|2022-03-24 19:10:57.534318
9|auth|0004 alter user username opts|2022-03-24 19:10:57.553308
10|auth|0005_alter_user_last_login_null|2022-03-24 19:10:57.575310
11|auth|0006 require contenttypes 0002|2022-03-24 19:10:57.585290
12|auth|0007 alter validators add error messages|2022-03-24 19:10:57.604284
13|auth|0008_alter_user_username_max_length|2022-03-24 19:10:57.625283
14|auth|0009 alter user last name max length|2022-03-24 19:10:57.644256
15|auth|0010 alter group name max length|2022-03-24 19:10:57.667249
16|auth|0011 update proxy permissions|2022-03-24 19:10:57.682234
17|auth|0012 alter user first name max length|2022-03-24 19:10:57.707235
18|sessions|0001 initial|2022-03-24 19:10:57.729217
19|taskapp|0001 initial|2022-03-24 19:38:00.782212
20|taskapp|0002 band|2022-03-24 19:38:00.791208
21 taskapp 0003 category 2022-03-24 19:46:17.921446
22|taskapp|0004 alter category description|2022-03-24 19:47:03.022597
23 taskapp 0005 article 2022-03-24 19:55:11.537016
24 taskapp 0006 album 2022-03-24 20:03:30.393453
25|taskapp|0007 capitol language movie framework country character|2022-03-28 16:31:17.736793
26|taskapp|0008 album band|2022-03-28 16:50:35.520866
27|taskapp|0009 alter character table|2022-03-28 17:08:13.934086
28 taskapp 0010_alter_character_table 2022-03-28 17:10:53.656707
```

C:\Windows\System32\cmd.exe - sqlite3.exe db.sqlite3
Microsoft Windows [Version 10.0.19044.1586]

(c) Microsoft Corporation. Wszelkie prawa zastrzeżone.

SQLITE CLI CLIENT – SQLITE3







Try MySQL HeatWave for Free

Get US\$300 in credit for 30 days

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MySQL HeatWave

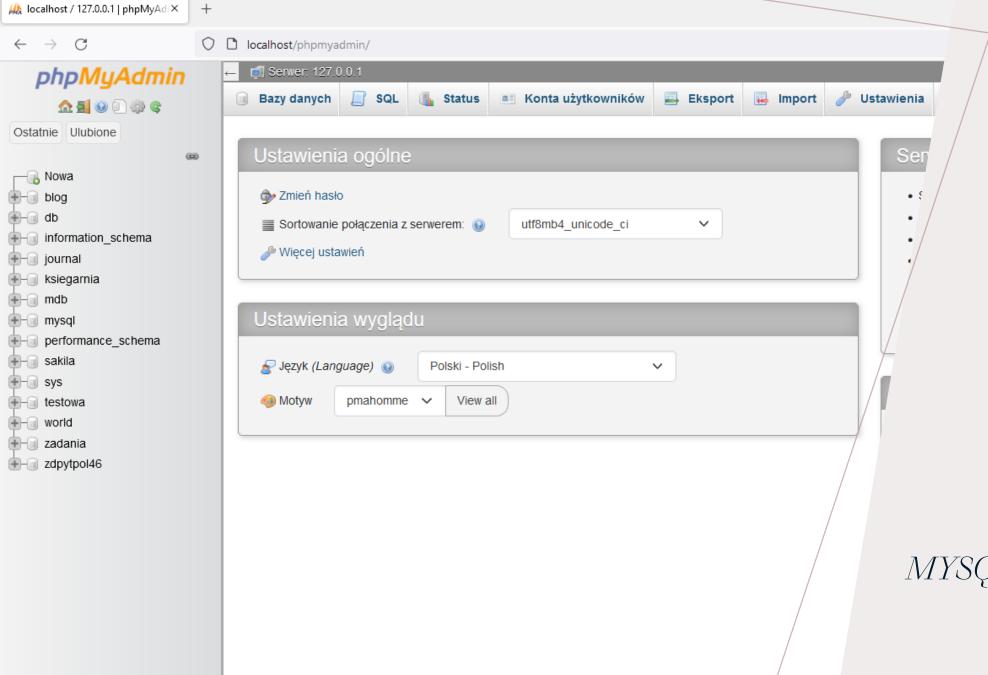
Learn More »

MySQL HeatWave is a fully managed service that enables customers to run OLTP and OLAP workloads directly from their MySQL Database. HeatWave, an integrated, highperformance query accelerator, boosts MySQL performance by 5400x.



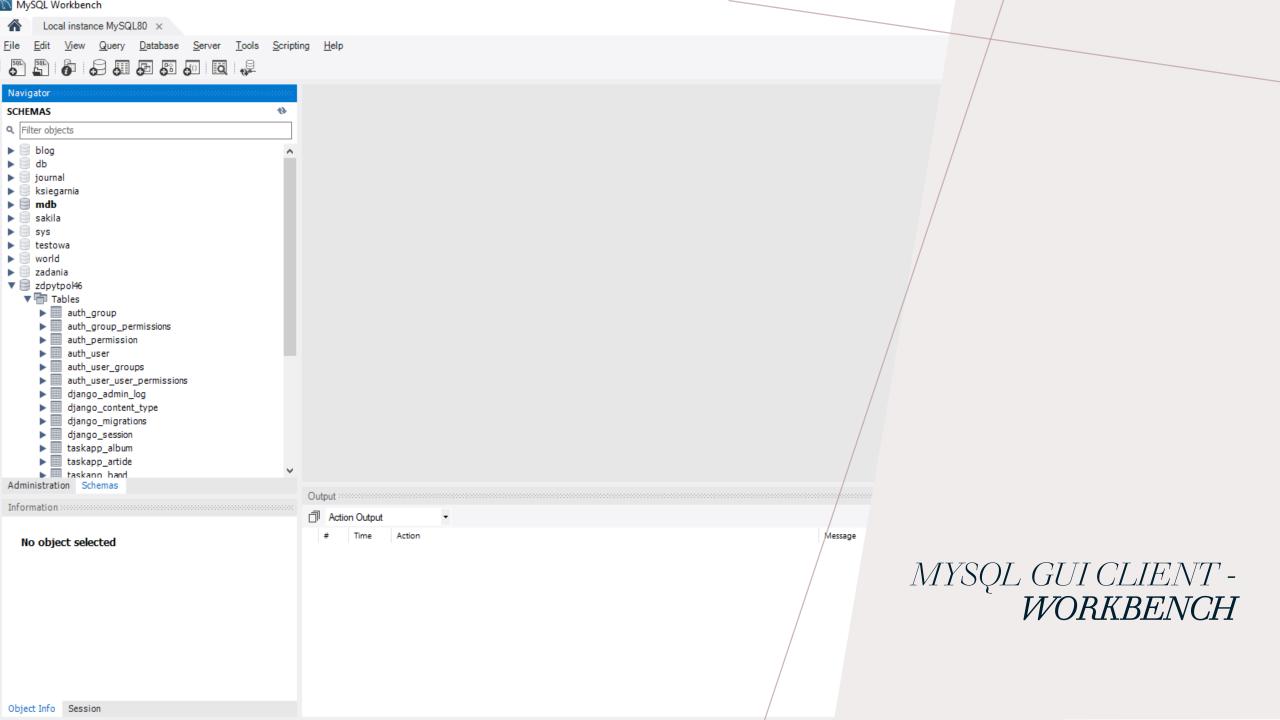
MySQL Enterprise Edition

The most comprehensive set of advanced features, management tools and technical support to achieve the highest levels of MySQL scalability, security, reliability, and uptime. Learn More »



Konsola

MYSQL GUI CLIENT – PHPMYADMIN



```
Enter password: *********
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySOL connection id is 20
Server version: 8.0.26 MySQL Community Server - GPL
Copyright (c) 2000, 2021, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> select * from zdpytpol46.django migrations;
      contenttypes
                     0001 initial
                                                                                2022-03-28 17:45:13.807284
      auth
                     0001 initial
                                                                                2022-03-28 17:45:14.926662
                     0001 initial
      admin
                                                                                2022-03-28 17:45:15.208500
      admin
                     0002 logentry remove auto add
                                                                                2022-03-28 17:45:15.227488
                     0003_logentry_add_action_flag_choices
      admin
                                                                                2022-03-28 17:45:15.244480
      contenttypes
                     0002 remove content type name
                                                                                2022-03-28 17:45:15.560297
  6
      auth
                      0002 alter permission name max length
                                                                                2022-03-28 17:45:15.674246
  8
      auth
