## ****DBMS LAB WORK:****

### What Is a Database?

* A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a [database management system (DBMS)](https://www.oracle.com/in/database/what-is-database/#WhatIsDBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system, often shortened to just database.
* Data within the most common types of databases in operation today is typically modeled in rows and columns in a series of tables to make processing and data querying efficient. The data can then be easily accessed, managed, modified, updated, controlled, and organized. Most databases use structured query language (SQL) for writing and querying data.

## ****What is a Database Management System (DBMS)?****

* A database management system (DBMS) is software that stores and manages data. The database management system (DBMS) was first established in the 1960s to store any type of data. It also allows for data modification such as insertion, deletion, and updating.
* The DBMS system also manages the database by defining, generating, modifying, and regulating it. It’s built to develop and preserve data while also allowing each business application to retrieve the information it needs.

## ****What is a Relational Database Management System (RDBMS)?****

* RDBMS stands for Relational Database Management System and is a more sophisticated version of a database management system. It was established in the 1970s. In addition, an RDBMS system allows an organisation to access data more quickly than a DBMS system.
* RDBMS stands for Relational Database Management System, and it is a software system that is used to store only data in the form of tables. Data is handled and stored in rows and columns, which are referred to as tuples and attributes, in this type of system. RDBMS (Relational Database Management System) is a strong data management system that is extensively used across the world.

# Difference Between DBMS and RDBMS

| **DBMS** | **RDBMS** |
| --- | --- |
| [DBMS](https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/) stores data as file. | [RDBMS](https://www.geeksforgeeks.org/rdbms-architecture/) stores data in tabular form. |
| Data elements need to access individually. | Multiple data elements can be accessed at the same time. |
| No relationship between data. | Data is stored in the form of tables which are related to each other. |
| Normalization is not present. | Normalization is present. |
| DBMS does not support distributed database. | RDBMS supports distributed database. |
| It stores data in either a navigational or hierarchical form. | It uses a tabular structure where the headers are the column names, and the rows contain corresponding values. |
| It deals with small quantity of data. | It deals with large amount of data. |
| Data redundancy is common in this model. | Keys and indexes do not allow Data redundancy. |
| It is used for small organization and deal with small data. | It is used to handle large amount of data. |
| Not all Codd rules are satisfied. | All 12 Codd rules are satisfied. |
| Security is less | More security measures provided. |
| It supports single user. | It supports multiple users. |
| Data fetching is slower for the large amount of data. | Data fetching is fast because of relational approach. |
| The data in a DBMS is subject to low security levels with regards to data manipulation. | There exists multiple levels of data security in a RDBMS. |
| Low software and hardware necessities. | Higher software and hardware necessities. |
| Examples:[XML](https://www.geeksforgeeks.org/xml-basics/), Window Registry, Forxpro, dbaseIIIplus etc. | Examples: [MySQL](https://www.geeksforgeeks.org/architecture-of-mysql/), [PostgreSQL](https://www.geeksforgeeks.org/what-is-postgresql-introduction/), [SQL](https://www.geeksforgeeks.org/what-is-sql/) Server, Oracle, Microsoft Access etc. |

Popular database management Systems:

### MySQL

* [MySQL](https://www.mysql.com/) is a free, open source relational database management system (RDBMS). It was initially owned by MySQL AB, before being acquired by Sun Microsystems (part of Oracle Corporation since 2010). MySQL was originally developed by Ulf Michael Widenius, Swedes David Axmark and Allan Larsson, founders of MySQL AB.
* Many database-driven web applications, such as WordPress, Joomla and phpBB, as well as many popular websites like MediaWiki, Twitter and Facebook, use MySQL.
* **Developer**: Oracle Corporation.
* **Original author**: MySQL AB.
* **Latest MySQL release**: MySQL 8.0.32.
* **MySQL license**: GNU General Public License version 2 and proprietary.

### MariaDB:

* [MariaDB](https://mariadb.com/) is a community-developed, free and open source relational database management system. It is a fork of MySQL. MariaDB was originally developed by Ulf Michael Widenius, Swedes David Axmark and Allan Larsson, founders of MySQL AB and the MariaDB Foundation. Ulf Michael Widenius is the current lead developer and CTO of MariaDB.
* MariaDB is also included in numerous Linux distributions, such as CentOS, Debian and RHEL. Besides, it is used by many organizations such as Wikipedia, Google or Tumblr.
* **Developer**: MariaDB Corporation Ab and MariaDB Foundation.
* **Latest MariaDB release**: MariaDB 11.1.0.
* **MariaDB license**: GPL version 2.

### Microsoft SQL Server:

* [Microsoft SQL Server](https://www.microsoft.com/en-us/sql-server) is a commercial relational database management system. It is available in multiple editions, divided into three main categories: mainstream, specialized and discontinued editions.
* **Developer**: Microsoft.
* **Latest Microsoft SQL Server release**: Microsoft SQL Server 2022.
* **Microsoft SQL Server license**: proprietary license.

### Oracle DBMS:

* [Oracle DBMS](https://www.oracle.com/database/technologies/) is a commercial, multi-model database management system. It is also known as Oracle Database or just Oracle. It is commonly used for running: online transaction processing (OLTP) and data warehousing (DW).
* **Developer**: Oracle Corporation.
* **Latest Oracle DBMS long-term release**: Oracle DBMS 19c.
* **Latest Oracle DBMS release**: Oracle DBMS 23c beta.
* **Oracle DBMS license**: proprietary license.

