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## **“Library Management Database System”**

Mini project report submitted in partial fulfillment of curriculum prescribed for the Database Management Systems (20CS510) course for the award of the degree of

**BACHELOR OF ENGINEERING  
IN  
COMPUTER SCIENCE AND ENGINEERING**

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## **CERTIFICATE**

This is to certify that the work entitled "**Library Management Database System**" is a bonafied work carried out **by Abhishek M.B, Anagha K.P, Sinchana S, and Kirtana Kiran** in partial fulfillment of the award of the degree of **Bachelor of Engineering in Computer Science and Engineering of JSS Science and Technology, Mysuru during the year 2023**. It is certified that all corrections / suggestions indicated during CIE have been incorporated in the report. The mini project report has been approved as it satisfies the academic requirements in respect of mini project work for event 1 prescribed for the Database Management Systems (20CS510) course.

Course in Charge and Guide

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# **1. INTRODUCTION**

## **1.1 Objectives of the library management system**

Library management system has a wider scope towards the educational institutions these days. In general, every educational institution right from a high school to Universities, maintain ample number of books, journals, articles, and different publications with them. Initially library management is done manually and the required records are saved across books. The common details that were maintained across libraries include the overall information of all kinds of books against different publications and also the details of the issues and refunds of the corresponding books. The manual approach followed initially is fine if the case is limited to few books and as the scope of library is improving these days, a perfect automated system is required in this context. There were many automated software's developed in this context and most of them are successful in maintain the library information as per the required standards of schools and universities as well. The main scope of the library management system mainly depends on few aspects like the number of publications and books maintained and the nature of the client like either it is targeted for universities, colleges or schools.

The overall objective is to have a Library Management System that can handle & manage the activities involved in a library in an efficient & reliable way. Easy searching availability & user profile managing are major goals in this project.

Specific objectives include:

- 1.To have a system that can replace the manual library management system.
- 2.To have a database that stores user and book details.
- 3.Give reliable search facility for the users.
- 4.The users have a separate login based on issue, borrow and reading purpose.
- 5.Create an easy-to-understand user friendly environment.
- 6.Attractive user interfaces to navigate through the system for the users.
- 7.Enable Online availability of books

The objective of the project Library Management System, which is used in the physical library is to monitor and control the transactions (Book Issue, Book return from the student, Stock Maintenance) in the library and to maintain the information of the books and customers.

## 1.2 Features of the Project

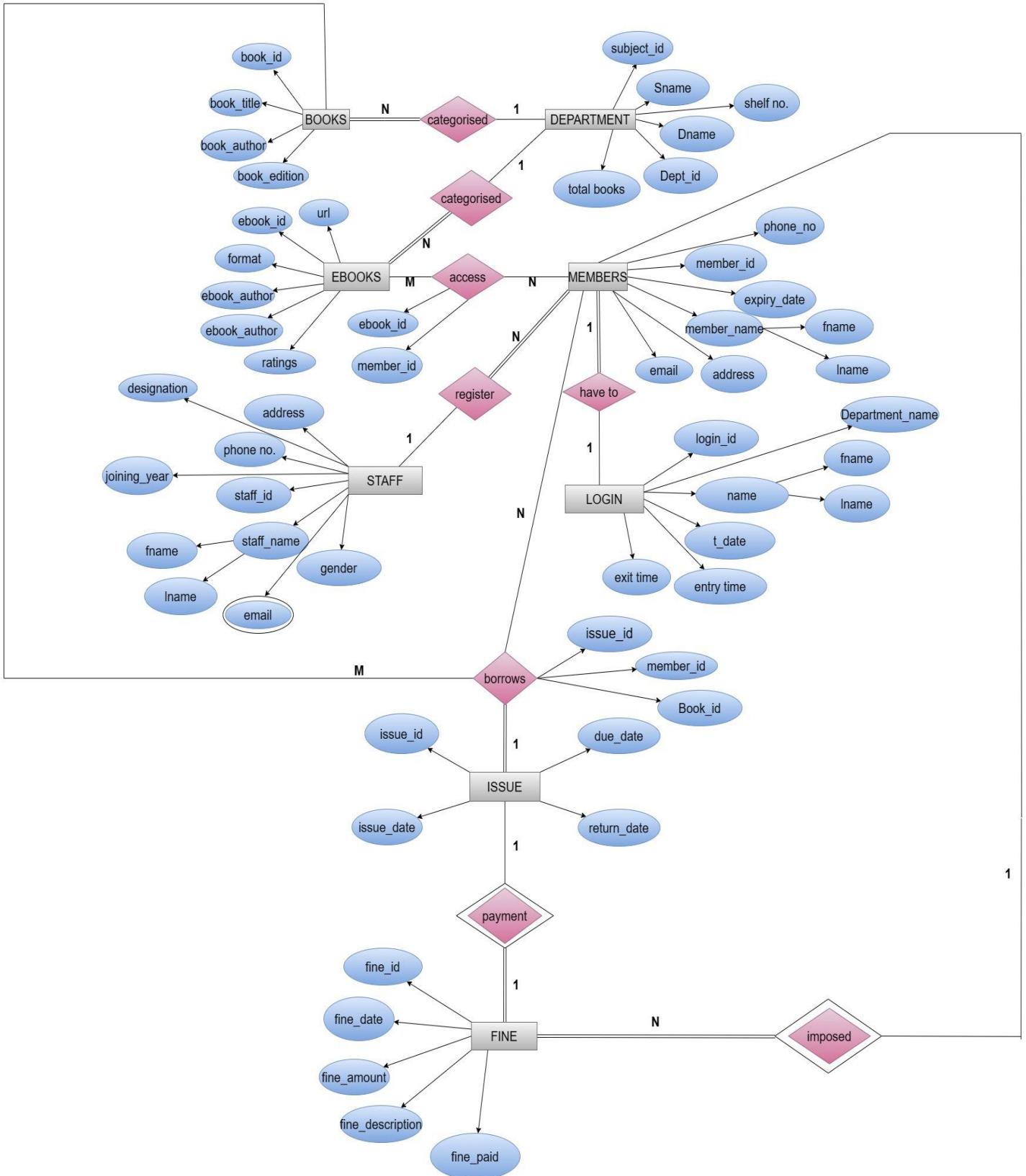
Our project Library Management System mainly emphasises on considering the database-related features such as:

1. Database Design: Creating a well-structured relational database schema to represent library data, including tables for books, patrons, transactions, and more.
2. Data Modelling: Defining data models for books, patrons, authors, publishers, fine transactions, and other relevant entities. Establish relationships between the entities such as a book being authored by one or more authors.
3. Data Entry and Editing: Develop forms and interfaces for librarians to input and edit data. Ensure data validation and integrity constraints are enforced at the database level.
4. Data Retrieval: Implementing SQL queries to retrieve data, such as searching for books, patrons, and transaction history. Enable advanced search options, including filtering by attributes like title, author, Id, and category.
5. User Accounts and Authentication: Store and manage user accounts, including login credentials and user roles. Implement authentication and authorization mechanisms to control access to system features.
6. Reporting and Analytics: Create SQL queries and reports to analyze library usage, track overdue items, and generate statistics. Store historical data for reporting purposes.
7. Inventory Management: Record details about books in the collection, such as title, author, ISBN, publication date, and condition. Implement features for adding, updating, and deleting items.
8. Digital Resource Management: Manage digital resources such as e-books and associate them with relevant records in the database. Ensure proper integration with digital content providers.
9. Scalability: Design the database to be scalable, allowing for the expansion of the library's collection and user base.
10. Data Integrity: Implement referential integrity constraints and ensure data consistency and accuracy.

In this project, the quality of the database design and implementation is critical to the overall functionality and performance of the Library Management System. It's important to ensure that the database schema is well-structured, efficient, and capable of handling the library's data management needs.

