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 (RDBMS)**
  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 (MySQL) and arbitrarily many clients (application programs), 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.

- **It is scalable**

MySQL supports multi-threading that makes it easily scalable. It can handle almost any amount of data, up to as much as 50 million rows or more. The default file size limit is about 4 GB. However, we can increase this number to a theoretical limit of 8 TB of data.

- **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.

- **Compatible on many operating systems**
  MySQL is compatible to run on many operating systems, like Novell NetWare, Windows* Linux*, many varieties of UNIX* (such as Sun* Solaris*, AIX, and DEC* UNIX), OS/2, FreeBSD*, and others. MySQL also provides a facility that the clients can run on the same computer as the server or on another computer (communication via a local network or the Internet).

- **Allows roll-back**
  MySQL allows transactions to be rolled back, commit, and crash recovery.

- **Memory efficiency**
  Its efficiency is high because it has a very low memory leakage problem.

- **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.

- **High Productivity**
  MySQL uses Triggers, Stored procedures, and views that allow the developer to give higher productivity.

- **Platform Independent**
  It can download, install, and execute on most of the available operating systems.

- **Partitioning**
  This feature improves the performance and provides fast management of the large database.

- **GUI Support**
  MySQL provides a unified visual database graphical user interface tool named "**MySQL Workbench**" to work with database architects, developers, and Database Administrators.

- provides SQL development, data modeling, data migration, and comprehensive administration tools for server configuration, user administration, backup, and many more. MySQL has a fully GUI supports from MySQL Server version 5.6 and higher.

- **Dual Password Support**
  MySQL version 8.0 provides support for dual passwords: one is the current password, and another is a secondary password, which allows us to transition to the new password.

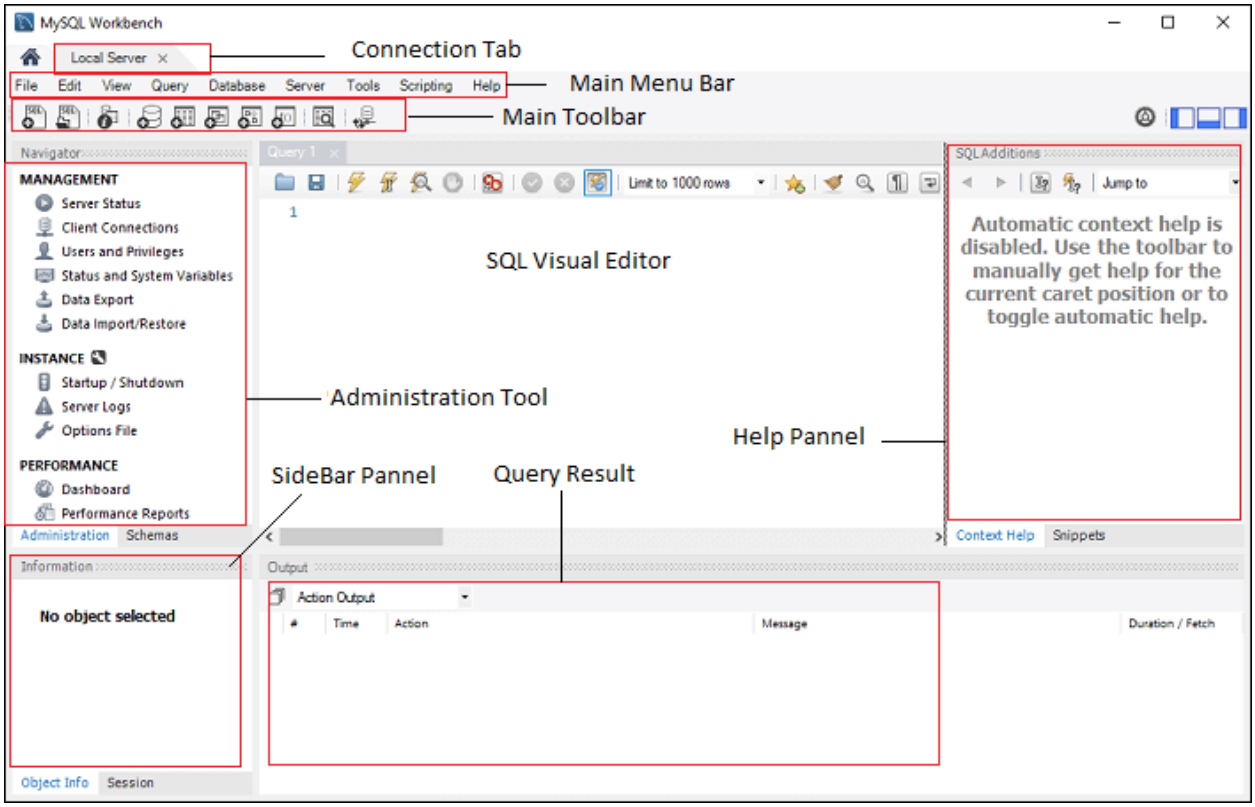
Workbanch Overview

- 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.
- **Data Modelling (Design):** This functionality provides the capability that enables you to create models of the database Schema graphically, performs

reverse and forward engineering between a Schema and a live database, and edit all aspects of the database using the comprehensive Table editor. The Table editor gives the facilities for editing tables, columns, indexes, views, triggers, partitioning, etc.

- **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.
    - **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.
    - **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.

CRUD Operation

- **Create**
  - **Syntax for table creation:**
  - CREATE TABLE Table_Name (ColumnName1 Datatype, ColumnName 2 Datatype,..., ColumnNameN Datatype);
  - **Syntax for insertion of data in table:**
  - INSERT INTO Table_Name (ColumnName1,...., ColumnNameN) 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;