                     0003 alter user email max length
                                                                                2022-03-28 17:45:15.710210
  9
      auth
                     0004_alter_user_username_opts
                                                                                2022-03-28 17:45:15.726201
 10
      auth
                     0005 alter user last login null
                                                                                2022-03-28 17:45:15.839137
 11
                     0006 require contenttypes 0002
      auth
                                                                                2022-03-28 17:45:15.844132
                     0007 alter validators add error messages
 12
      auth
                                                                                2022-03-28 17:45:15.858125
 13
                     0008 alter user username max length
      auth
                                                                                2022-03-28 17:45:15.989051
 14
      auth
                     0009 alter user last name max length
                                                                                2022-03-28 17:45:16.086009
                     0010 alter group name max length
 15
      auth
                                                                                2022-03-28 17:45:16.125987
 16
      auth
                     0011 update proxy permissions
                                                                                2022-03-28 17:45:16.140977
                     0012_alter_user_first_name_max_length
 17
      auth
                                                                                2022-03-28 17:45:16.255906
                     0001 initial
 18
      sessions
                                                                                2022-03-28 17:45:16.308865
                     0001 initial
 19
      taskapp
                                                                                2022-03-28 17:45:16.354856
 20
      taskapp
                     0002 band
                                                                                2022-03-28 17:45:16.393835
 21
      taskapp
                      0003 category
                                                                                2022-03-28 17:45:16.438843
 22
      taskapp
                     0004 alter category description
                                                                                2022-03-28 17:45:16.500810
                     0005 article
 23
      taskapp
                                                                                2022-03-28 17:45:16.542807
 24
      taskapp
                     0006 album
                                                                                2022-03-28 17:45:16.596777
                     0007 capitol language movie framework country character
 25
      taskapp
                                                                               2022-03-28 17:45:17.217439
     taskapp
                                                                                2022-03-28 17:45:17.330310
26 rows in set (0.00 sec)
```

MYSQL CLI CLIENT -MYSQL

mysql>

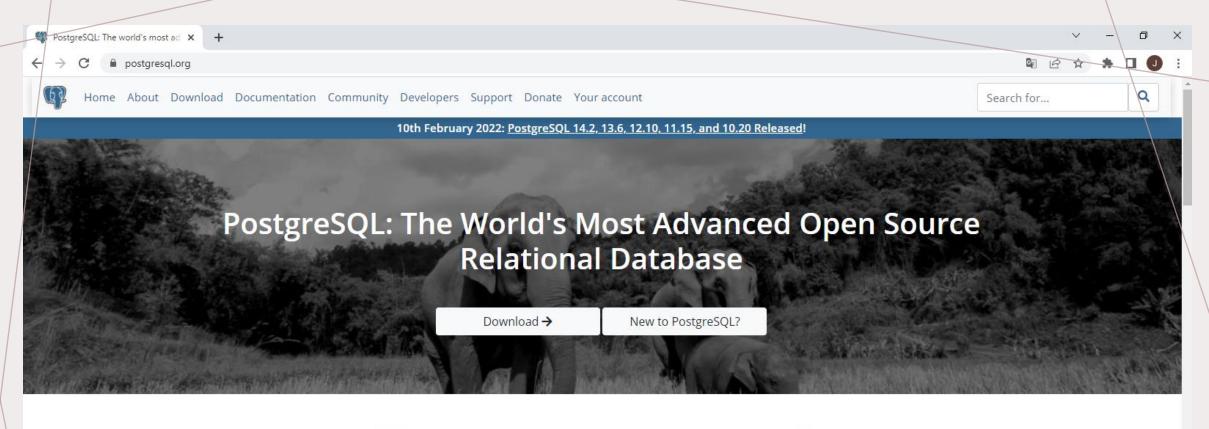
Wiersz polecenia - mysql -u root -p

C:\Users\jerem>mysql -u root -p

Microsoft Windows [Version 10.0.19044.1586]

(c) Microsoft Corporation. Wszelkie prawa zastrzeżone.









New to PostgreSQL?

PostgreSQL is a powerful, open source object-relational database system with over 30 years of active development that has earned it a strong reputation for reliability, feature robustness, and performance.