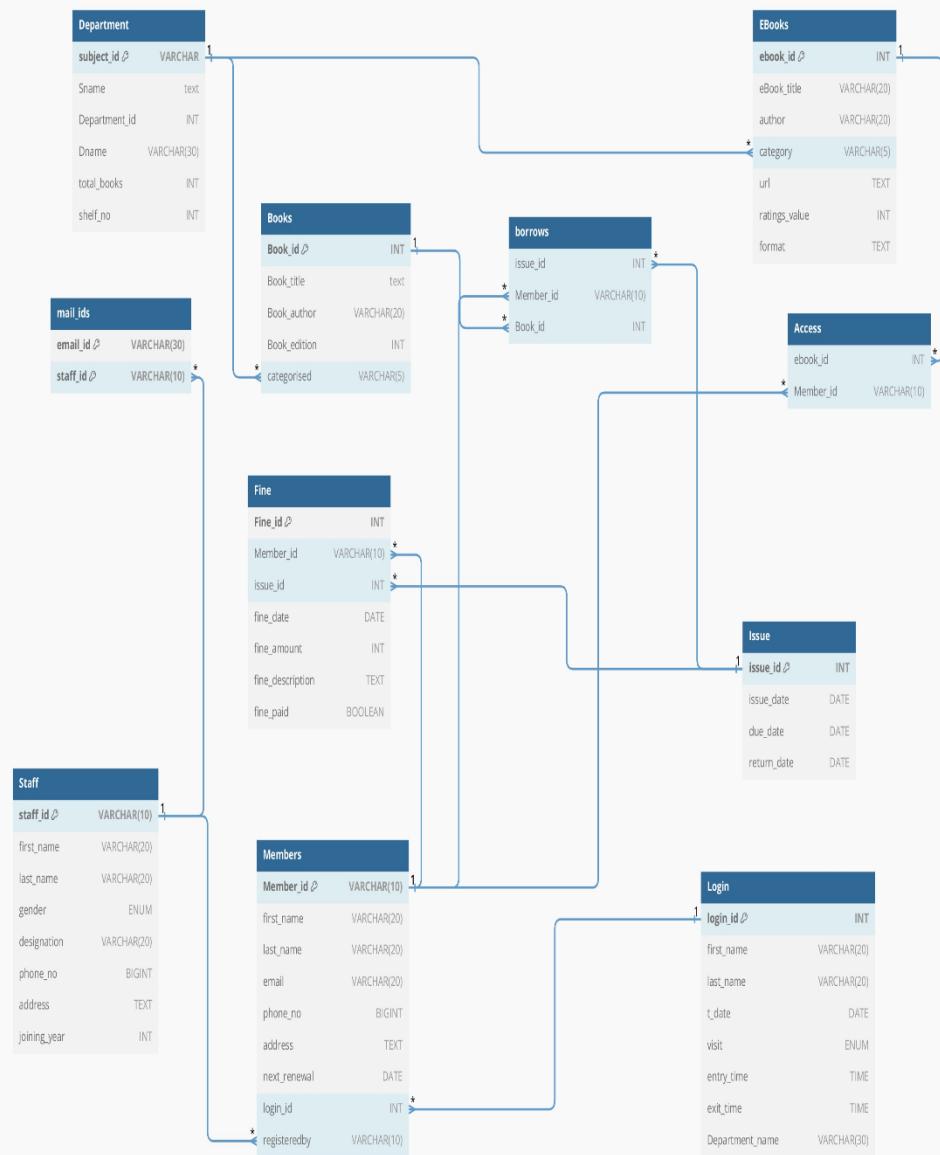
## 2. SYSTEM DESIGN

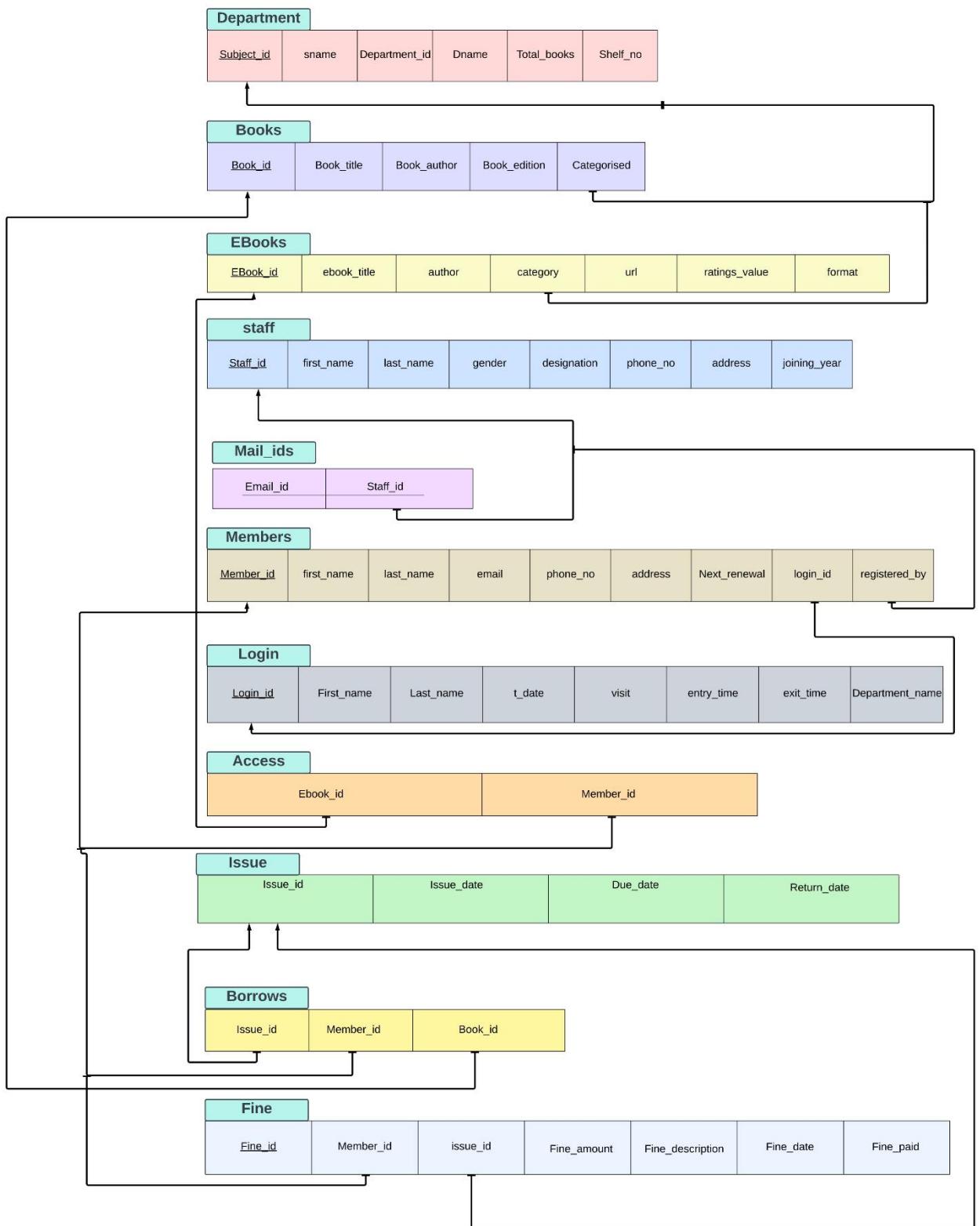
### 2.1ER Diagram-high level data modelling



## 2.2 SCHEMA DIAGRAM-CONCEPTUAL DATA MODELLING

A database schema is a structure that represents the logical storage of the data in a database. It represents the organization of data and provides information about the relationships between the tables in a given database. A schema diagram is a diagram which contains entities and the attributes that will define that schema. A schema diagram only shows us the database design. It does not show the actual data of the database.





