***MySQL :***

It is the world’s most commonly used RDBMS, written in C and C++.

It works on many different system platforms, including Linux, Mac OS X, Solaris, etc.

Some programming languages include libraries for accessing MySQL databases. These include MySQL Connector/Net for integration with Microsoft’s Visual Studio and JDBC driver for Java

MySQL Workbench allows the users to manage the following:

- Database design & modeling

- SQL Development

- Database Administration

MYSQL has proven itself to be fast, reliable and cost effective to other competitors such as MS SQL Server and Oracle

It is free and developers can amend its code to suit their requirements, which makes MYSQL highly customizable.

New modules are constantly being developed for integration with MYSQL. This presents a wider and faster circle of patches, upgrades and fixes available.

MySQL supports the capacity to handle deeply embedded application running massive data and holding terabytes of information.

Its flexibility: compatible with Windows, Linux, OS2 and Solaris. It also includes APIs for integration with C, C++, PHP, Java, Perl, Python, Tcl, Ruby, etc.

Its performance: A unique storage-engine architecture allows server configuration according to the application type - whether high-speed transactional processing system or high-volume web site servicing millions of queries a day.

***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.

PostgreSQL comes with [many features](https://www.postgresql.org/about/featurematrix/) aimed to help developers build applications, administrators to protect data integrity and build fault-tolerant environments, and help you manage your data no matter how big or small the dataset. In addition to being [free and open source](https://www.postgresql.org/about/license/), PostgreSQL is highly extensible. For example, you can define your own data types, build out custom functions, even write code from [different programming languages](https://www.postgresql.org/docs/current/xplang.html) without recompiling your database!

PostgreSQL server is [process](https://en.wikipedia.org/wiki/Process_(computing))-based (not threaded), and uses one operating system process per database session. Multiple sessions are automatically spread across all available CPUs by the operating system. Starting with PostgreSQL 9.6, many types of queries can also be parallelized across multiple background worker processes, taking advantage of multiple CPUs or cores. Client applications can use threads and create multiple database connections from each thread.

***SQL SERVER :***

SQL Server is a relational database management system, or RDBMS, developed and marketed by Microsoft.

Similar to other RDBMS software, SQL Server is built on top of SQL, a standard programming language for interacting with the relational databases. SQL server is tied to Transact-SQL, or T-SQL, the Microsoft’s implementation of SQL that adds a set of proprietary programming constructs.

SQL Server works exclusively on Windows environment for more than 20 years. In 2016, Microsoft made it available on Linux. SQL Server 2017 became generally available in October 2016 that ran on both Windows and Linux.

* SQL Server consists of two main components: Database Engine and SQLOS

The core component of the SQL Server is the Database Engine. The Database Engine consists of a relational engine that processes queries and a storage engine that manages database files, pages, pages, index, etc. The database objects such as stored procedures, views, and triggers are also created and executed by the Database Engine.

The Relational Engine contains the components that determine the best way to execute a query. The relational engine is also known as the query processor.

The relational engine requests data from the storage engine based on the input query and processed the results.

Some tasks of the relational engine include querying processing, memory management, thread and task management, buffer management, and distributed query processing.

\*The storage engine is in charge of storage and retrieval of data from the storage systems such as disks and SAN.

Microsoft provides both data management and business intelligence (BI) tools and services together with SQL Server:

* For data management, SQL Server includes SQL Server Integration Services (SSIS), SQL Server Data Quality Services, and SQL Server Master Data Services. To develop databases, SQL Server provides SQL Server Data tools; and to manage, deploy, and monitor databases SQL Server has SQL Server Management Studio (SSMS).
* For data analysis, SQL Server offers SQL Server Analysis Services (SSAS). SQL Server Reporting Services (SSRS) provides reports and visualization of data. The Machine Learning Services technology appeared first in SQL Server 2016 which was renamed from the R Services.