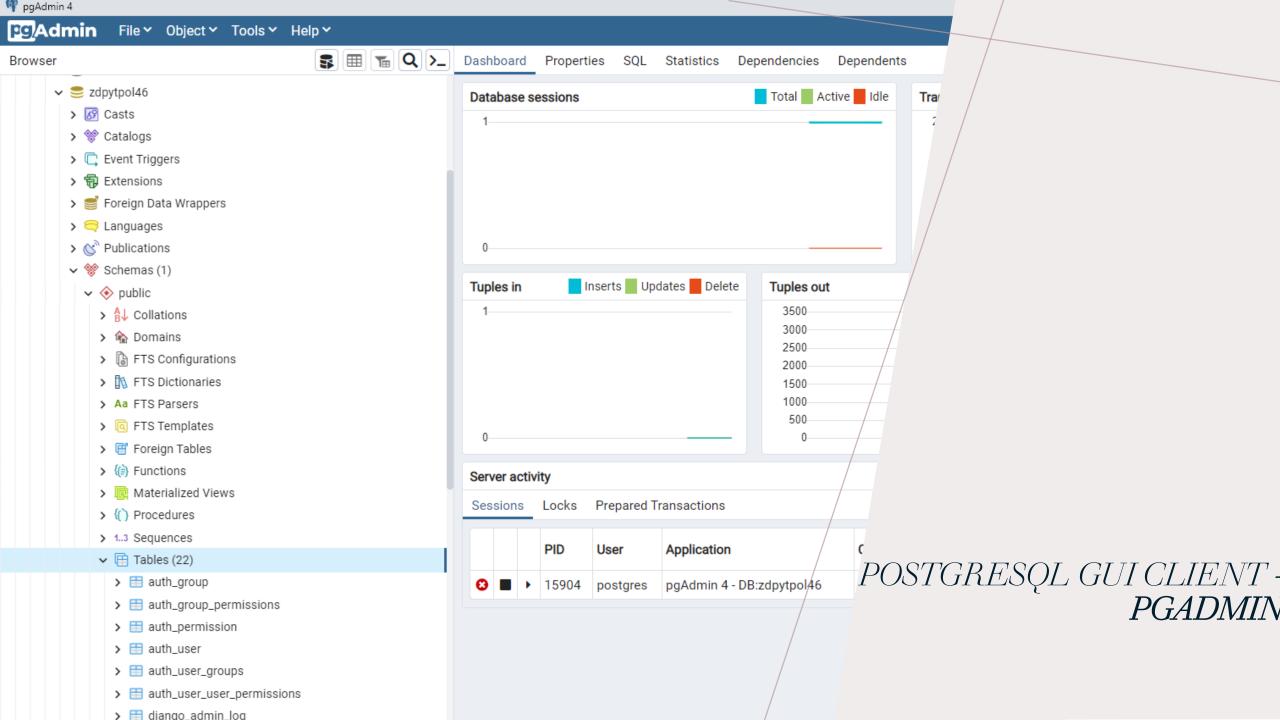
There is a wealth of information to be found describing how to install and use PostgreSQL through the official documentation. The PostgreSQL community provides many helpful places to become familiar with the technology, discover how it works, and find career

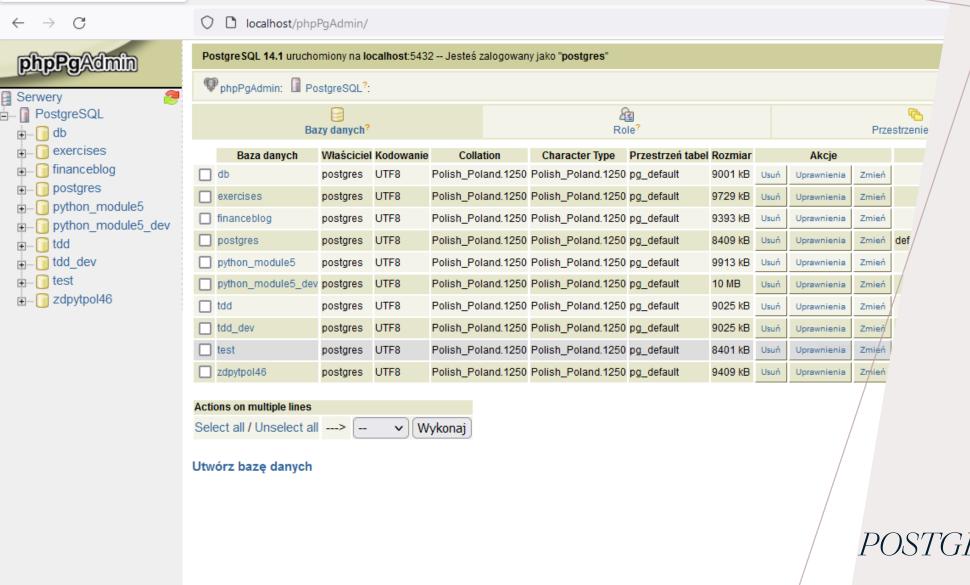
Latest Releases

2022-02-10 - PostgreSQL 14.2, 13.6, 12.10, 11.15, and 10.20 Released!

The PostgreSQL Global Development Group has released an update to all supported versions of our database system, including 14.2, 13.6, 12.10, 11.15, and 10.20. This release fixes over 55 bugs reported over the last three months.

For the full list of changes, please review the release notes.





phpPgAdmin

×

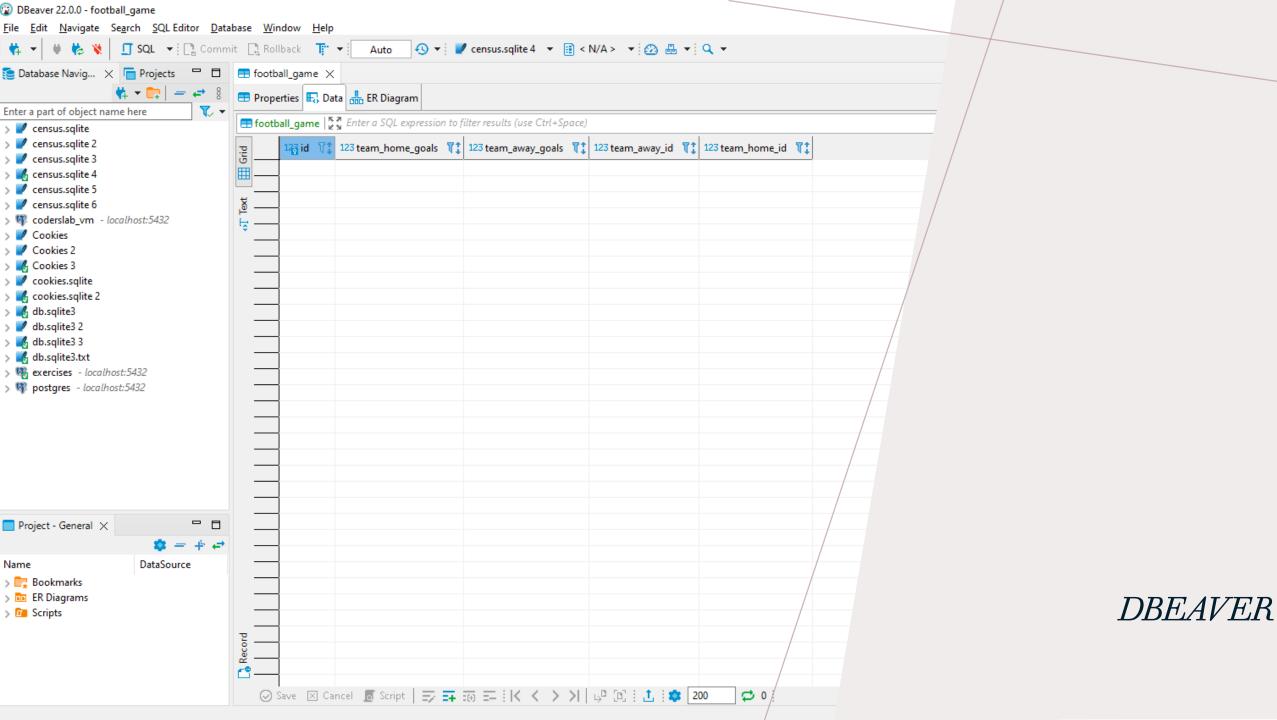
POSTGRESQL GUI CLIENT -PHPPGADMIN

```
SQL Shell (psql)
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:
psql (14.1)
WARNING: Console code page (852) differs from Windows code page (1250)
         8-bit characters might not work correctly. See psql reference
         page "Notes for Windows users" for details.
