



MYSQL BASICS

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Study Guide

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Introduction to MySQL

MySQL is one of the most popular relational database management systems used in software development and web applications. It is widely used along with PHP for building dynamic websites and enterprise applications.

MySQL stores data in the form of tables that contain rows and columns. It helps developers organize, manage, retrieve, and update data efficiently.

MySQL was originally developed by MySQL AB and is now owned by Oracle Corporation. Many popular websites and applications use MySQL because it is reliable, fast, and easy to learn.

MySQL is commonly used in admin portals, e-commerce systems, ERP applications, school management systems, inventory software, and APIs.

Features of MySQL

MySQL provides many useful features for developers and database administrators.

1. Open Source: MySQL Community Edition is freely available for learning and development.
2. High Performance: MySQL can process large amounts of data efficiently.
3. Security: It supports user authentication and access control.
4. Scalability: Applications can grow from small projects to enterprise systems.
5. Cross Platform: MySQL works on Windows, Linux, and macOS.
6. Easy Integration: It can be connected with PHP, Python, Java, C#, and many other programming languages.

Installing MySQL

MySQL can be installed using packages such as XAMPP, WAMP, or standalone MySQL Server.

XAMPP is commonly used for beginners because it includes Apache, PHP, and MySQL together.

After installation, MySQL services can be managed using phpMyAdmin or MySQL Workbench.

The default MySQL server usually runs on port 3306.

Understanding Databases

A database is a collection of related information stored electronically.

In MySQL, data is stored inside tables. Each table contains rows and columns.

For example, a Student table may contain StudentID, Name, Email, and Course columns.

Databases help avoid duplicate data and improve data management.

Creating Databases and Tables

Before storing data, a database must be created.

Inside the database, tables are created to store different types of information.

Each table should have a proper structure with meaningful column names.

```
CREATE DATABASE academy;
```

```
USE academy;
```

```
CREATE TABLE students(  
    student_id INT,  
    student_name VARCHAR(100),  
    course_name VARCHAR(100)  
);
```

Data Types in MySQL

Data types define the kind of values that can be stored in a column.

INT is used for whole numbers.

VARCHAR is used for storing text values.

DATE stores date values.

FLOAT and DECIMAL are used for numeric values with decimal points.

Choosing the correct data type improves performance and storage efficiency.

Insert, Update and Delete

INSERT is used to add new records into a table.

UPDATE modifies existing records.

DELETE removes records from a table.

These are important SQL operations used in daily application development.

```
INSERT INTO students(student_id, student_name, course_name)
VALUES (1, 'Arun', 'PHP');
```

```
UPDATE students
SET course_name='MySQL'
WHERE student_id=1;
```

```
DELETE FROM students
WHERE student_id=1;
```

SELECT Queries

The SELECT statement is used to retrieve data from a table.

It is one of the most frequently used SQL commands.

Developers use SELECT queries to display data in websites, reports, and dashboards.

```
SELECT * FROM students;
```

```
SELECT student_name, course_name
FROM students;
```

WHERE Clause

The WHERE clause is used to filter records based on conditions.

It helps retrieve only the required data instead of all records.

Conditions can be based on numbers, text, dates, or combinations.

```
SELECT * FROM students
WHERE course_name='PHP';
```

ORDER BY and LIMIT

ORDER BY is used to sort records in ascending or descending order.

LIMIT restricts the number of rows returned by a query.

These are commonly used in reports and pagination.

```
SELECT * FROM students
ORDER BY student_name ASC
LIMIT 5;
```

Primary Key and Auto Increment

A Primary Key uniquely identifies each row in a table.

AUTO_INCREMENT automatically generates sequential values.

Primary keys are important for maintaining data integrity.

```
CREATE TABLE employees (
    employee_id INT AUTO_INCREMENT PRIMARY KEY,
    employee_name VARCHAR(100)
);
```

Joins in MySQL

Joins are used to combine data from multiple tables.

INNER JOIN returns matching records from both tables.

LEFT JOIN returns all records from the left table and matching records from the right table.

Joins are essential for relational database systems.

```
SELECT students.student_name, courses.course_name
FROM students
INNER JOIN courses
ON students.course_id = courses.course_id;
```

Connecting MySQL with PHP

PHP applications commonly connect with MySQL databases to store and retrieve information.

The `mysqli_connect()` function is used to establish database connectivity.

After connection, queries can be executed from PHP code.

```
<?php

$conn = mysqli_connect("localhost","root","","academy");

if($conn){
    echo "Database Connected";
}

?>
```

Example Programs

The following query displays all students from the students table.

```
SELECT * FROM students;
```

Summary

MySQL is a powerful and beginner-friendly relational database management system.

It is widely used in web applications, enterprise systems, and APIs.

Understanding SQL queries, tables, relationships, and database concepts is essential for backend development.

Learning MySQL together with PHP provides a strong foundation for full-stack web development.