## 2.3 STATE DIAGRAMS

A state diagram in a Database Management System (DBMS) is a graphical representation of the various states and transitions that a database object or system can undergo, illustrating its behavior in response to events or actions.

BOOKS TABLE:

mysql> select *from library_database.books;					
Book_id	Book_title	Book_author	Book_edition	categorised	
1	FUNDAMENTALS OF DATABASE SYSTEMS	Navathe	7	CS001	
2	BASIC MECHANICAL ENGINEERING	JK GUPTA	6	ME005	
3	ELECTRICAL ENGINEERING FUNDAMENTALS	Andrew S Tanenbaum	2	EE108	
4	THEORY OF COMPUTATION	Michael Sipser	2	CS112	
5	MACHINE LEARNING	Richard O Duda	2	CS009	
6	MECHATRONICS	W Bolton	5	ME101	
7	SIGNAL AND SYSTEMS	Alan V Oppenheim	4	EE112	
8	CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE	JK GUPTA	6	CV111	
9	ESTIMATING AND COSTING IN CIVIL ENGINEERING	B.N DUTTA	4	CV231	
10	INFORMATION TECHNOLOGY	SUMITA ARORA	3	IS109	
11	DESIGNING DATA-INTENSIVE APPLICATIONS	Martin Kleppmann	6	IS222	
12	POLYMER SCIENCE AND TECHNOLOGY	Anshu Srivastav	5	PS004	
13	POLYMERIZATION	Santosh K Gupta	4	PS013	
14	ELECTRONICS FUNDAMENTALS AND APPLICATIONS	D Chattopadhyay	3	EC118	
15	PRATICAL ELECTRONICS FOR INVENTORS	JB GUPTA	6	EC222	

EBOOKS TABLE:

mysql> select *from library_database.ebooks;						
ebook_id	eBook_title	author	category	url	ratings_value	format
1	FUNDAMENTALS OF DATABASE SYSTEMS	Navathe	CS001	http://127.0.1:db.html	5	PDF
2	BASIC MECHANICAL ENGINEERING	Abraham Silberschatz	ME005	https://www.academia.edu	4	PDF
3	ELECTRICAL ENGINEERING FUNDAMENTALS	Andrew S Tanenbaum	EE108	https://csc-knu.github.io	3	PDF
4	THEORY OF COMPUTATION	Michael Spiser	CS112	https://www.cin.ufpe.br	2	PDF
5	MACHINE LEARNING	Richard O Duda	CS009	https://dl.acm.org	5	PDF
6	SIGNAL AND SYSTEMS	Alan V Oppenheim	EE112	https://mrcet.com	4	PDF
7	CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE	JK GUPTA	CV111	https://easyengineering.net	3	PDF
8	MECHATRONICS	W Bolton	ME101	https://www.sze.hu	5	PDF
9	ESTIMATING AND COSTING IN CIVIL ENGINEERING	B.N DUTTA	CV231	https://sriet.ac.in	4	PDF
10	INFORMATION TECHNOLOGY	SUMITA ARORA	IS109	https://www.researchgate.net	2	PDF
11	DESIGNING DATA-INTENSIVE APPLICATIONS	Martin Kleppmann	IS222	https://www.academia.edu	5	PDF
12	POLYMER SCIENCE AND TECHNOLOGY	Anshu Srivastav	PS004	https://www.wng.edu	3	PDF
13	POLYMERIZATION	Santosh K Gupta	PS013	https://www.sathyabama.in	4	PDF
14	ELECTRONICS FUNDAMENTALS AND APPLICATIONS	D Chattopadhyay	EC118	https://www.ncert.in	5	PDF
15	PRATICAL ELECTRONICS FOR INVENTORS	JB GUPTA	EC222	https://archive.org	5	PDF

STAFF TABLE:

mysql> select *from library_database.staff;							
staff_id	first_name	last_name	gender	designation	phone_no	address	joining_year
LIBSL013	Nandini	S	Female	Systems_Librarian	9784316859	#24 kuvempunagar Mysore	2020
LIDCA011	Karthik	suresh	Male	Cataloger	8453127648	#23 Hebbal Mysore	2015
LIDCA012	Ravi	Kumar	Male	Cataloger	5481943784	#23 Vijayanagar Mysore	2020
LIDCC008	Kumara	S	Male	Circulation_Clerk	9116482847	#30 T K layout Mysore	2010
LIDCC009	Tarini	kumari	Female	Circulation_Clerk	9372626868	#56 Kuvempunagar Mysore	2011
LIDL007	Jeevith	Patel	Male	Library_Assistant	8242437485	#6 Siddhartha Nagar Mysore	2006
LIDL002	Kempanna	Gowda	Male	Librarian	4637284747	#25 Gangothri layout Mysore 570009	1995
LIDL004	Kumuda	R	Female	Librarian	8362829662	#13 Shaktinagar Mysore	1999
LIDRL010	Vachana	BV	Female	Reference_Librarian	9784643581	#34 Saraswathipuram Mysore	2015
LIDSS005	Devika	L	Female	Support_Staff	9835174628	#14 Vijayanagar Mysore	2002
LIDSS006	Mahadevi	M	Female	Support_Staff	9845273636	#34 Hebbal Mysuru	2006
LIDTE003	Susheela	S	Female	Library_Technician	9838261907	#12 Kuvempunagar Mysore	1996

TABLE MAIL\_IDs:

```
mysql> select *from library_database.mail_ids;
+-----+-----+
| email_id | staff_id |
+-----+-----+
| devika@gmail.com | LIDSS005 |
| jeevith@gmail.com | LIDL007 |
| jeevithpatel372@gmail.com | LIDL007 |
| karthik@gmail.com | LIDCA011 |
| kempanna@gmail.com | LIDL002 |
| kempannat561@gmail.com | LIDL002 |
| kumara@gmail.com | LIDCC008 |
| kumuda@gmail.com | LIDL004 |
| kumudaR51@gmail.com | LIDL004 |
| mahadevi@gmail.com | LIDSS006 |
| nandini@gmail.com | LIBSL013 |
| ravi@gmail.com | LIDCA012 |
| ravikumar461@gmail.com | LIDCA012 |
| sanjay@gmail.com | LIDTE001 |
| sanjaykumar21@gmail.com | LIDTE001 |
| susheela@gmail.com | LIDTE003 |
| tarini@gmail.com | LIDCC009 |
| tarinikumari@gmail.com | LIDCC009 |
| vachana@gmail.com | LIDRL010 |
+-----+
19 rows in set (0.00 sec)
```

TABLE LOGIN:

```
mysql> select *from library_database.login;
+-----+-----+-----+-----+-----+-----+-----+-----+
| login_id | first_name | last_name | t_date | visit | entry_time | exit_time | Department_name |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1 | Aniket | Shetty | 2023-10-23 | reading | 02:30:25 | 03:30:25 | CSE |
| 2 | Abhishek | MB | 2023-10-24 | borrow | 04:30:00 | 05:30:45 | ISE |
| 3 | Sinchana | S | 2023-10-24 | return | 04:30:01 | 05:15:46 | MECH |
| 4 | Anagha | KP | 2023-10-24 | reading | 04:30:30 | 05:22:12 | EEE |
| 5 | Kirtana | Kiran | 2023-10-24 | reading | 04:30:56 | 05:05:33 | CSE |
| 6 | John | Samuel | 2023-10-25 | borrow | 01:35:24 | 02:20:30 | IP |
| 7 | Jagruth | Kumar | 2023-10-25 | return | 03:38:48 | 04:20:55 | ENVI |
| 8 | Vivek | Patel | 2023-10-26 | borrow | 09:55:45 | 10:45:22 | CSE |
+-----+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```

## TABLE ISSUE:

