

Database Management Systems Final Project Requirements

You are required to design and implement a **data-driven application** that integrates a **MySQL database** with a **front-end interface** (can be web-based or desktop-based) to simulate a real-world system. The primary focus must be on **effective use of SQL** as taught throughout the course.

Core Project Requirements

Your project must include the following:

1. SQL Database Design & Integration

- Use MySQL as the backend database.
- Include at least 5 interrelated tables with proper normalization.
- Demonstrate:
 - Primary keys, Foreign keys
 - Appropriate data types
 - Constraints (e.g., NOT NULL, UNIQUE, DEFAULT, CHECK)

2. Front-End Interface (Any technology: PHP, HTML/CSS, JS etc.)

- Must have forms/pages to:
 - **Add, edit, and delete records.**
 - **View/search/filter results.**
- Front-end should be connected to the database via SQL queries.
- Web or Desktop GUI is acceptable (PHP, Java, Python Tkinter, etc.)

3. SQL Features Implementation

- **Basic Operations**
 - Creating tables
 - Inserting rows
 - Updating and deleting data
 - Retrieving data using SELECT with aliases and expressions
- **Query Features**
 - Use of WHERE, ORDER BY, LIMIT
 - Logical operators (AND, OR, NOT)
 - Pattern matching with LIKE
 - IS NULL, DISTINCT

- **Joins & Multi-table Queries**
 - Atleast:
 1. One INNER JOIN
 2. One LEFT JOIN or RIGHT JOIN
 3. One JOIN involving 3 or more tables
- **Group Functions & Aggregates**
 - Use of COUNT(), SUM(), AVG(), MIN(), MAX()
 - GROUP BY and HAVING clauses
- **Subqueries**
 - One single-row subquery
 - One multiple-row subquery with IN, ANY, or ALL
- **Views**
 - Create at least one VIEW to simplify data retrieval
- **User Access Control**
 - Create at least one custom user
 - Grant object-level privileges (e.g., SELECT, INSERT) using GRANT
 - Use WITH GRANT OPTION or PUBLIC as appropriate

Minimum Deliverables

1. **SQL Scripts** (.sql file(s) containing):
 - Table creation scripts, Data insertion, View creation & User and privilege creation
2. **Application Source Code**
 - Complete code with clear comments, showing how SQL queries are executed from the application
3. **Sample Database**
 - A `.sql` dump of your final database (with data)
4. **Screenshots**
 - GUI showcasing data insertion, search, display, updates
5. **Project Report**