

# Introduction to database

## Relational Database Management Systems

El Hadji Alassane DIENG  
elhadjialassane.dieng30@gmail.com

GoMyCode

October 21, 2021

# SUMMARY

## INTRODUCTION

- ▶ MYSQL
- ▶ PostgreSQL
- ▶ SQL SERVER

# Introduction

## introduction

As you noticed , we currently live in a world leeded by those with a monopoly on informations. Thus we use databases for storing and managing informations or data . A database is a structured set of information designed and produced to be easily accessed , managed and modified by several users.A DataBase Management System (DBMS) is used to store information in a database. Using a DBMS, we can find, sort, transform and select information stored in database. We will explain three RDBMS like : MYSQL , PostgreSQL , SQL SERVER.

# MYSQL

## MYSQL

It is free software, open source, developed under a dual license depending on whether it is distributed with a free product or with a proprietary product. In the latter case, the license is chargeable, otherwise the GNU General Public License (GPL) applies. Software which integrates MySQL code or integrates MySQL during its installation must therefore be free or acquire a paid license.

However, if the database is separate from the software owner who only uses third-party APIs (eg in C or php), then there is no need to acquire a paid MySQL license. This type of dual license is used by other products such as the Qt software development framework (for versions prior to 4.5)

## SUPPORTED OPERATING SYSTEMS

MySQL runs on many different operating systems including AIX, IBM i-5, BSDi, FreeBSD, HP-UX, Linux, Mac OS X, NetWare, NetBSD, OpenBSD, OS / 2 Warp, SGI IRIX, Solaris, SCO OpenServer, SCO UnixWare, Tru64 Unix, Windows.

The databases are accessible using the programming languages C, C ++, VB, VB .NET, C , Delphi / Kylix, Eiffel, Java, Perl, PHP, Python, Windev, Ruby and Tcl; a specific API is available for each of them. An ODBC interface called MyODBC is also available. In Java, MySQL can be used transparently with the JDO standard.

## FEATURES

Two main engines are present in MySQL: MyISAM and InnoDB. MyISAM, unlike InnoDB, does not support transactions or automatic table integrity, it is not intended for applications where data consistency is critical; however, its performance makes it suitable for applications requiring a simple and inexpensive database to implement.

For users, phpMyAdmin is a web tool often available to create, populate and use MySQL databases.

## ADVANTAGES

Fast MySQL server is very fast. Performance tests are available on the MySQL website Easy to use MySQL is much easier to use than most commercial database servers. Various APIs You can perform various operations on a MySQL database using interfaces written in C, Perl, C ++, Java, Python, PHP. Cost Until version 3.20.32a, mySQL was under the GPL license. You need a license to run mySQL on Windows. On other platforms, using mySQL is free for non-commercial purposes, otherwise a license will have to be purchased for around US.

## DISADVANTAGES

MySQL cannot handle the following: Subselect. Nested queries are not supported by MySQL. You must therefore translate your nested queries into classic queries. If you have difficulties, a good solution is to save the values of the sub-queries in a temporary table, and to access this temporary table from the main query. An example of a query that MySQL doesn't support:

```
SELECT deptno, ename, sal FROM emp x WHERE sal > (SELECT  
AVG (sal) FROM emp WHERE x.deptno = deptno) ORDER BY
```

deptno; Transactions and commit / rollback. A transaction is a logical unit of work that contains one or more SQL blocks executed by a user. A transaction ends when it is explicitly stopped by the user. In classic SQL, a transaction begins with a COMMIT and ends with a ROLLBACK. MySQL does not support transactions.

However, we can simulate transactions using

`LOCK TABLES` and `UNLOCK TABLES`. *Foreign keys and referential integrity.*

Stored procedures. Triggers. Views.



## SPECIFICATIONS

PostgreSQL is a relational and object database management system (RDBMS). It is a free tool available under the terms of a BSD-type license. This RDBMS uses modern types of data, known as composed or enriched according to the terminologies used in the usual computer term. This means that PostgreSQL can store more data types than the traditional simple types integers, characters, etc. User can create types, functions, use type inheritance, etc. PostgreSQL works on Solaris, SunOS, Mac OS X, HP-UX, AIX, Linux, IRIX, Digital Unix, BSD, NetBSD, FreeBSD, OpenBSD, SCO unix, NeXTSTEP, UnixWare and all kinds of Unix. Since version 8.0, PostgreSQL also works natively on Windows. Prior to version 8, a POSIX compatibility layer (eg cygwin) was required to run PostgreSQL on this operating system. PostgreSQL is widely recognized for its stable behavior, similar to Oracle, but also for its extended programming possibilities, directly in the database engine, via PL / pgSQL. Internal data processing can also be coupled with other external modules compiled in other languages.

## ADVANTAGES

For me its extensibility is definitely its biggest advantage. PostgreSQL has a number of features, which form a complete and consistent foundation for most uses. However, it is possible to extend its functionality. Want to access another SQL or NoSQL server? adding a connect in PostgreSQL takes five minutes. Do you want to add a scheduler or a statistics historization tool? no worries, you add it in ten minutes. Do you want to integrate a new stored procedure language (Perl for example)? in two minutes you have it. Do you need a specific data type, or a full spatial layer for PostgreSQL? that's ten minutes. PostgreSQL doesn't do everything, but it easily adapts to your needs and business context. This is a major advantage

## DISADVANTAGES

In terms of functionality, the lack of parallelization for the execution of a query is a fairly significant brake. Partitioning is very basic. Physical replication is reaching its limits. Fortunately, logical replication is being implemented.

## SQL SERVER

Microsoft SQL Server is a database management system (DBMS) in SQL language incorporating, among other things, an RDBMS (relational DBMS ") developed and marketed by the Microsoft company. It works on Windows and Linux OS (since March 2016), but it is possible to launch it on Mac OS via Docker, because there is a download version on the Microsoft website<sup>2</sup>.

## ADVANTAGES

SQL Server Management Studio to easily manage databases  
(creation of tables, queries, etc.) integration with other Microsoft  
products very good performance in general under Windows  
extensive security options data compression and backups Free  
Express version

## DISADVANTAGES

not suitable for a small database on your PC (prefer MS Access or FileMaker for example) versions strongly related to Windows  
versions jungle of versions (editions, components, processors,

# Bibliography

Wikipedia

Thank You for Your Attention!