```
mysql> select *from library_database.issue;
+-----+-----+-----+-----+
| issue_id | issue_date | due_date | return_date |
+-----+-----+-----+-----+
| 1000 | 2023-10-01 | 2023-10-16 | 2023-10-20 |
| 1001 | 2023-10-02 | 2023-10-17 | 2023-10-21 |
| 1002 | 2023-10-02 | 2023-10-17 | 2023-10-22 |
| 1003 | 2023-10-03 | 2023-10-18 | 2023-10-22 |
| 1004 | 2023-10-03 | 2023-10-18 | 2023-10-21 |
| 1005 | 2023-10-04 | 2023-10-19 | 2023-10-17 |
| 1006 | 2023-10-04 | 2023-10-19 | 2023-10-19 |
+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

## TABLE MEMBERS:

```
mysql> select *from library_database.members;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Member_id | first_name | last_name | email | phone_no | address | next_renewal | login_id |
| registeredby |
+-----+-----+-----+-----+-----+-----+-----+-----+
| STU001 | Abhishek | MB | mba@gmail.com | 8088868794 | #11 Nandini layout allnahalli Mysore 570002 | 2025-01-21 | 2 |
| LIDLI002 |           |   |           |           |           |           |           |
| STU002 | Anagha | KP | anagha@gmail.com | 1234567890 | #16,4th cross,Siddhartha layout,Mysuru | 2025-01-21 | 4 |
| LIDTE003 |           |   |           |           |           |           |           |
| STU003 | Sinchana | S | sinchana@gmail.com | 2345678127 | #20,3rd cross,gangotri layout | 2025-01-22 | 3 |
| LIDTE003 |           |   |           |           |           |           |           |
| STU004 | Kirtana | KIRAN | kirtana@gmail.com | 8893452134 | #21,4th cross,rajkamal apartment,Rajajinagar,Bangalore | 2025-01-22 | 5 |
| LIDLI002 |           |   |           |           |           |           |           |
| STU005 | Aniket | Shetty | aniket@gmail.com | 3412908765 | #20,5th cross,tk layout,rajajinagar,Mysuru | 2025-01-23 | 1 |
| LIDTE003 |           |   |           |           |           |           |           |
| STU006 | John | Samuel | akash@gmail.com | 1245716543 | #15,4th cross,Jayanagar,Bangalore | 2025-01-23 | 6 |
| LIDTE003 |           |   |           |           |           |           |           |
| STU009 | Jagruth | Kumar | jagruth@gmail.com | 2234567172 | #21,2nd cross,sidharthanagar mysuru | 2025-02-13 | 7 |
| LIDTE003 |           |   |           |           |           |           |           |
| STU010 | Vivek | Patel | vivek@gmail.com | 7865439087 | #56,7th cross,Hebbal,Mysuru | 2024-02-13 | 8 |
| LIDLI002 |           |   |           |           |           |           |           |
+-----+-----+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```

## TABLE FINE:

```
mysql> select *from library_database.fine;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Fine_id | Member_id | issue_id | fine_date | fine_amount | fine_description | fine_paid |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 500 | STU001 | 1000 | 2023-10-17 | 40 | Return delay | 1 |
| 501 | STU002 | 1001 | 2023-10-18 | 40 | Book damage | 0 |
| 502 | STU003 | 1002 | 2023-10-18 | 50 | Book damage | 1 |
| 503 | STU004 | 1003 | 2023-10-19 | 40 | Return delay | 0 |
| 504 | STU005 | 1004 | 2023-10-19 | 800 | Book lost | 0 |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

### TABLE BORROWS:

```
mysql> select * from library_database.borrows;
+-----+-----+-----+
| issue_id | Member_id | Book_id |
+-----+-----+-----+
| 1000 | STU002 | 5 |
| 1005 | STU003 | 7 |
| 1002 | STU004 | 3 |
| 1004 | STU005 | 11 |
| 1001 | STU001 | 6 |
+-----+-----+-----+
5 rows in set (0.00 sec)
```

### TABLE ACCESS:

```
mysql> select *from library_database.access;
+-----+-----+
| ebook_id | Member_id |
+-----+-----+
| 1 | STU001 |
| 5 | STU002 |
| 7 | STU003 |
| 3 | STU004 |
| 11 | STU005 |
+-----+-----+
5 rows in set (0.00 sec)
```

### TABLE DEPARTMENT:

```
mysql> SELECT *from library_database.Department;
+-----+-----+-----+-----+-----+
| subject_id | Sname | Department_id | Dname | total_books | shelf_no |
+-----+-----+-----+-----+-----+
| CS001 | DATABASE MANAGEMENT SYSTEMS | 1 | CSE | 1 | 1 |
| CS009 | MACHINE LEARNING | 1 | CSE | 1 | 3 |
| CS112 | THEORY OF COMPUTATION | 1 | CSE | 1 | 2 |
| CV111 | CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE | 4 | CIVIL | 1 | 8 |
| CV231 | ESTIMATING AND COSTING IN CIVIL ENGINEERING | 4 | CIVIL | 1 | 9 |
| EC118 | ELECTRONICS FUNDAMENTALS AND APPLICATIONS | 7 | ECE | 1 | 14 |
| EC222 | PRACTICAL ELECTRONICS FOR INVENTORS | 7 | ECE | 1 | 15 |
| EE108 | ELECTRICAL ENGINEERING FUNDAMENTALS | 3 | EEE | 1 | 6 |
| EE112 | SIGNAL AND SYSTEMS | 3 | EEE | 1 | 7 |
| IS109 | INFORMATION TECHNOLOGY | 5 | ISE | 1 | 10 |
| IS222 | DESIGNING DATA-INTENSIVE APPLICATIONS | 5 | ISE | 1 | 11 |
| ME005 | BASIC MECHANICAL ENGINEERING | 2 | ME | 1 | 4 |
| ME101 | MECHATRONICS | 2 | ME | 1 | 5 |
| PS004 | POLYMER SCIENCE AND TECHNOLOGY | 6 | PSE | 1 | 12 |
| PS013 | POLYMERIZATION | 6 | PSE | 1 | 13 |
+-----+-----+-----+-----+-----+
15 rows in set (0.00 sec)
```

### **3. SYSTEM IMPLEMENTATION**

#### **3.1 Introduction to DBMS and MySQL**

DBMS is a software application or a suite of software tools that enables organizations and individuals to efficiently manage and manipulate large volumes of structured data. It acts as an intermediary between users and the underlying database, offering a simplified and organized way to interact with data.

The key components of the DBMS are:

1. Data: The core component of any DBMS, it includes structured information that needs to be stored, organized, and managed.
2. Database: A structured collection of related data that is stored in a systematic manner for easy access and retrieval.
3. DBMS Software: The software that facilitates data storage, retrieval, manipulation, and management.
4. Users: Individuals or applications that interact with the DBMS to perform operations on the data.

The functions and features involved in DBMS are:

- Data Storage: DBMS provides a systematic way to store data, including tables, rows, and columns.
- Data Retrieval: Users can efficiently retrieve specific data from the database using queries.
- Data Manipulation: DBMS allows for inserting, updating, and deleting data, ensuring data accuracy and consistency.
- Data Security: DBMS offers various levels of access control and security to protect sensitive data.
- Data Integrity: It enforces data integrity rules to maintain the quality and reliability of data.
- Concurrency Control: DBMS manages concurrent access to data to avoid conflicts and maintain data consistency.
- Backup and Recovery: It provides tools for data backup and recovery in case of system failures or data corruption.
- Data Query Language: DBMS typically supports a query language (e.g., SQL - Structured Query Language) for interacting with the database.
- Indexing and Performance Optimization: DBMS employs indexing and other optimization techniques to improve query performance.

- Data Modeling: It allows users to define the structure and relationships within the data, ensuring data is organized logically.