Type "help" for help.
postgres=# \c zdpytpol46
You are now connected to database "zdpytpol46" as user "postgres".
zdpytpol46=# select * from django_migrations;
id
                                                                                                applied
          app
                      0001 initial
                                                                                    2022-03-28 19:28:11.83978+02
      contenttypes
 2
                      0001 initial
      auth
                                                                                    2022-03-28 19:28:12.010683+02
      admin
                      0001 initial
                                                                                    2022-03-28 19:28:12.050658+02
                      0002 logentry remove auto add
      admin
                                                                                    2022-03-28 19:28:12.068648+02
                      0003 logentry add action flag choices
      admin
                                                                                    2022-03-28 19:28:12.07964+02
 6
                      0002 remove content type name
      contenttypes
                                                                                    2022-03-28 19:28:12.116621+02
                      0002 alter permission name max length
                                                                                    2022-03-28 19:28:12.128614+02
      auth
 8
                      0003 alter user email max length
      auth
                                                                                    2022-03-28 19:28:12.142609+02
      auth
                      0004 alter user username opts
                                                                                    2022-03-28 19:28:12.153598+02
10
                      0005 alter user last login null
      auth
                                                                                    2022-03-28 19:28:12.164591+02
11
                      0006 require contenttypes 0002
                                                                                    2022-03-28 19:28:12.166591+02
      auth
12
                      0007 alter validators add error messages
      auth
                                                                                    2022-03-28 19:28:12.176586+02
13
                      0008 alter user username max length
      auth
                                                                                    2022-03-28 19:28:12.201572+02
14