Difference between them:

* PostgreSQL vs. MySQL is an important decision when it comes to choosing an open-source relational database management system. Both PostgreSQL and MySQL are time-proven solutions that can compete with enterprise solutions such as Oracle and SQL Server.
* MySQL has been famous for its ease of use and speed, while PostgreSQL has many more advanced features, which is the reason that PostgreSQL is often described as an open-source version of Oracle.
* The following table compares the features of these three RDBMS:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Editorial information provided by DB-Engines** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Name | **Microsoft SQL Server**[**X**](https://db-engines.com/en/system/MySQL%3BPostgreSQL) | **MySQL**[**X**](https://db-engines.com/en/system/Microsoft+SQL+Server%3BPostgreSQL) | **PostgreSQL**[**X**](https://db-engines.com/en/system/Microsoft+SQL+Server%3BMySQL) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Description | Microsofts relational DBMS | Widely used open source [RDBMS](https://db-engines.com/en/article/RDBMS) | Widely used open source [RDBMS](https://db-engines.com/en/article/RDBMS) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Primary database model | [Relational HYPERLINK "https://db-engines.com/en/article/RDBMS" DBMS](https://db-engines.com/en/article/RDBMS) | [Relational HYPERLINK "https://db-engines.com/en/article/RDBMS" DBMS](https://db-engines.com/en/article/RDBMS) | [Relational HYPERLINK "https://db-engines.com/en/article/RDBMS" DBMS](https://db-engines.com/en/article/RDBMS) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Secondary database models | [Document store](https://db-engines.com/en/article/Document+Stores) [Graph DBMS](https://db-engines.com/en/article/Graph+DBMS) | [Document store](https://db-engines.com/en/article/Document+Stores) | [Document store](https://db-engines.com/en/article/Document+Stores) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| |  |  | | --- | --- | | [DB- HYPERLINK "https://db-engines.com/en/ranking"Engines HYPERLINK "https://db-engines.com/en/ranking" HYPERLINK "https://db-engines.com/en/ranking"Ranking](https://db-engines.com/en/ranking) |  | | [Trend Chart](https://db-engines.com/en/ranking_trend/system/Microsoft+SQL+Server%3BMySQL%3BPostgreSQL) | | |  |  |  | | --- | --- | --- | | Score | 1043.12 | | | Rank | #3 | Overall | |  | #3 | Relational DBMS | | |  |  |  | | --- | --- | --- | | Score | 1256.38 | | | Rank | #2 | Overall | |  | #2 | Relational DBMS | | |  |  |  | | --- | --- | --- | | Score | 542.40 | | | Rank | #4 | Overall | |  | #4 | Relational DBMS | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Website | [www.microsoft.com/ HYPERLINK "https://www.microsoft.com/en-us/sql-server/"en-us/ HYPERLINK "https://www.microsoft.com/en-us/sql-server/"sql-server](https://www.microsoft.com/en-us/sql-server/) | [www.mysql.com](https://www.mysql.com/) | [www.postgresql.org](https://www.postgresql.org/) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Technical documentation | [docs.microsoft.com/ HYPERLINK "https://docs.microsoft.com/en-US/sql/sql-server/"en-US/ HYPERLINK "https://docs.microsoft.com/en-US/sql/sql-server/"sql HYPERLINK "https://docs.microsoft.com/en-US/sql/sql-server/"/ HYPERLINK "https://docs.microsoft.com/en-US/sql/sql-server/"sql HYPERLINK "https://docs.microsoft.com/en-US/sql/sql-server/"-server](https://docs.microsoft.com/en-US/sql/sql-server/) | [dev.mysql.com/ HYPERLINK "https://dev.mysql.com/doc/"doc](https://dev.mysql.com/doc/) | [www.postgresql.org/ HYPERLINK "https://www.postgresql.org/docs/manuals/"docs/ HYPERLINK "https://www.postgresql.org/docs/manuals/"manuals](https://www.postgresql.org/docs/manuals/) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Developer | Microsoft | Oracle | PostgreSQL Global Development Group |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Initial release | 1989 | 1995 | 1989 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Current release | SQL Server 2019, November 2019 | 8.0.21, 2020 | 13.0, September 2020 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| License | commercial | Open Source | Open Source |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Cloud-based only | no | no | no |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DBaaS offerings (sponsored links) |  | * [Azure Database for