The types of DBMS include:

1. Relational DBMS (RDBMS): Organizes data into structured tables with predefined schemas. Popular examples include MySQL, Oracle, and Microsoft SQL Server.
2. NoSQL DBMS: Designed for unstructured or semi-structured data and provides flexibility and scalability. Types include document-oriented (e.g., MongoDB), key-value stores (e.g., Redis), and column-family stores (e.g., Apache Cassandra).
3. Object-Oriented DBMS (OODBMS): Manages data as objects, making it suitable for object-oriented programming. Examples include db4o and Versant.
4. Graph DBMS: Designed to manage and query data with complex relationships, making them suitable for applications like social networks. Neo4j is a well-known example.

The importance of DBMS includes the following points:

1. Data Integrity: DBMS enforces data integrity constraints, ensuring the accuracy and reliability of data.
2. Data Security: It provides access control mechanisms, protecting sensitive data from unauthorized access.
3. Data Organization: Data is structured and organized, making it easier to manage and query.
4. Scalability: DBMS solutions can scale to accommodate increasing data volumes and user loads.
5. Data Recovery: Backup and recovery features safeguard data against loss or corruption.
6. Concurrent Access: DBMS handles multiple users and applications accessing data simultaneously without conflicts.

A Database Management System (DBMS) is a critical component of information management in the digital age. It simplifies data management, enhances data security, and allows for efficient data retrieval and manipulation. DBMS comes in various types to suit different data needs and is widely used across diverse industries, from finance and healthcare to e-commerce and education.

MySQL is a popular open-source Relational Database Management System (RDBMS) known for its robustness, speed, and ease of use. It has gained widespread popularity as a database solution and is utilized in a wide range of applications, from small websites to large-scale enterprise systems.

The key features of MySQL include:

- Relational Database: MySQL follows a relational database model, where data is organized into tables with predefined schemas, consisting of rows and columns.
- SQL (Structured Query Language): MySQL uses SQL, a standardized language for querying and manipulating data, making it easy for developers and administrators to interact with the database.
- Open Source: MySQL is an open-source database, which means it is freely available for use and modification. This has contributed to its widespread adoption and community support.
- Cross-Platform: MySQL is available for various operating systems, including Linux, Windows, macOS, and others, making it versatile and compatible with different environments.
- High Performance: MySQL is known for its speed and efficiency, making it suitable for applications with high data throughput and complex queries.
- Scalability: MySQL offers various tools and features to scale from small databases to large, distributed systems, making it a flexible choice for growing applications.
- Data Security: MySQL provides security features such as user authentication, access control, encryption, and auditing to protect sensitive data.
- Data Types: It supports various data types, including integers, strings, dates, and more, to accommodate a wide range of data requirements.
- ACID Compliance: MySQL adheres to the ACID (Atomicity, Consistency, Isolation, Durability) properties, ensuring data consistency and reliability.
- Storage Engines: MySQL supports multiple storage engines, including InnoDB (default), MyISAM, and others, each with its own strengths and features.

The Use Cases of MySQL are: MySQL is employed in a variety of applications and industries, including:

- Web Applications: Many websites and web applications use MySQL as their backend database for storing user data, content, and transactional information.
- Content Management Systems (CMS): Popular CMS platforms like WordPress, Joomla, and Drupal rely on MySQL databases to manage and retrieve content.
- E-commerce: E-commerce platforms use MySQL to handle product catalogs, customer orders, and transaction records.

- Business Systems: MySQL is used in various business applications, including customer relationship management (CRM), enterprise resource planning (ERP), and data warehousing.
- Data Analytics: MySQL can be part of data analytics and business intelligence systems for data storage and retrieval.
- Mobile Applications: MySQL can serve as a backend database for mobile apps, handling user profiles, in-app purchases, and other data.

The MySQL editions include:

- MySQL Community Edition: This is the free, open-source version of MySQL, suitable for smaller projects and development environments.
- MySQL Enterprise Edition: A commercial version that includes additional features, support, and tools for large-scale and mission-critical applications.

In conclusion, MySQL is a versatile and powerful RDBMS that has become a cornerstone of the modern web and software development. It offers robust features, ease of use, and a vibrant community, making it a top choice for developers and organizations looking for a reliable database management system.

### **3.2 Queries designed using SQL commands:**

#### **SIMPLE QUERIES:**

1. SELECT staff\_id FROM staff WHERE designation ='Systems\_Librarian';
2. insert into login values(9,'Aditya','verma','2023-10-28','reading','02:30:45','03:00:00','ISE');
3. insert into borrows values(1006,'STU001',15);
4. SELECT COUNT(\*) AS num\_users  
FROM Login  
WHERE t\_date = '2023-10-24';
5. SELECT COUNT(\*) AS num\_users  
FROM Login  
WHERE t\_date = '2023-10-27';

6.UPDATE Fine

```
set fine_paid = 1  
where Fine_id = 504;
```

7.SELECT SUM(fine\_amount) AS total\_fine\_amount  
FROM Fine;

8.DELETE FROM MEMBERS WHERE first\_name = "Vivek";

### **NESTED QUERIES:**

1.SELECT \*FROM Books  
WHERE Book\_id IN (SELECT Book\_id FROM Borrows WHERE Member\_id = 'STU001');

2.SELECT eBook\_title FROM Ebooks WHERE ratings\_value =  
(SELECT MAX(ratings\_value) FROM Ebooks);  
SELECT eBook\_title AS MAX\_rating  
FROM Ebooks  
WHERE ratings\_value = (SELECT MAX(ratings\_value) FROM Ebooks);

3. SELECT \*FROM Department  
WHERE subject\_id IN (SELECT DISTINCT categorised  
FROM Books INNER JOIN Department  
ON Books.categorised = Department.subject\_id);

4. SELECT first\_name,last\_name  
FROM Members  
WHERE member\_id IN(SELECT member\_id FROM Fine WHERE fine\_paid = True);

5.INSERT INTO borrows VALUES(1000,'STU006',5);  
SELECT first\_name,last\_name  
FROM Members  
WHERE member\_id IN(SELECT Member\_id FROM borrows WHERE book\_id = 5);

6.SELECT Books.Book\_title, Department.Dname  
FROM Books  
INNER JOIN Department ON Books.categorised = Department.subject\_id;

7.SELECT Members.first\_name, Members.last\_name, Fine.fine\_amount, Fine.fine\_description  
FROM Fine  
INNER JOIN Members ON Fine.Member\_id = Members.Member\_id  
WHERE Fine.fine\_paid = 0;

8.SELECT Members.first\_name, Members.last\_name, Books.Book\_title  
FROM Members  
LEFT JOIN Borrows ON Members.Member\_id = Borrows.Member\_id  
LEFT JOIN Books ON Borrows.Book\_id = Books.Book\_id;

### **SET OPERATIONS:**

1.SELECT author,eBook\_title  
FROM ebooks  
WHERE ratings\_value > 3  
UNION  
SELECT Book\_author, Book\_title  
FROM books;

2.SELECT Book\_title,Book\_edition  
FROM books  
WHERE categorised = 'CS001'  
UNION  
SELECT Sname , Dname  
FROM department  
WHERE total\_books ='10';

3.SELECT first\_name, last\_name  
FROM Staff  
WHERE staff\_id NOT IN (

```
SELECT registeredby  
FROM Members  
);
```

```
4.SELECT Book_title,Book_author  
FROM books  
WHERE Book_id NOT IN(  
SELECT Book_id FROM borrows);
```

#### **GROUP BY:**

```
1.SELECT visit,COUNT(*) AS number_of_visitors  
FROM Login  
GROUP BY visit;
```

```
2.SELECT visit,COUNT(*) AS number_of_visitors  
FROM Login  
GROUP BY visit  
ORDER BY number_of_visitors;
```

```
3. SELECT member_id,COUNT(*) AS no_of_books_taken  
FROM borrows  
GROUP BY member_id  
ORDER BY no_of_books_taken;
```