                      0009 alter user last name max length
      auth
                                                                                    2022-03-28 19:28:12.212564+02
15
                      0010 alter group name max length
                                                                                    2022-03-28 19:28:12.234551+02
      auth
16
      auth
                      0011 update proxy permissions
                                                                                    2022-03-28 19:28:12.245545+02
17
                      0012 alter user first name max length
      auth
                                                                                    2022-03-28 19:28:12.25454+02
18
                      0001 initial
      sessions
                                                                                    2022-03-28 19:28:12.279527+02
19
                      0001 initial
                                                                                    2022-03-28 19:28:12.287522+02
      taskapp
20
                      0002 band
      taskapp
                                                                                    2022-03-28 19:28:12.303513+02
21
      taskapp
                      0003 category
                                                                                    2022-03-28 19:28:12.322503+02
22
                      0004 alter category description
      taskapp
                                                                                    2022-03-28 19:28:12.3295+02
23
                      0005 article
      taskapp
                                                                                    2022-03-28 19:28:12.351487+02
24
                      0006 album
      taskapp
                                                                                    2022-03-28 19:28:12.362479+02
25
                      0007 capitol language movie framework country character
      taskapp
                                                                                   2022-03-28 19:28:12.453437+02
     taskapp
                      0008 album band
                                                                                    2022-03-28 19:28:12.467426+02
(26 rows)
```

POSTGRESQL CLI CLIENT -**PSOL**

zdpytpol46=#

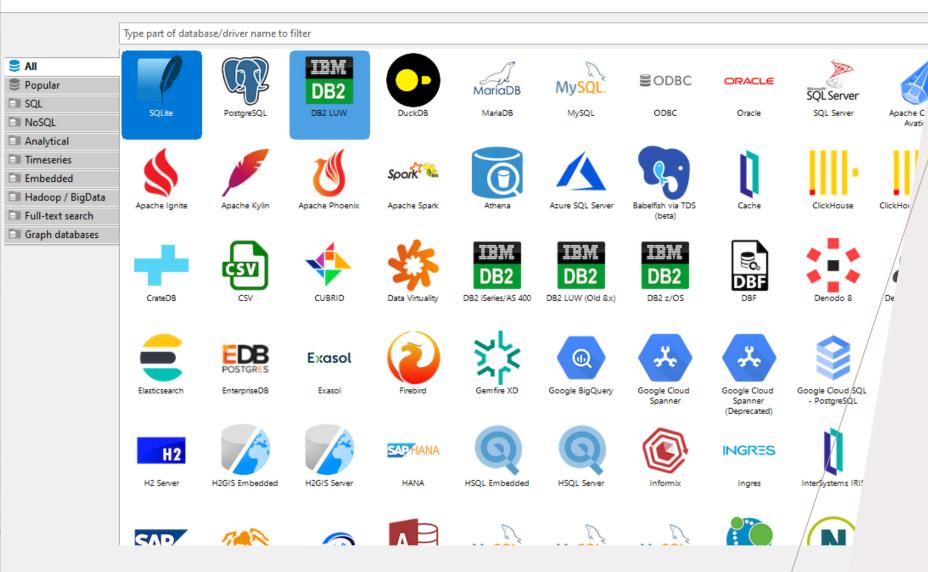
KLIENCI OGOLNEGO PRZEZNACZENIA



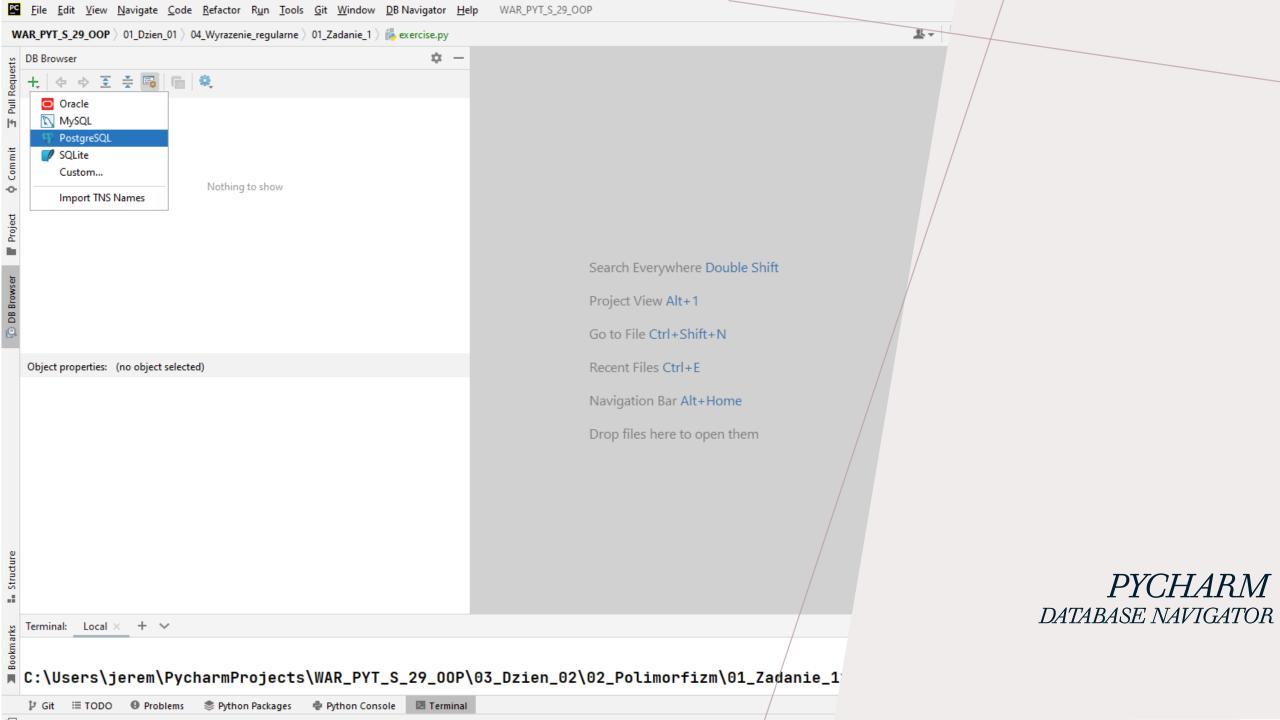
Connect to a database

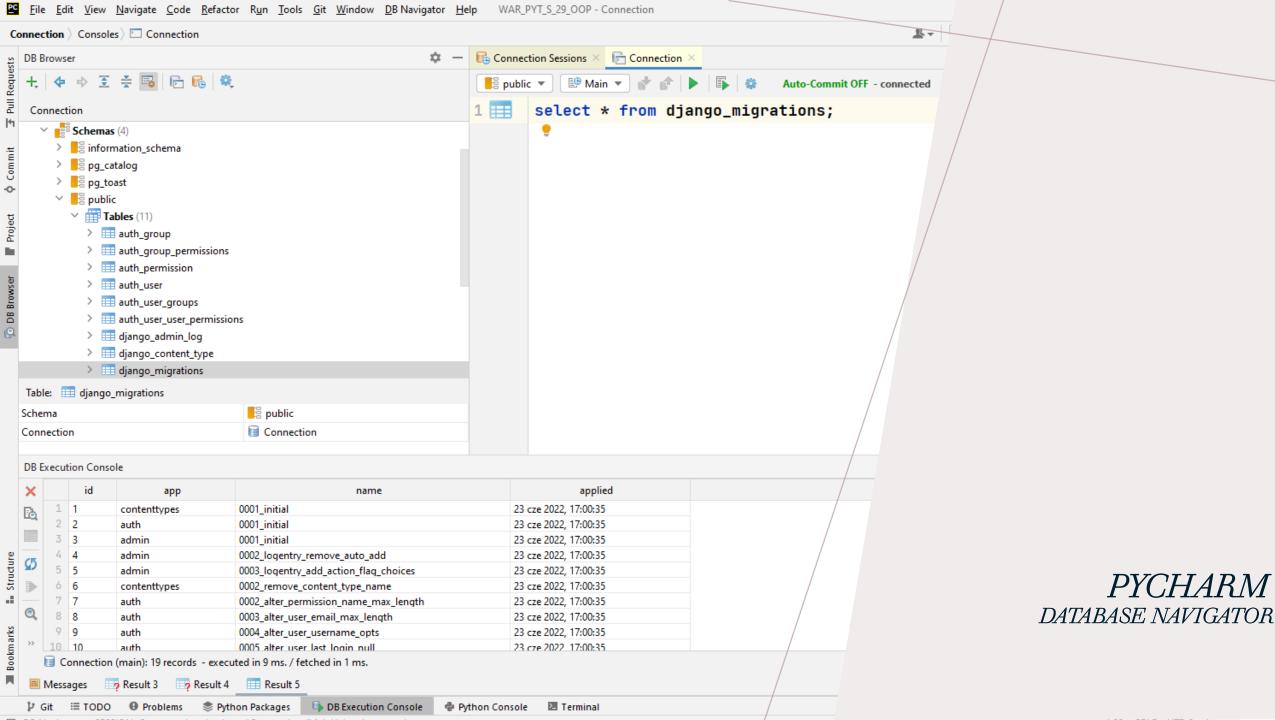
Select your database

Create new database connection. Find your database driver in the list below.



