

Module – 7

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).
- 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 a database.

MYSQL

- MySQL is a relational database management system (RDBMS) based on the SQL (Structured Query Language) queries.
- It is one of the most popular languages for accessing and managing the records in the table. MySQL is open-source and free software under the GNU license.
- Oracle Company supports it.
- The following are the most important features of MySQL:
 - Relational Database Management System MySQL is a relational database management system.
 - This database language is based on the SQL queries to access and manage the records of the table.
- Easy to use
MySQL is easy to use. We have to get only the basic knowledge of SQL. We can build and interact with MySQL by using only a few simple SQL statements.
- It is secure
MySQL consists of a solid data security layer that protects sensitive data from intruders. Also, passwords are encrypted in MySQL.
- Client/ Server Architecture
MySQL follows the working of a client/server architecture. There is a database server and arbitrarily many clients, which communicate with the server; that is, they can query data, save changes, etc.
- Free to download
MySQL is free to use so that we can download it from MySQL official website without any cost.

- **Speed**
MySQL is considered one of the very fast database languages, backed by a large number of the benchmark test
- **High Flexibility**
MySQL supports a large number of embedded applications, which makes MySQL very flexible.
- **High Performance**
MySQL is faster, more reliable, and cheaper because of its unique storage engine architecture. It provides very high-performance results in comparison to other databases without losing an essential functionality of the software. It has fast loading utilities because of the different cache memory.
- **Memory efficiency**
Its efficiency is high because it has a very low memory leakage problem.
- **High Productivity**
MySQL uses Triggers, Stored procedures, and views that allow the developer to give higher productivity.
- **Partitioning**
This feature improves the performance and provides fast management of the large database.
- **Platform Independent**
It can download, install, and execute on most of the available operating systems.

Workbench Overview

- MySQL Workbench is a unified visual database designing or graphical user interface tool used for working with database architects, developers, and Database Administrators. It is developed and maintained by Oracle.
- MySQL Workbench covers five main functionalities, which are given below:
 - **SQL Development:**
 - This functionality provides the capability that enables you to execute SQL queries, create and manage connections to the database Servers with the help of built-in SQL editor.
- **Server Administration:** This functionality enables you to administer MySQL Server instances by administering users, inspecting audit data, viewing database health, performing backup and recovery, and monitoring the performance of MySQL Server.
- **Data Migration:** This functionality allows you to migrate from Microsoft SQL Server, SQLite, Microsoft Access, PostgreSQL, Sybase ASE, SQL Anywhere, and other RDBMS

tables, objects, and data to MySQL. It also supports migrating from the previous versions of MySQL to the latest releases.

- **MySQL Enterprise Supports:** This functionality gives the support for Enterprise products such as MySQL firewall, MySQL Enterprise Backup, and MySQL Audit.
- **MySQL Workbench Administration Tool**
 - The Administration Tool plays an important role in securing the data of the company. Here, we are going to discuss the user's management, Server configuration, Database backup and restorations, Server logs, and many more.
 - **User Administration**
 - It is a visual utility that allows for managing the user that relate to an active MySQL Server instance. Here, you can add and manage user accounts, grant and drop privileges, view user-profiles, and expire passwords.
 - **Server Configuration**
 - It allows for advanced configuration of the Server. It provides detailed information about the Server and status variable, a number of threads, buffer allocation size, fine-tuning for optimal performance, and many more.
 - **Database backup and restorations**
 - It is a visual tool, which is used for importing/exporting MySQL dump files. The dump files contain SQL scripts for creating databases, tables, views, and stored procedures.
 - **Performance Dashboard**
 - This tab provides the statistical view of the Server performance. You can open it by navigating to the Navigation tab, and under the Performance section, choose Dashboard.
 - **Server Logs**
 - It displays log information for the MySQL Server by each connection tab. For each connection tab, it includes an additional tab for the general error logs.

CRUD Operation

- Create
 - Syntax for table creation:
 - CREATE TABLE TableName (ColumnName1 Datatype, ColumnName 2 Datatype,, ColumnName N Datatype);
 - Syntax for insertion of data in table:
 - INSERT INTO TableName (ColumnName 1 ,,, ColumnName N) VALUE S (Value 1,....,Value N),,,,,, (Value 1,....,Value N);
- Read
 - Syntax to fetch all the records:
 - SELECT *FROM TableName;
 - Syntax to fetch records according to the condition:
 - SELECT *FROM TableName WHERE CONDITION;
- Update
 - Syntax:
 - UPDATE Table_Name SET ColumnName = Value WHERE CONDITION;
- Delete
 - Syntax to delete all the records:
 - DELETE FROM TableName;
 - Syntax to delete records according to the condition:
 - DELETE FROM TableName WHERE CONDITION;