#### **HAVING BY:**

```
1.SELECT fine_description,SUM(fine_amount) AS total_amount  
FROM fine  
WHERE fine_date!='2023-10-19'  
GROUP BY fine_description  
HAVING SUM(fine_amount)>50  
ORDER BY total_amount DESC;
```

```
2.SELECT designation,COUNT(*) AS total_members  
FROM staff
```

GROUP BY designation

HAVING COUNT(\*)>1;

3.SELECT fine\_description,SUM(fine\_amount) AS total\_amount

FROM fine

WHERE fine\_date!='2023-10-17'

GROUP BY fine\_description

HAVING SUM(fine\_amount)>50

ORDER BY total\_amount DESC;

### PATTERN MATCHING:

1.SELECT first\_name,last\_name,designation AS staff\_who\_joined\_between\_1990\_and\_2010

FROM staff

WHERE joining\_year between 1990 and 2010;

2.SELECT \* FROM Login

WHERE DATE\_FORMAT(t\_date, '%Y-%m-%d') LIKE '2023-10%';

3.SELECT eBook\_id, eBook\_title

FROM EBooks

WHERE eBook\_title LIKE '%Database%';

4.SELECT \* FROM Login

WHERE DATE\_FORMAT(t\_date, '%Y-%m-%d') LIKE '2023-10-25';

## 4. SYSTEM TESTING AND RESULTS

### SIMPLE QUERIES:

1.

```
mysql> insert into login values(9,'Aditya','verma','2023-10-28','reading','02:30:45','03:00:00','ISE');
Query OK, 1 row affected (0.06 sec)
```

2.

```
Error: 1045 (42000): Unknown database 'library'
mysql> SELECT * from library_database.login;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| login_id | first_name | last_name | t_date | visit | entry_time | exit_time | Department_name |
+-----+-----+-----+-----+-----+-----+-----+-----+
|      1 | Aniket     | Shetty    | 2023-10-23 | reading | 02:30:25 | 03:30:25 | CSE
|      2 | Abhishek   | MB        | 2023-10-24 | borrow   | 04:30:00 | 05:30:45 | ISE
|      3 | Sinchana   | S         | 2023-10-24 | return   | 04:30:01 | 05:15:46 | MECH
|      4 | Anagha     | KP        | 2023-10-24 | reading   | 04:30:30 | 05:22:12 | EEE
|      5 | Kirtana    | Kiran    | 2023-10-24 | reading   | 04:30:56 | 05:05:33 | CSE
|      6 | John        | Samuel   | 2023-10-25 | borrow   | 01:35:24 | 02:20:30 | IP
|      7 | Jagruth    | Kumar    | 2023-10-25 | return   | 03:38:48 | 04:20:55 | ENVI
|      8 | Vivek      | Patel    | 2023-10-26 | borrow   | 09:55:45 | 10:45:22 | CSE
|      9 | Aditya     | verma    | 2023-10-28 | reading   | 02:30:45 | 03:00:00 | ISE
+-----+-----+-----+-----+-----+-----+-----+-----+
9 rows in set (0.00 sec)
```

3.

```
mysql> SELECT COUNT(*) AS num_users
      -> FROM Login
      -> WHERE t_date = '2023-10-27';
+-----+
| num_users |
+-----+
|          0 |
+-----+
1 row in set (0.01 sec)

mysql> SELECT COUNT(*) AS num_users
      -> FROM Login
      -> WHERE t_date = '2023-10-24';
+-----+
| num_users |
+-----+
|          4 |
+-----+
1 row in set (0.00 sec)
```

4.

```
mysql> UPDATE Fine
      -> set fine_paid = 1
      -> where Fine_id = 504;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * from library_database.fine;
+-----+-----+-----+-----+-----+-----+-----+-----+
| Fine_id | Member_id | issue_id | fine_date | fine_amount | fine_description | fine_paid |
+-----+-----+-----+-----+-----+-----+-----+-----+
|    500 | STU001   |    1000 | 2023-10-17 |       40 | Return delay   |      1 |
|    501 | STU002   |    1001 | 2023-10-18 |       40 | Book damage    |      0 |
|    502 | STU003   |    1002 | 2023-10-18 |       50 | Book damage    |      1 |
|    503 | STU004   |    1003 | 2023-10-19 |       40 | Return delay   |      0 |
|    504 | STU005   |    1004 | 2023-10-19 |     800 | Book lost      |      1 |
+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

5.

```
mysql> SELECT SUM(fine_amount) AS total_fine_amount
-> FROM Fine;
+-----+
| total_fine_amount |
+-----+
|          970 |
+-----+
1 row in set (0.00 sec)
```

6.

```
mysql> DELETE FROM MEMBERS WHERE first_name = "Vivek";
Query OK, 1 row affected (0.01 sec)

mysql> SELECT *from library_database.members;
+-----+-----+-----+-----+-----+-----+-----+
| Member_id | first_name | last_name | email           | phone_no | address          | next_renewal | login_id |
|-----+-----+-----+-----+-----+-----+-----+
| STU001    | Abhishek   | MB       | mba@gmail.com  | 8888868794 | #11 Nandini layout allnahalli Mysore 570002 | 2025-01-21 |     2 | |
| IDL002    |             |          |                |             |          |                |             |          |
| STU002    | Anagha      | KP       | anagha@gmail.com | 1234567890 | #16,4th cross,Siddhartha layout,Mysuru | 2025-01-21 |     4 |
| IDTE003   |             |          |                |             |          |                |             |          |
| STU003    | Sinchana    | S        | sinchana@gmail.com | 2345678127 | #20,3rd cross,gangotri layout          | 2025-01-22 |     3 |
| IDTE003   |             |          |                |             |          |                |             |          |
| STU004    | Kirtana     | KIRAN    | kirtana@gmail.com | 8893452134 | #21,4th cross,rajkamal apartment,Rajajinagar,Bangalore | 2025-01-22 |     5 |
| IDL002    |             |          |                |             |          |                |             |          |
| STU005    | Aniket      | Shetty    | aniket@gmail.com | 3412908765 | #20,5th cross,tk layout,rajajinagar,Mysuru | 2025-01-23 |     1 |
| IDTE003   |             |          |                |             |          |                |             |          |
| STU006    | John         | Samuel    | akash@gmail.com  | 1245716543 | #15,4th cross,Jayanagar,Bangalore          | 2025-01-23 |     6 |
| IDTE003   |             |          |                |             |          |                |             |          |
| STU009    | Jagruth     | Kumar     | jagruth@gmail.com | 2234567172 | #21,2nd cross,sidharthanagar mysuru | 2025-02-13 |     7 |
| IDTE003   |             |          |                |             |          |                |             |          |
+-----+-----+-----+-----+-----+-----+-----+
7 rows in set (0.00 sec)
```

7.

```
mysql> SELECT staff_id
-> FROM staff
-> WHERE designation = 'Systems_Librarian';
+-----+
| staff_id |
+-----+
| LIBSL013 |
+-----+
1 row in set (0.00 sec)
```

## NESTED QUERIES:

1.

