Experiment 01 – Case Study

Learning Objective: To study about open source and commercial relational database management system.

Tools: Microsoft Word, Powerpoint

Theory: Study about open source and commercial relational database management system.

- **Open Source**:

1. MySQL

Introduction:

MySQL is a relational database management system and known for its versatility and universal use. It is a open source and free to use, making it accessible for everyone. It is ideal for both small and large applications. MySQL adheres to the ANSI SQL standard, which promotes consistency in database operations. Initially released in 1995, MySQL has since been developed, distributed, and supported by Oracle Corporation. Interestingly, its name originates from the daughter of co-founder Monty Widenius.

Features:

1. Free to use.
2. Easy to use.
3. It is secure.
4. It follows the working of a client/server architecture.
5. It is versatile
6. It is scalable.
7. It is very fast.

Advantages:

1. It has good performance.
2. It is open source.
3. Easy installation.
4. Platform independency.
5. Large community for support.
6. Backup and Recovery.
7. Cost-effective Maintenance.

Disadvantages:

1. Limited scalability.
2. potential security vulnerabilities.
3. Not as high-profile as Oracle or DB2.
4. Limited support for complex queries.
5. Stability issues.
6. Poor performance in high loads
7. Debugging Challenges.

2. PostgreSQL:

Introduction:

PostgreSQL is a free open-source database system that supports both relational (SQL) and non-relational (JSON) queries. PostgreSQL is a back-end database for dynamic websites and web applications. PostgreSQL was invented at the Berkeley Computer Science Department, University of California. It started as a project in 1986 with the goal of creating a database system with the minimal features needed to support multiple data types.

Features:

1. It is free and open-source software.
2. Recovery is high.
3. It has user-defined data types.
4. It has the capacity for fault tolerance.
5. It has high availability.
6. It supports locking mechanisms.
7. It has Table inheritance.

Advantages:

1. It can run dynamic websites and web apps.
2. It is a highly fault-tolerant database.
3. It can be used as a geospatial data store
4. PostgreSQL source code is freely available under an open source license.
5. It is easy to use.
6. Low maintenance.
7. It supports geographic objects

Disadvantages:

1. It is slower than MySQL.
2. It is not owned by one organization.
3. It doesn't support many open sources like SQL.
4. Changes made for speed improvement requires more work than MySQL.
5. Needs more skilled professionals.
6. Installation is challenging.
7. less popular than other DBMS.

- **Commercial Source:**

1. Oracle:

Introduction:

It was created in 1977 by Lawrence Ellison and other engineers. It is one of the most popular relational database engines in the IT market for storing, organizing, and retrieving data. Oracle database was the first DB that designed for enterprise grid computing and data warehousing. Enterprise grid computing provides the most flexible and cost-effective way to manage information and applications. It uses SQL queries as a language for interacting with the database.

Features:

1. Availability
2. Performance and Scalability
3. Security
4. Backup and Recovery
5. Turning and Monitoring
6. Installing and Configuring
7. Database Design

Advantages:

1. Portability
2. Backup and Recovery
3. Transaction Support
4. Multiple Database Support
5. Market Presence
6. Version Changes
7. Relational Database

Disadvantages:

1. Complexity
2. Cost of Oracle Database
3. Difficult to Manage
4. Performance Issues
5. Not free to use
6. Requires Extensive Expertise
7. Scalability Limitations

2. Microsoft SQL:

Introduction:

Microsoft SQL Server is a relational database management system (RDBMS) that supports a wide variety of transaction processing, business intelligence (BI) and data analytics applications in corporate IT environments. Like other RDBMS software, Microsoft SQL Server is built on top of Structured Query Language (SQL), a standardized programming language that database administrators (DBAs) and other IT professionals use to manage databases and query the data they contain. Applications and tools connect to a SQL Server instance or database, and communicate using Transact-SQL (T-SQL).

Features:

1. Data warehousing
2. Query Store
3. Flexibility
4. Intelligent database capabilities
5. Data encryption and compliance
6. Big Data clusters
7. Data encryption and compliance

Advantages:

1. Various Editions
2. Microsoft Premier Support
3. Product Documentation
4. SQL Server Tools and Applications
5. Cloud Database Support
6. Support for use on Linux
7. Data Recover Support

Disadvantages:

1. Expensive Pricing
2. Complicated Licensing
3. Restricted Compatibility
4. Hardware Restrictions
5. Complex Administrations
6. Limited OS Support
7. Not good for Smaller Businesses

Learning Outcomes: The student should have the ability to

LO1: **understand** the various types of databases.

Course Outcomes: Upon completion of the course students will be able to understand the types of databases in detail.

Result and Discussion: The aim of this study was to explore open-source commercial relational database management system. Open-source databases are software with freely accessible source code, while closed-source databases are proprietary software with restricted source code access.

Conclusion:……
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For Faculty Use

Correction Parameters	**Formative Assessment [40%]**	Timely completion of Practical [40%]	**Attendance / Learning Attitude [20%]**	
Marks Obtained				