MySQL](https://azure.microsoft.com/en-us/services/mysql/): A fully managed, scalable MySQL relational database with high availability and security built in at no extra cost * [ScaleGrid HYPERLINK "https://t.sidekickopen79.com/s1t/c/5/f18dQhb0SdYj8bGch0W2n0x6l2B9nMJW7t69v68pTbB4W63Bc1d16gGCMf3DJp1901?te=W3R5hFj4cm2zwW4cHbrv3K4dNZW3GGZrk1LBf35F47PNcYS6TW1&si=370885007&pi=a68632e2-e84c-4cff-8541-4a0fd2702aba" for MySQL](https://t.sidekickopen79.com/s1t/c/5/f18dQhb0SdYj8bGch0W2n0x6l2B9nMJW7t69v68pTbB4W63Bc1d16gGCMf3DJp1901?te=W3R5hFj4cm2zwW4cHbrv3K4dNZW3GGZrk1LBf35F47PNcYS6TW1&si=370885007&pi=a68632e2-e84c-4cff-8541-4a0fd2702aba): Fully managed MySQL hosting on AWS, Azure and DigitalOcean with high availability and SSH access on the #1 multi-cloud DBaaS. | * [Azure Database for PostgreSQL](https://azure.microsoft.com/en-us/services/postgresql/): A fully managed, scalable PostgreSQL relational database with high availability and security built in at no extra cost * [ScaleGrid HYPERLINK "https://t.sidekickopen79.com/s1t/c/5/f18dQhb0SdYj8bGch0W2n0x6l2B9nMJW7t69v68pTbB4W63Bc1d16gGCMf3DJp1901?te=W3R5hFj4cm2zwW4cHbrv3K4dNZW3GGZrk1LCtCBW4fHrkG4cP21jf3R5h1204&si=370885007&pi=a68632e2-e84c-4cff-8541-4a0fd2702aba" for PostgreSQL](https://t.sidekickopen79.com/s1t/c/5/f18dQhb0SdYj8bGch0W2n0x6l2B9nMJW7t69v68pTbB4W63Bc1d16gGCMf3DJp1901?te=W3R5hFj4cm2zwW4cHbrv3K4dNZW3GGZrk1LCtCBW4fHrkG4cP21jf3R5h1204&si=370885007&pi=a68632e2-e84c-4cff-8541-4a0fd2702aba): Fully managed PostgreSQL hosting on AWS, Azure and DigitalOcean with high availability and SSH access on the #1 multi-cloud DBaaS. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Implementation language | C++ | C and C++ | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Server operating systems | Linux Windows | FreeBSD Linux OS X Solaris Windows | FreeBSD HP-UX Linux NetBSD OpenBSD OS X Solaris Unix Windows |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data scheme | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Typing | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| XML support | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Secondary indexes | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SQL | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| APIs and other access methods | ADO.NET JDBC ODBC OLE DB Tabular Data Stream (TDS) | ADO.NET JDBC ODBC Proprietary native API | ADO.NET JDBC native C library ODBC streaming API for large objects |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Supported programming languages | C# C++ Delphi Go Java JavaScript (Node.js) PHP Python R Ruby Visual Basic | Ada C C# C++ D Delphi Eiffel Erlang Haskell Java JavaScript (Node.js) Objective-C OCaml Perl PHP Python Ruby Scheme Tcl | .Net C C++ Delphi Java  JavaScript (Node.js) Perl PHP Python Tcl |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Server-side scripts | Transact SQL, .NET languages, R, Python and (with SQL Server 2019) Java | yes | user defined functions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Triggers | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Partitioning methods | tables can be distributed across several files (horizontal partitioning); sharding through federation | horizontal partitioning, sharding with MySQL Cluster or MySQL Fabric | partitioning by range, list and (since PostgreSQL 11) by hash |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replication methods | yes, but depending on the SQL-Server Edition | Multi-source replication Source-replica replication | Source-replica replication |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MapReduce | no | no | no |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Consistency concepts | Immediate Consistency | Immediate Consistency | Immediate Consistency |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Foreign keys | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Transaction concepts | ACID | ACID | ACID |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Concurrency | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Durability | yes | yes | yes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| In-memory capabilities | yes | yes | no |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| User concepts | fine grained access rights according to SQL-standard | Users with fine-grained authorization concept | fine grained access rights according to SQL-standard |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |