AT82.02

DATA MODELING AND MANAGEMENT

UNIT 1-2: RDBMS

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Co-funded by the Erasmus+ Programme of the European Union

DS&AI

Major parts of these slides on RDBMS are based on the slides prepared by José Machado, Paulo Novais and Regina Sousa, University of Minho

UNDER THE DS&AI PROJECT

RELATIONAL DATABASE MANAGEMENT SYSTEMS (RDBMS)

Database

A database is a set of data stored in a computer. This data is usually structured in a way that makes the data easily accessible.

Relational Database

A relational database is a type of database. It uses a structure that allows us to identify and access data in relation to another piece of data in the database. Often, data in a relational database is organized into tables.

Relational Database Management System

A relational database management system (RDBMS) is a program that allows you to create, update, and administer a relational database. Most relational database management systems use the SQL language to access the database.

RDBMS VS. DBMS

An RDBMS is a type of database management system (DBMS) that stores data in a table which connects related data elements.

- A RDBMS includes functions that maintain data security, accuracy, integrity and consistency;
- The data is stored in table form;
- Supports multiple users;
- supports client-server architecture
- It has high software and hardware requirements
- Keys and indexes do not allow data redundancy.

- It does not apply any security protocol with respect to data manipulation.
- The DBMS stores the data as an archive;
- Supports only one user;
- Does not support client-server architecture;
- Requires few software and hardware requirements
- It does not take into account the concept of standardization, leading to redundancy in data.

ADVANTAGES OF RELATIONAL DATABASE MANAGEMENT SYSTEMS

Data Structure

The table format is basic and easy to use and understand for database users. RDBMS allow data to be accessed via a native structure and organization of the data. Database queries can search each column for corresponding entries.

Maintenance

RDBMS have maintenance programs that provide administrators with tools to simply maintain, test, repair and back up the databases hosted on the system. Many of the features can be automized through the built-in automation in the RDBMS.

Network Access

RDBMS provide access to the database through a server daemon, a dedicated software program that listens for requests on a network and allows database clients to connect to and use the database.

ADVANTAGES OF RELATIONAL DATABASE MANAGEMENT SYSTEMS

Multi-User Access

RDBMS allow several users to access a database synchronously. Built-in lock and transaction management features help users access data as it is being changed, prevent conflicts between two users who are updating data, and prevent users from accessing partially updated records.