DBEAVER

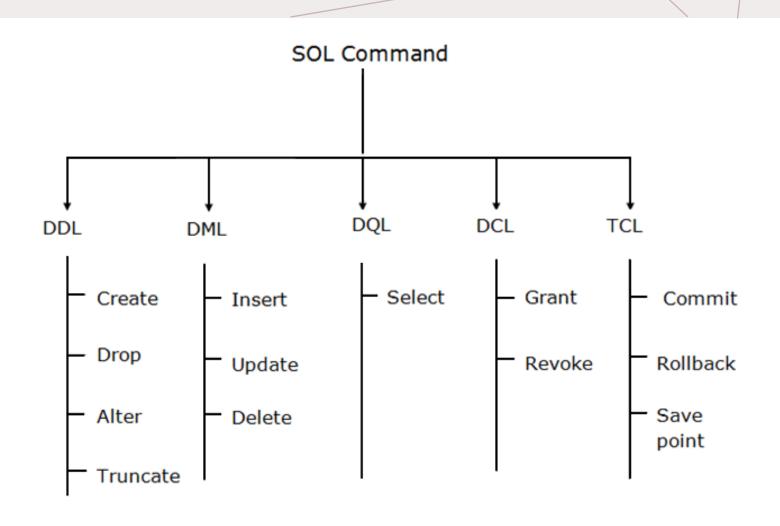


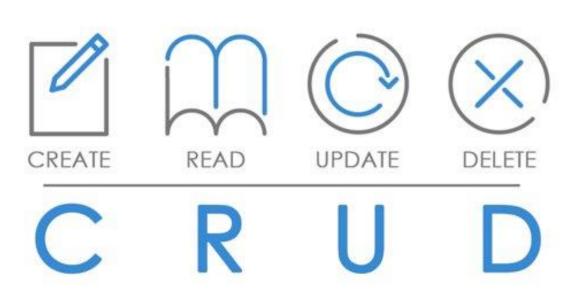


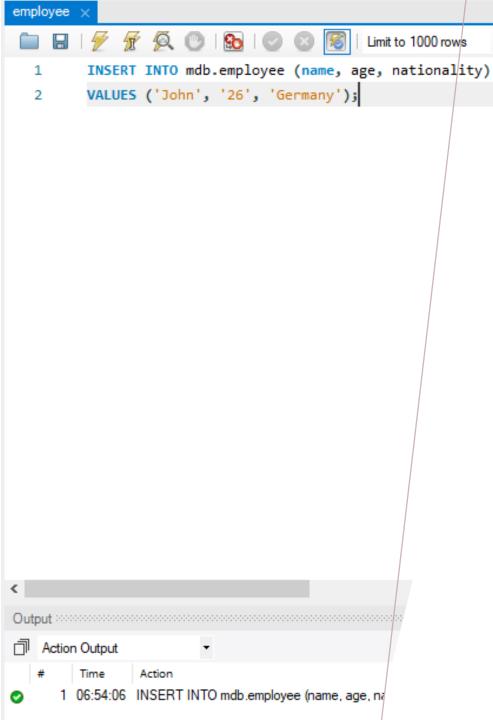
PYCHARM

PODSTAWOWE INSTRUKCJE SQL

- DDL Data Definition Language
- DML Data Manipulation Language
- DQL Data Query Language
- DCL Data Control Language
- TCL Transaction Control Language

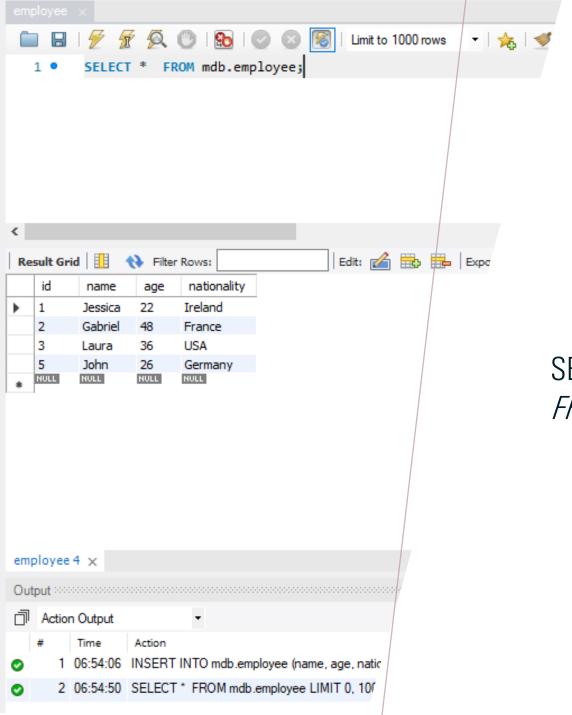






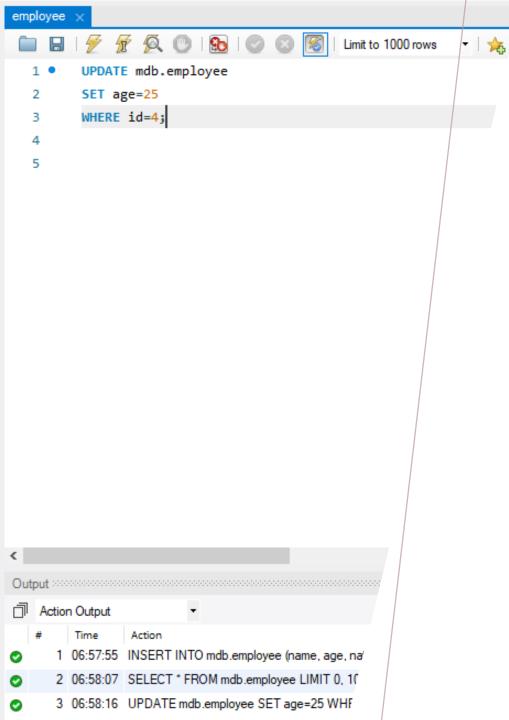
C - Create (DML)

INSERT INTO table_name (column1, column2, column3, ...) VALUES (value1, value2, value3, ...);



R - Read (DQL)

SELECT *column1*, *column2*, ... *FROM table_name*;

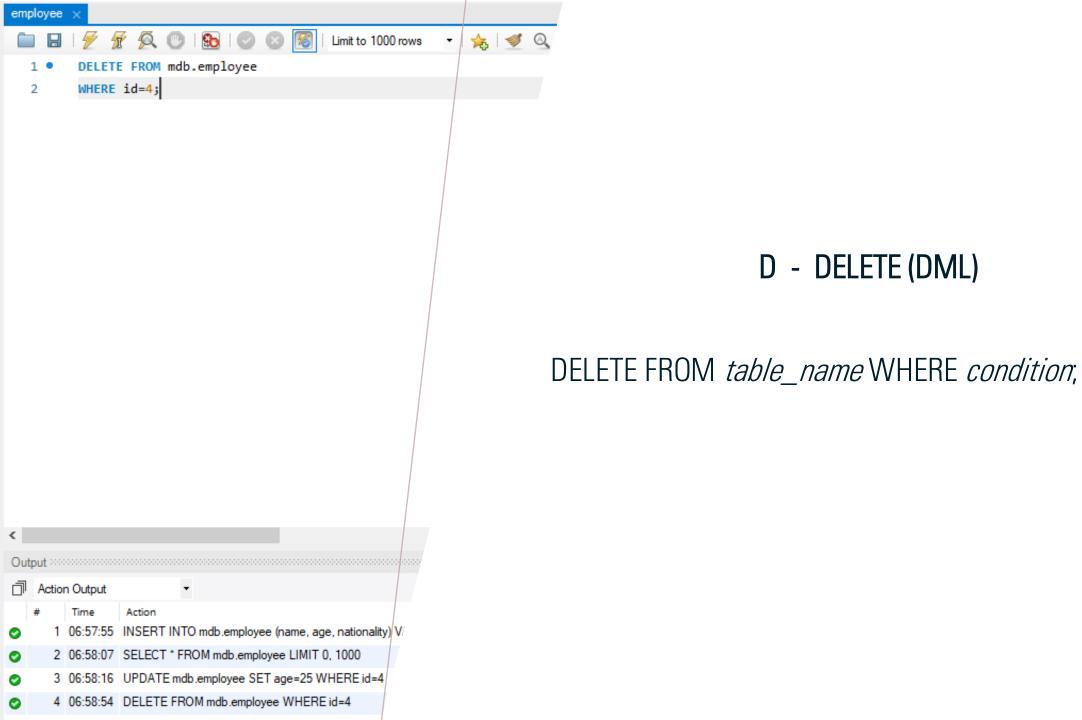


U - UPDATE (DML)

UPDATE table_name

SET column1 = value1, column2 = value2, ...

