

Lab #1 : Introduction to MySQL, its datatypes and its installation

1. Objective

- Understand the basic concepts and purpose of Relational Database Management Systems (RDBMS).
- Install and configure MySQL Server and MySQL Workbench.
- Identify and use different MySQL data types.
- Create databases and tables using SQL commands.

2. Required Software and Tools

| | |
|--|------------------------------------|
| MySQL Community Server | Version 8.0 or higher |
| MySQL Workbench (or XAMPP, phpMyAdmin) | GUI client for database management |

3. Background Theory

3.1 What is an RDBMS?

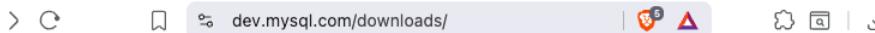
A Relational Database Management System (RDBMS) stores data in tables (rows and columns) and allows data manipulation using SQL. Examples: MySQL, PostgreSQL, Oracle, MS SQL Server.

3.2 Introduction to MySQL

MySQL is an open-source RDBMS developed by Oracle Corporation. It uses SQL for data access and follows a client-server architecture where MySQL Server manages databases and MySQL Workbench acts as a GUI client.

4. Installation Steps (MySQL Server and Workbench)

1. Download MySQL Installer from <https://dev.mysql.com/downloads/> and then install.



④ MySQL Community Downloads

- MySQL Yum Repository
- MySQL APT Repository
- MySQL SUSE Repository
- MySQL Community Server
- MySQL NDB Cluster
- MySQL Router
- MySQL Shell
- MySQL Operator
- MySQL NDB Operator
- MySQL Workbench
- MySQL Installer for Windows
- C API (libmysqlclient)
- Connector/C++
- Connector/J
- Connector/NET
- Connector/Node.js
- Connector/ODBC
- Connector/Python
- MySQL Native Driver for PHP
- MySQL Benchmark Tool
- Time zone description tables
- Download Archives

**MySQL Enterprise Edition
for Developers**

Free for learning, developing, and prototyping.

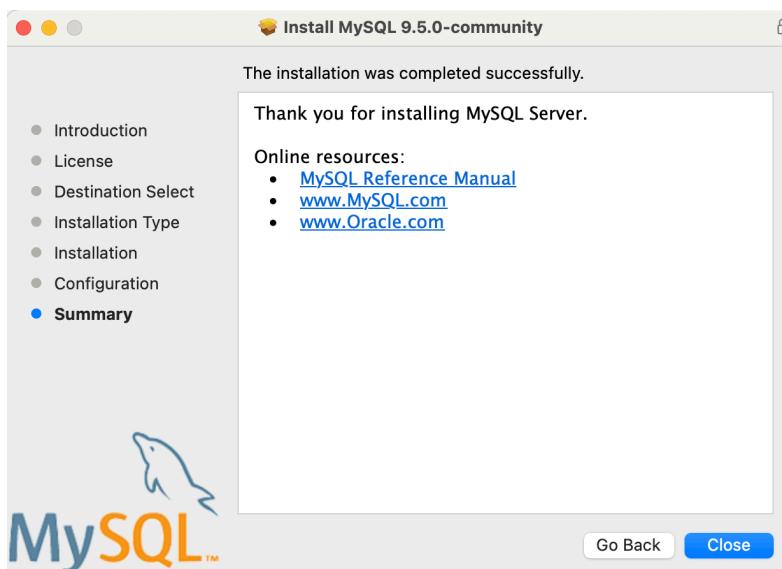


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Note your password while installing MySQL (e.g root123!)



5. MySQL Data Types

| Category | Data Type | Example | Description |
|-------------|-------------------------------|---------------------------------------|---------------------------------|
| Numeric | INT, BIGINT, SMALLINT | 10 | Whole numbers |
| Decimal | DECIMAL(p,s), NUMERIC(p,s) | 15.75 | Fixed precision decimal |
| Floating | FLOAT, DOUBLE | 12.567 | Approximate numeric values |
| String | CHAR(n), VARCHAR(n) | 'Pokhara' | Fixed/variable-length string |
| Text | TEXT, LONGTEXT | Essay text | Long text strings |
| Date & Time | DATE, TIME, DATETIME | '2025-11-09' '2025-11-09 11:22:33' | Date/time values |
| Boolean | BOOLEAN, BIT | 1 / 0 | True/False |
| Binary | BLOB | image data | Binary large objects |

6. Lab Exercises

6.1 Start and login Server

Start /Stop the MySQL server(MacOS)

```
sudo /usr/local/mysql/support-files/mysql.server start
sudo /usr/local/mysql/support-files/mysql.server stop
```

Setup PATH

Edit shell configuration file: nano ~/.zshrc

Add this line: export PATH=/usr/local/mysql/bin:\$PATH

Save and reload: source ~/.zshrc

Login to MySQL

```
mysql -u root -p
```

6.2 Run MySQL queries

- Create a Database

```
CREATE DATABASE collegeDB;
USE collegeDB;
```

- Create a Table

```
CREATE TABLE students (
    StusentID INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(50) NOT NULL,
    age INT,
    dob DATE,
```

```
        address VARCHAR(100)
) ;
```

- Insert Records

```
INSERT INTO students (name, age, dob, address)
VALUES ('Bidur Devkota', 21, '2004-05-14', 'Pokhara');
(insert your own name here)
```

- Display Records

```
SELECT * FROM students;
```

- Describe Table

```
DESCRIBE students;
```

- Create Table class with name, class_roll_num, enrollment_year and insert your own data.

7. Observation Table

| Command Executed | Description | Output Screenshot | Remarks |
|------------------|-------------|-------------------|---------|
| | | | |
| | | | |

8. Result

- MySQL and MySQL Workbench successfully installed.
- Database and tables created.
- Basic SQL commands executed successfully.
- MySQL data types understood and tested.

9. Conclusion

In this lab, we learned about the MySQL RDBMS environment, its installation, and data types. We created databases and tables, inserted records, and retrieved data using SQL commands.