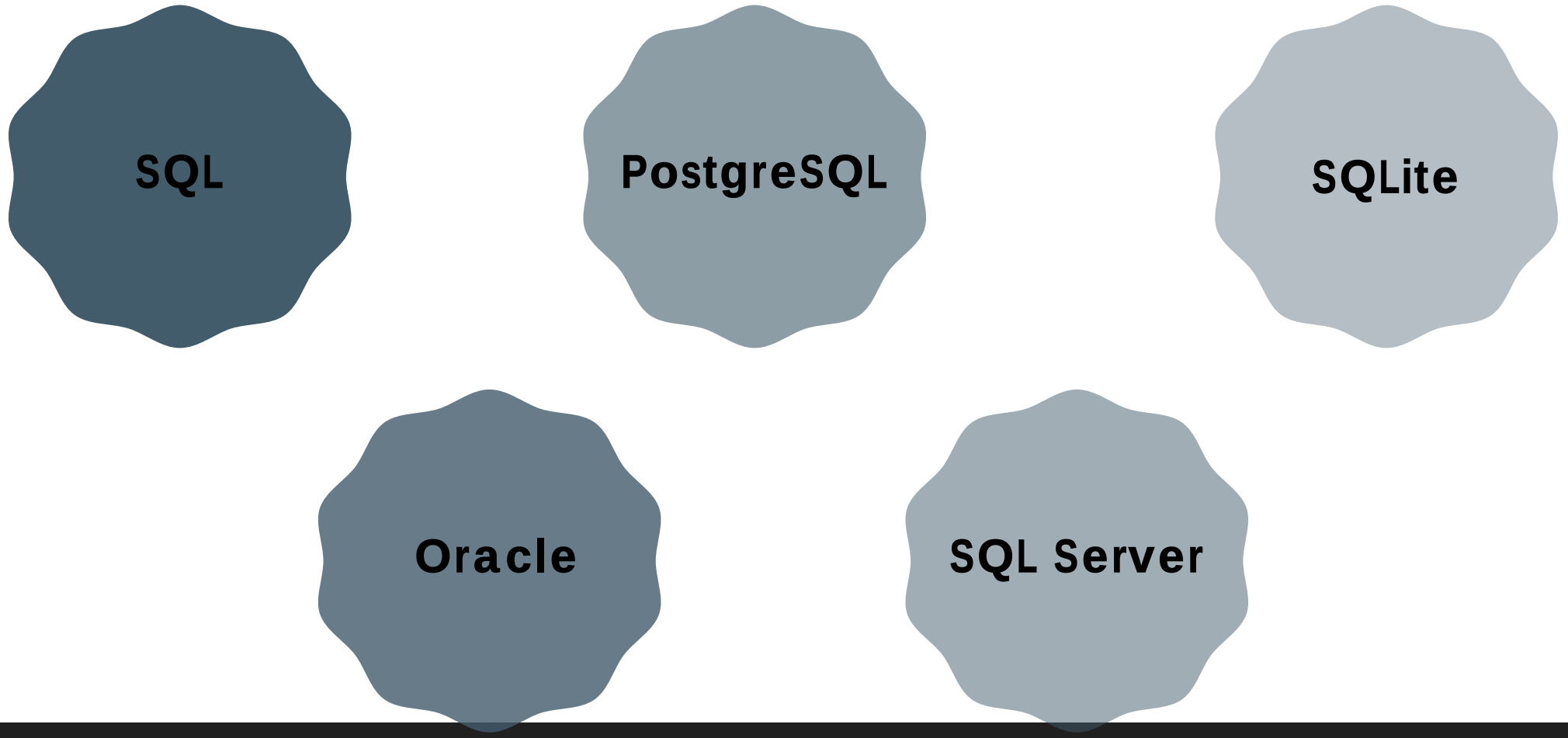
Privileges

Authorization and privilege control features in an RDBMS allow the database administrator to restrict access to authorized users, and grant privileges to individual users based on the types of database tasks they need to perform. Authorization can be defined based on the remote client IP address in combination with user authorization, restricting access to specific external computer systems.

Language

RDBMSs support a generic language called "Structured Query Language" (SQL). The SQL syntax is simple, and the language uses standard English language keywords and phrasing, making it fairly intuitive and easy to learn. Many RDBMSs add non-SQL, database-specific keywords, functions and features to the SQL language.

POPULAR RELATIONAL DATABASE MANAGEMENT SYSTEMS



359 systems in ranking, August 2020

Rank			DBMS	Database Model	Score		
Aug 2020	Jul 2020	Aug 2019			Aug 2020	Jul 2020	Aug 2019
1.	1.	1.	Oracle	Relational, Multi-model	1355.16	+14.90	+15.68
2.	2.	2.	MySQL	Relational, Multi-model	1261.57	-6.93	+7.89
3.	3.	3.	Microsoft SQL Server	Relational, Multi-model	1075.87	+16.15	-17.30
4.	4.	4.	PostgreSQL	Relational, Multi-model	536.77	+9.76	+55.43
5.	5.	5.	MongoDB	Document, Multi-model	443.56	+0.08	+38.99
6.	6.	6.	IBM Db2	Relational, Multi-model	162.45	-0.72	-10.50
7.	↑ 8.	↑ 8.	Redis	Key-value, Multi-model	152.87	+2.83	+8.79
8.	↓ 7.	↓ 7.	Elasticsearch	Search engine, Multi-model	152.32	+0.73	+3.23
9.	9.	↑ 11.	SQLite	Relational	126.82	-0.64	+4.10
10.	↑ 11.	↓ 9.	Microsoft Access	Relational	119.86	+3.32	-15.47

DB-Engines Ranking

https://db-engines.com/en/ranking

MySQL

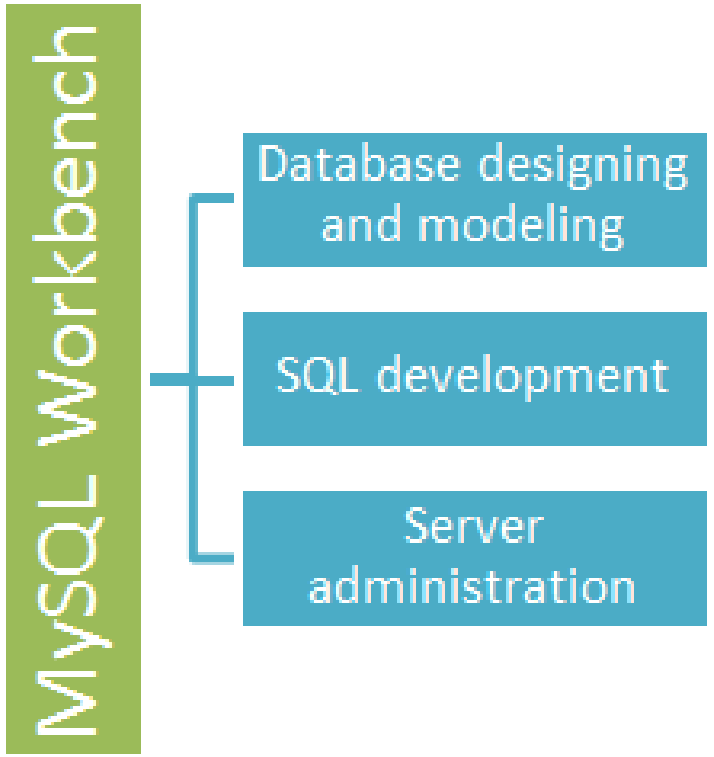
MySQL
What is MySQL?
Why use MySQL?