WHERE condition;





ZLACZENIA (JOINS)

• INNER JOIN

Self-join

OUTER JOIN

• LEFT JOIN

• RIGHT JOIN

• FULL JOIN

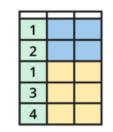
• CROSS JOIN

• Semi-join / Anti-join



1		
2		
3		
4		

Left Join 🔘



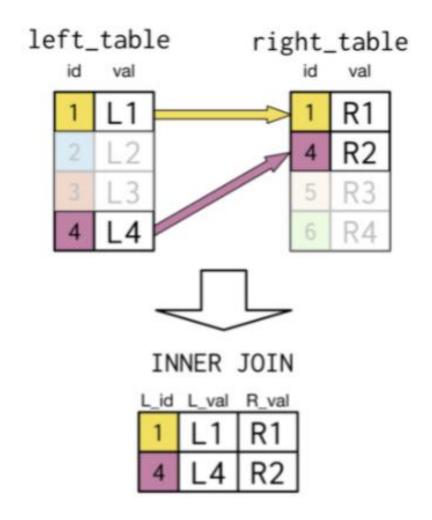
Union O+O



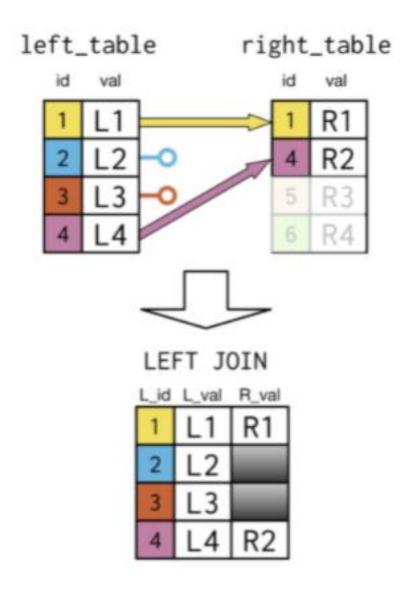


Cross Join



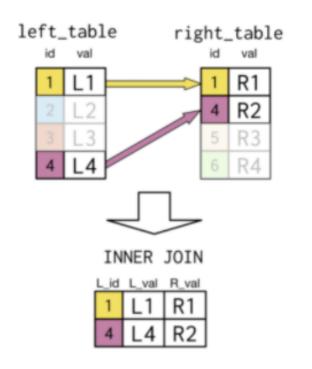


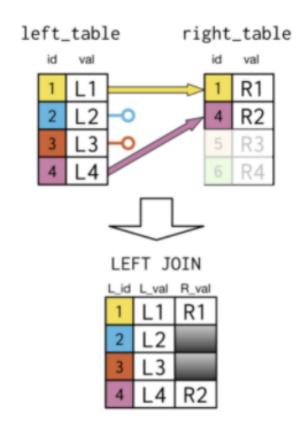
INNER JOIN (AKA JOIN)



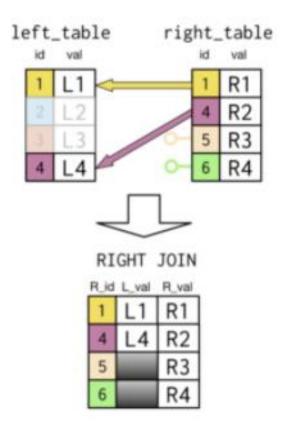
LEFT JOIN (AKA LEFT OUTER JOIN)

INNER JOIN vs LEFT JOIN





INNER JOIN VS LEFT JOIN



SELECT right_table.id AS R_id,

left_table.val AS L_val,

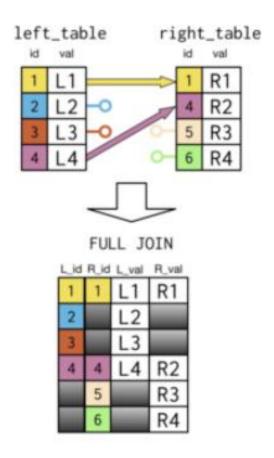
right_table.val AS R_val

FROM left_table

RIGHT JOIN right_table

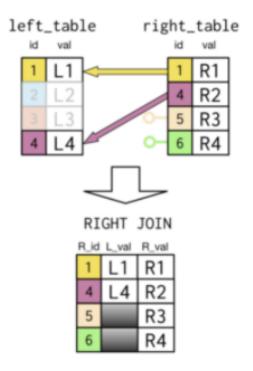
ON left_table.id = right_table.id;

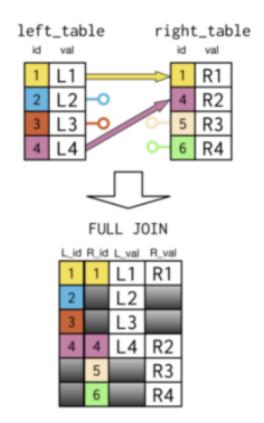
RIGHT JOIN (AKA RIGHT OUTER JOIN)



FULL JOIN (AKA FULL OUTER JOIN)

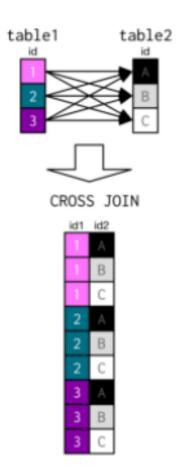
RIGHT JOIN vs FULL JOIN





RIGHT JOIN VS FULL JOIN