```
mysql> SELECT Books.Book_title, Department.Dname
-> FROM Books
-> INNER JOIN Department ON Books.categorised = Department.subject_id;
+-----+-----+
| Book_title | Dname |
+-----+-----+
| FUNDAMENTALS OF DATABASE SYSTEMS | CSE |
| BASIC MECHANICAL ENGINEERING | ME |
| ELECTRICAL ENGINEERING FUNDAMENTALS | EEE |
| THEORY OF COMPUTATION | CSE |
| MACHINE LEARNING | CSE |
| MECHATRONICS | ME |
| SIGNAL AND SYSTEMS | EEE |
| CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE | CIVIL |
| ESTIMATING AND COSTING IN CIVIL ENGINEERING | CIVIL |
| INFORMATION TECHNOLOGY | ISE |
| DESIGNING DATA-INTENSIVE APPLICATIONS | ISE |
| POLYMER SCIENCE AND TECHNOLOGY | PSE |
| POLYMERIZATION | PSE |
| ELECTRONICS FUNDAMENTALS AND APPLICATIONS | ECE |
| PRATICAL ELECTRONICS FOR INVENTORS | ECE |
+-----+-----+
15 rows in set (0.00 sec)
```

2.

```
mysql> SELECT Members.first_name, Members.last_name, Fine.fine_amount, Fine.fine_description
-> FROM Fine
-> INNER JOIN Members ON Fine.Member_id = Members.Member_id
-> WHERE Fine.fine_paid = 0;
+-----+-----+-----+-----+
| first_name | last_name | fine_amount | fine_description |
+-----+-----+-----+-----+
| Anagha     | KP          |      40 | Book damage       |
| Kirtana    | KIRAN        |      40 | Return delay      |
| Aniket     | Shetty        |    800 | Book lost         |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

3.

```
mysql> insert into borrows values(1006,'STU001',15);
Query OK, 1 row affected (0.01 sec)

mysql> SELECT *
-> FROM Books
-> WHERE Book_id IN (SELECT Book_id FROM Borrows WHERE Member_id = 'STU001');
+-----+-----+-----+-----+
| Book_id | Book_title           | Book_author | Book_edition | categorised |
+-----+-----+-----+-----+
|   6    | MECHATRONICS         | W Bolton    |           5   | ME101       |
|  15    | PRATICAL ELECTRONICS | JB GUPTA    |           6   | EC222       |
+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

4.

```
mysql> SELECT Members.first_name, Members.last_name, Books.Book_title
-> FROM Members
-> LEFT JOIN Borrows ON Members.Member_id = Borrows.Member_id
-> LEFT JOIN Books ON Borrows.Book_id = Books.Book_id;
+-----+-----+
| first_name | last_name | Book_title
+-----+-----+
| Abhishek | MB | MECHATRONICS
| Abhishek | MB | PRATICAL ELECTRONICS FOR INVENTORS
| Anagha | KP | MACHINE LEARNING
| Sinchana | S | SIGNAL AND SYSTEMS
| Kirtana | KIRAN | ELECTRICAL ENGINEERING FUNDAMENTALS
| Aniket | Shetty | DESIGNING DATA-INTENSIVE APPLICATIONS
| John | Samuel | NULL
| Jagruth | Kumar | NULL
| Vivek | Patel | NULL
+-----+-----+
9 rows in set (0.00 sec)
```

5.

```
mysql> SELECT *
-> FROM Department
-> WHERE subject_id IN (
->     SELECT DISTINCT categorised
->     FROM Books INNER JOIN Department
->     ON Books.categorised = Department.subject_id
-> );
+-----+-----+-----+-----+-----+-----+
| subject_id | Sname | Department_id | Dname | total_books | shelf_no |
+-----+-----+-----+-----+-----+-----+
| CS001 | DATABASE MANAGEMENT SYSTEMS | 1 | CSE | 1 | 1 |
| CS009 | MACHINE LEARNING | 1 | CSE | 1 | 3 |
| CS112 | THEORY OF COMPUTATION | 1 | CSE | 1 | 2 |
| CV111 | CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE | 4 | CIVIL | 1 | 8 |
| CV231 | ESTIMATING AND COSTING IN CIVIL ENGINEERING | 4 | CIVIL | 1 | 9 |
| EC118 | ELECTRONICS FUNDAMENTALS AND APPLICATIONS | 7 | ECE | 1 | 14 |
| EC222 | PRACTICAL ELECTRONICS FOR INVENTORS | 7 | ECE | 1 | 15 |
| EE108 | ELECTRICAL ENGINEERING FUNDAMENTALS | 3 | EEE | 1 | 6 |
| EE112 | SIGNAL AND SYSTEMS | 3 | EEE | 1 | 7 |
| IS109 | INFORMATION TECHNOLOGY | 5 | ISE | 1 | 10 |
| IS222 | DESIGNING DATA-INTENSIVE APPLICATIONS | 5 | ISE | 1 | 11 |
| ME005 | BASIC MECHANICAL ENGINEERING | 2 | ME | 1 | 4 |
| ME101 | MECHATRONICS | 2 | ME | 1 | 5 |
| PS004 | POLYMER SCIENCE AND TECHNOLOGY | 6 | PSE | 1 | 12 |
| PS013 | POLYMERIZATION | 6 | PSE | 1 | 13 |
+-----+-----+-----+-----+-----+
15 rows in set (0.00 sec)
```

6.

```
mysql> SELECT eBook_title AS MAX_rating
-> FROM Ebooks
-> WHERE ratings_value = (SELECT MAX(ratings_value) FROM Ebooks);
+-----+
| MAX_rating
+-----+
| FUNDAMENTALS OF DATABASE SYSTEMS
| MACHINE LEARNING
| MECHATRONICS
| DESIGNING DATA-INTENSIVE APPLICATIONS
| ELECTRONICS FUNDAMENTALS AND APPLICATIONS
| PRACTICAL ELECTRONICS FOR INVENTORS
+-----+
6 rows in set (0.00 sec)
```

7.

```
mysql> SELECT first_name, last_name
      -> FROM Members
      -> WHERE member_id IN(SELECT member_id FROM Fine WHERE fine_paid = True);
+-----+-----+
| first_name | last_name |
+-----+-----+
| Abhishek   | MB
| Sinchana    | S
| Aniket     | Shetty
+-----+-----+
3 rows in set (0.00 sec)
```

8.

```
mysql> INSERT INTO borrows VALUES(1000,'STU006',5);
Query OK, 1 row affected (0.06 sec)

mysql> SELECT *FROM library_database.borrows;
+-----+-----+-----+
| issue_id | Member_id | Book_id |
+-----+-----+-----+
| 1000    | STU002    | 5
| 1005    | STU003    | 7
| 1002    | STU004    | 3
| 1004    | STU005    | 11
| 1001    | STU001    | 6
| 1006    | STU001    | 15
| 1003    | STU004    | 4
| 1000    | STU006    | 5
+-----+-----+-----+
8 rows in set (0.00 sec)
```

```
ERROR 1054 (42S22): Unknown column 'Book_id' in 'where clause'
mysql> SELECT first_name, last_name
      -> FROM Members
      -> WHERE Member_id IN(SELECT Member_id FROM borrows WHERE Book_id = 5);
+-----+-----+
| first_name | last_name |
+-----+-----+
| Anagha    | KP
| John      | Samuel
+-----+-----+
2 rows in set (0.00 sec)
```

## SET OPERATIONS:

1.

```
mysql> SELECT Book_title, Book_edition
      -> FROM books
      -> WHERE categorised = 'CS001'
      -> UNION
      -> SELECT Sname , Dname
      -> FROM department
      -> WHERE total_books ='10';
+-----+-----+
| Book_title          | Book_edition |
+-----+-----+
| FUNDAMENTALS OF DATABASE SYSTEMS | 7
+-----+-----+
1 row in set (0.00 sec)
```

2.

```
mysql> SELECT first_name, last_name
-> FROM Staff
-> WHERE staff_id NOT IN (
->     SELECT registeredby
->     FROM Members
-> );
+-----+-----+
| first_name | last_name |
+-----+-----+
| Nandini    | S
| Karthik   | suresh
| Ravi      | Kumar
| Kumara    | S
| Tarini    | kumari
| Jeevith   | Patel
| Kumuda    | R
| Vachana   | BV
| Devika    | L
| Mahadevi  | M
+-----+
10 rows in set (0.00 sec)
```

3.