MySQL Workbench

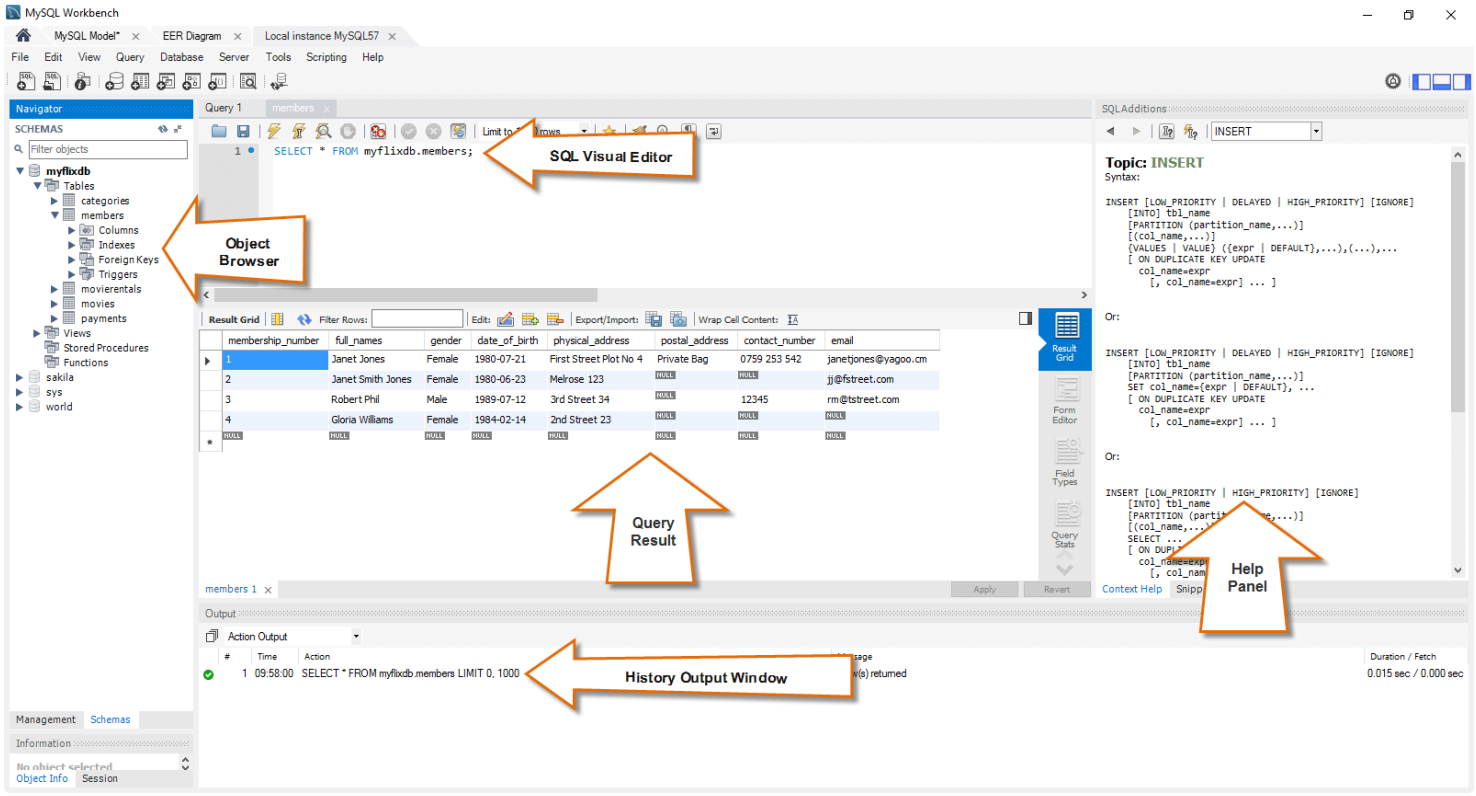
An integrated development environment for MySQL server.