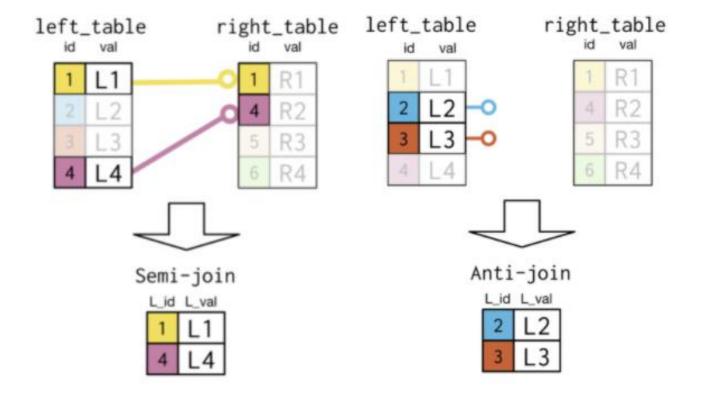
CROSS JOIN with code



```
SELECT table1.id AS id1,
table2.id AS id2
FROM table1
CROSS JOIN table2;
```

CROSS JOIN

Semi-join and anti-join diagrams



SEMI-JOIN ANTI-JOIN



INDEKSY

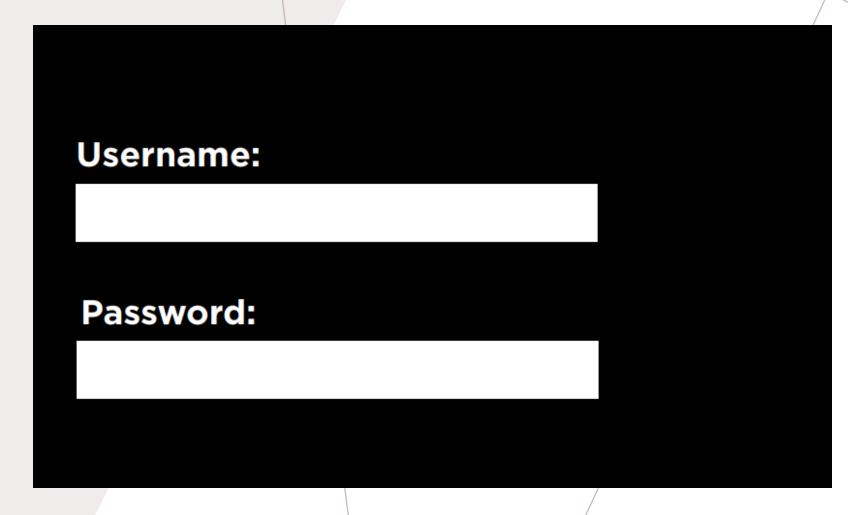
ID	TOWAR	
1	Herbata	
2	Kawa	
3	Cukier	
4	Mleko	
5	Ciastka	
6	Owoce	
7	Napoje	

INDEKSY

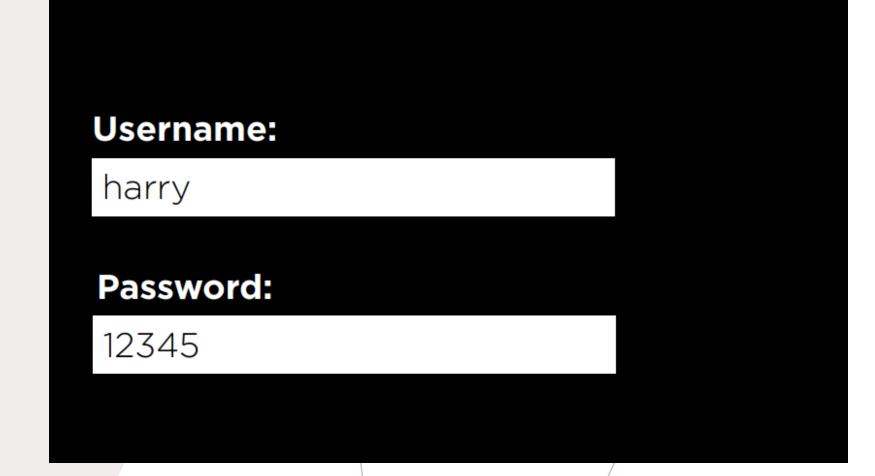


TOWAR



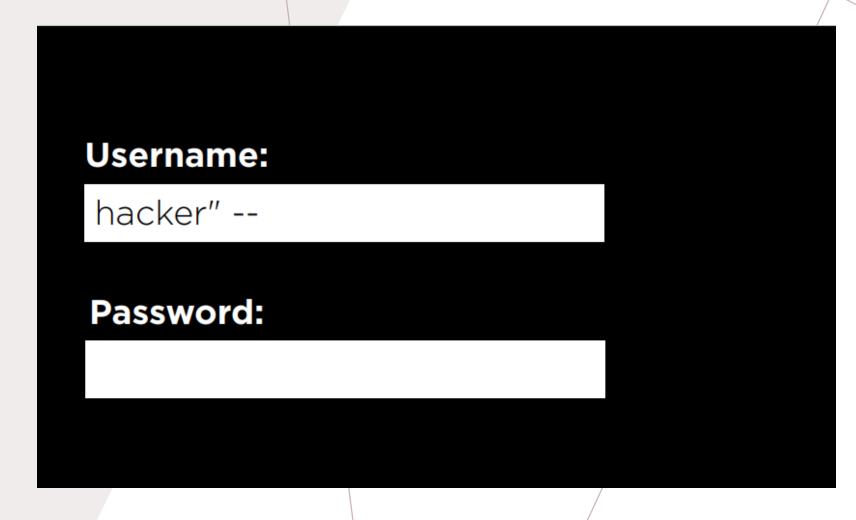


```
SELECT * FROM users
WHERE username = username AND password = password;
```



```
SELECT * FROM users
WHERE username = username AND password = password;
```

```
SELECT * FROM users
WHERE username = "harry" AND password = "12345";
```



```
SELECT * FROM users
WHERE username = username AND password = password;
```

```
SELECT * FROM users
WHERE username = "hacker"--" AND password = "";
```

```
SELECT * FROM users
WHERE username = "hacker"--" AND password = "";
```





ARCHITEKTURA KLIENT-SERWER





ARCHITEKTURA KLIENT-SERWER





ARCHITEKTURA KLIENT-SERWER