**ACROPOLIS INSTITUTE OF TECHNOLOGYAND RESEARCH INDORE (MP)**

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**Subject – Database Management System (DBMS)**

**(CY-405)**

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| **Sr. No.** | **Experiment** | **Date of Exp.** | **Date of sub.** | **Grade** |
| 1. | To study DBMS and RDBMS, its characteristic comparisons and study of popular DB software. | 11/03/24 | 18/03/24 |  |
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## ****INTRODUCTION TO DATABSE****

## ****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. |

**STUDY OF LATEST SOFTWARE OF DBMS**

### 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.

### PostgreSQL

[PostgreSQL](https://www.postgresql.org/) is a free, open source relational database management system (RDBMS). It was initially developed as a successor of the Ingres database, developed at the University of California, Berkeley.

**Developer**: PostgreSQL Global Development Group.

**Latest PostgreSQL release**: PostgreSQL 15.2.

**PostgreSQL license**: PostgreSQL license.

### MongoDB

[MongoDB](https://www.mongodb.com/) is an open source, [NoSQL](https://www.stackscale.com/blog/nosql-databases/), document-oriented database management system. MongoDB Inc. offers an integrated suite of cloud database services, as well as commercial support. This document-oriented database software is commonly used for high-volume data storage.

**Developer**: MongoDB Inc.

**Latest MongoDB release**: MongoDB 6.0.4.

**MongoDB license**: Server Side Public License (SSPL).

### Redis

[Redis](https://redis.io/), short for “Remote Dictionary Server”, is an open source, NoSQL, key-value database management system.

**Developer**: Redis.

**Original author**: Salvatore Sanfilippo.

**Latest Redis release**: Redis 7.0.

**Redis license**: BSD 3-clause.

### IBM DB2

[IBM DB2](https://www.ibm.com/products/db2) is a database management product developed by IBM, formerly known as DB2 for Linux, UNIX and Windows.

**Developer**: IBM.

**Latest IBM DB2 release**: IBM DB2 11.5.8.

**IBM DB2 license**: proprietary license.

### Elasticsearch

[Elasticsearch](https://www.elastic.co/elasticsearch/) is a distributed, RESTful search and analytics engine. It is based on the Lucene library. Elasticsearch is the successor to a previous search engine called Compass, also designed by Shay Banon.

**Developer**: Elastic NV.

**Original author**: Shay Banon.

**Latest Elasticsearch release**: Elasticsearch 8.7.

**Elasticsearch license**: dual-licensed Elastic license and Server Side Public License.

### SQLite

[SQLite](https://sqlite.org/index.html) is a public domain database engine that belongs to the embedded, relational database management systems family. It has bindings to many [programming languages](https://www.stackscale.com/blog/most-popular-programming-languages/).

**Developer**: Dwayne Richard Hipp.

**Latest SQLite release**: SQLite 3.41.2.

**SQLite license**: Public domain.