A Visual database designing and modeling access tool for MySQL server relational database.

Facilitates creation of new physical data models and modification of existing MySQL databases with reverse/forward engineering and change management functions.



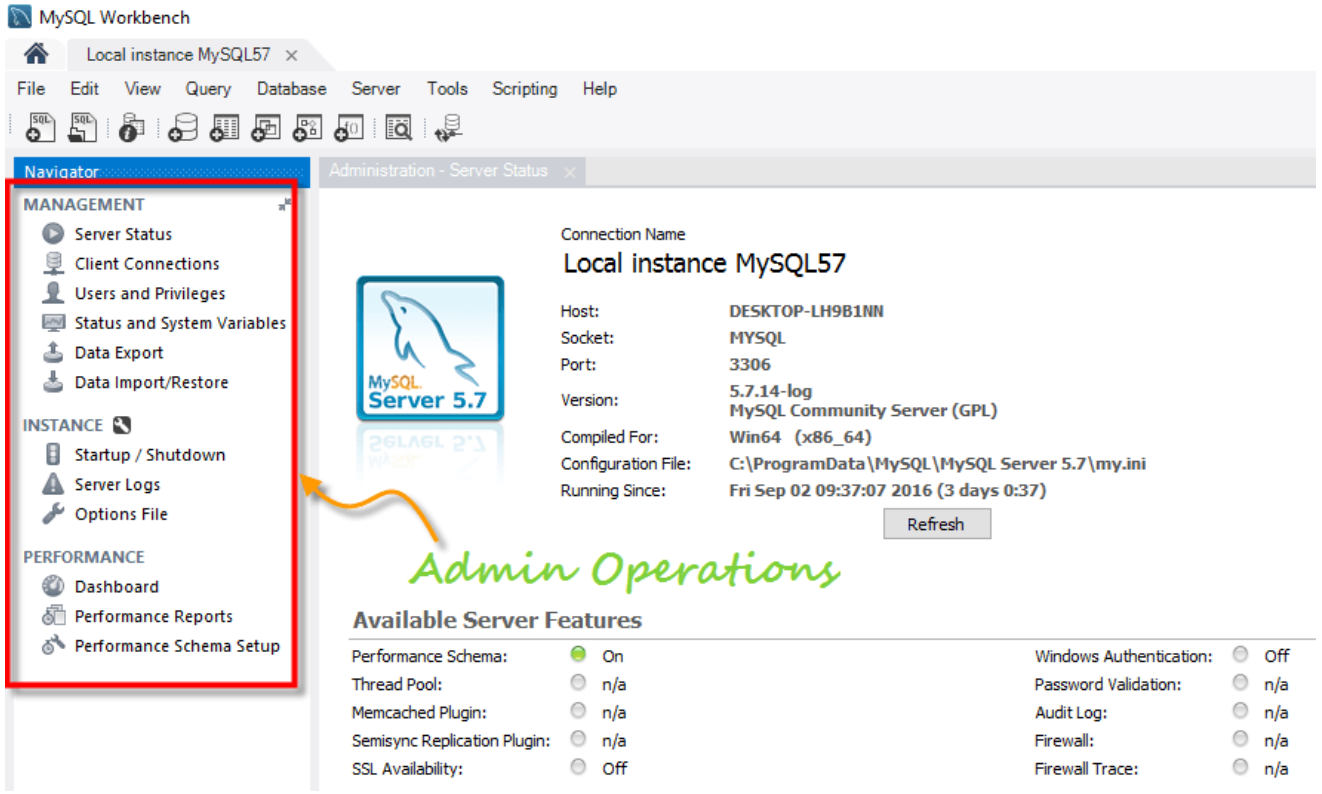
MySQL workbench - SQL development tool



MySQL workbench - Administration tool

- User administration
- Server configuration
- Database backup and restorations
- Server logs

MySQL workbench - Administration tool



References

MYSQL WORKBENCH TUTORIAL & MYSQL INTRODUCTION
HTTPS://WWW.GURU99.COM/INTRODUCTION-TO-MYSQL-WORKBENCH.HTML
MYSQL TUTORIAL HTTPS://WWW.GURU99.COM/MYSQL-TUTORIAL.HTML


Thank you.
Exit Slip:
Discuss 3 important things / concepts we have learned today.