```
mysql> SELECT Book_title,Book_author
-> FROM books
-> WHERE Book_id NOT IN(
-> SELECT Book_id FROM borrows);
+-----+-----+
| Book_title          | Book_author |
+-----+-----+
| FUNDAMENTALS OF DATABASE SYSTEMS | Navathe
| BASIC MECHANICAL ENGINEERING | JK GUPTA
| CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE | JK GUPTA
| ESTIMATING AND COSTING IN CIVIL ENGINEERING | B.N DUTTA
| INFORMATION TECHNOLOGY | SUMITA ARORA
| POLYMER SCIENCE AND TECHNOLOGY | Anshu Srivastav
| POLYMERIZATION | Santosh K Gupta
| ELECTRONICS FUNDAMENTALS AND APPLICATIONS | D Chattopadhyay
+-----+
8 rows in set (0.00 sec)
```

4.

```
mysql> SELECT author,eBook_title
-> FROM ebooks
-> WHERE ratings_value>3
-> UNION
-> SELECT Book_author,Book_title
-> FROM books;
+-----+-----+
| author          | eBook_title      |
+-----+-----+
| Navathe          | FUNDAMENTALS OF DATABASE SYSTEMS
| Abraham Silbershatz | BASIC MECHANICAL ENGINEERING
| Richard O Duda    | MACHINE LEARNING
| Alan V Oppenheim   | SIGNAL AND SYSTEMS
| W Bolton          | MECHATRONICS
| B.N DUTTA          | ESTIMATING AND COSTING IN CIVIL ENGINEERING
| Martin Kleppmann   | DESIGNING DATA-INTENSIVE APPLICATIONS
| Santosh K Gupta    | POLYMERIZATION
| D Chattopadhyay     | ELECTRONICS FUNDAMENTALS AND APPLICATIONS
| JB GUPTA          | PRACTICAL ELECTRONICS FOR INVENTORS
| JK GUPTA          | BASIC MECHANICAL ENGINEERING
| Andrew S Tanenbaum   | ELECTRICAL ENGINEERING FUNDAMENTALS
| Michael Sipser       | THEORY OF COMPUTATION
| JK GUPTA          | CIVIL ENGINEERING:CONVENTIONAL AND OBJECTIVE
| SUMITA ARORA        | INFORMATION TECHNOLOGY
| Anshu Srivastav     | POLYMER SCIENCE AND TECHNOLOGY
| JB GUPTA          | PRATICAL ELECTRONICS FOR INVENTORS
+-----+
17 rows in set (0.01 sec)
```

## GROUP BY:

1.

```
mysql> SELECT visit,COUNT(*) AS number_of_visitors
-> FROM Login
-> GROUP BY visit
-> ;
+-----+-----+
| visit    | number_of_visitors |
+-----+-----+
| reading  |          4         |
| borrow   |          3         |
| return   |          2         |
+-----+
3 rows in set (0.00 sec)
```

2.

```
mysql> SELECT visit,COUNT(*) AS number_of_visitors
-> FROM Login
-> GROUP BY visit
-> ORDER BY number_of_visitors;
+-----+-----+
| visit | number_of_visitors |
+-----+-----+
| return | 2 |
| borrow | 3 |
| reading | 4 |
+-----+-----+
3 rows in set (0.00 sec)
```

3.

```
mysql> SELECT member_id,COUNT(*) AS no_of_books_taken
-> FROM borrows
-> GROUP BY member_id
-> ORDER BY no_of_books_taken;
+-----+-----+
| member_id | no_of_books_taken |
+-----+-----+
| STU002 | 1 |
| STU003 | 1 |
| STU005 | 1 |
| STU001 | 2 |
| STU004 | 2 |
+-----+-----+
5 rows in set (0.00 sec)
```

## HAVING :

1.

```
mysql> SELECT fine_description,SUM(fine_amount) AS total_amount
-> FROM fine
-> WHERE fine_date!='2023-10-19'
-> GROUP BY fine_description
-> HAVING SUM(fine_amount)>50
-> ORDER BY total_amount DESC;
+-----+-----+
| fine_description | total_amount |
+-----+-----+
| Book damage | 90 |
+-----+-----+
1 row in set (0.01 sec)
```

2.

```
mysql> SELECT designation,COUNT(*) AS total_members
-> FROM staff
-> GROUP BY designation
-> HAVING COUNT(*)>1;
+-----+-----+
| designation | total_members |
+-----+-----+
| Cataloger   |          2 |
| Circulation_Clerk |          2 |
| Librarian    |          2 |
| Support_Staff |          2 |
+-----+
4 rows in set (0.00 sec)
```

3.

```
mysql> SELECT fine_description,SUM(fine_amount) AS total_amount
-> FROM fine
-> WHERE fine_date!='2023-10-17'
-> GROUP BY fine_description
-> HAVING SUM(fine_amount)>50
-> ORDER BY total_amount DESC;
+-----+-----+
| fine_description | total_amount |
+-----+-----+
| Book lost       |      800 |
| Book damage     |       90 |
+-----+
2 rows in set (0.00 sec)
```

## PATTERN- MATCHING:

1.

```
mysql> SELECT first_name,last_name,designation AS staff_who_joined_between_1990_and_2010
->     FROM staff
->     WHERE joining_year between 1990 and 2010;
+-----+-----+-----+
| first_name | last_name | staff_who_joined_between_1990_and_2010 |
+-----+-----+-----+
| Kumara     | S         | Circulation_Clerk
| Jeevith    | Patel     | Library_Assistant
| Kempanna   | Gowda    | Librarian
| Kumuda     | R         | Librarian
| Devika     | L         | Support_Staff
| Mahadevi   | M         | Support_Staff
| Susheela   | S         | Library_Technician
+-----+-----+-----+
7 rows in set (0.00 sec)
```

2.

```
mysql> SELECT * FROM Login
    -> WHERE DATE_FORMAT(t_date, '%Y-%m-%d') LIKE '2023-10%';
+-----+-----+-----+-----+-----+-----+-----+-----+
| login_id | first_name | last_name | t_date     | visit      | entry_time | exit_time | Department_name |
+-----+-----+-----+-----+-----+-----+-----+-----+
|      1 | Aniket     | Shetty    | 2023-10-23 | reading    | 02:30:25   | 03:30:25   | CSE
|      2 | Abhishek   | MB        | 2023-10-24 | borrow     | 04:30:00   | 05:30:45   | ISE
|      3 | Sinchana   | S         | 2023-10-24 | return     | 04:30:01   | 05:15:46   | MECH
|      4 | Anagha      | KP        | 2023-10-24 | reading    | 04:30:30   | 05:22:12   | EEE
|      5 | Kirtana    | Kiran     | 2023-10-24 | reading    | 04:30:56   | 05:05:33   | CSE
|      6 | John        | Samuel    | 2023-10-25 | borrow     | 01:35:24   | 02:20:30   | IP
|      7 | Jagruth    | Kumar     | 2023-10-25 | return     | 03:38:48   | 04:20:55   | ENVI
|      8 | Vivek       | Patel     | 2023-10-26 | borrow     | 09:55:45   | 10:45:22   | CSE
|      9 | Aditya     | verma     | 2023-10-28 | reading    | 02:30:45   | 03:00:00   | ISE
+-----+-----+-----+-----+-----+-----+-----+-----+
9 rows in set (0.01 sec)
```

3.

```
mysql> SELECT eBook_id, eBook_title
    -> FROM EBooks
    -> WHERE eBook_title LIKE '%Database%';
+-----+-----+
| eBook_id | eBook_title           |
+-----+-----+
|      1 | FUNDAMENTALS OF DATABASE SYSTEMS |
+-----+-----+
1 row in set (0.00 sec)
```

4.

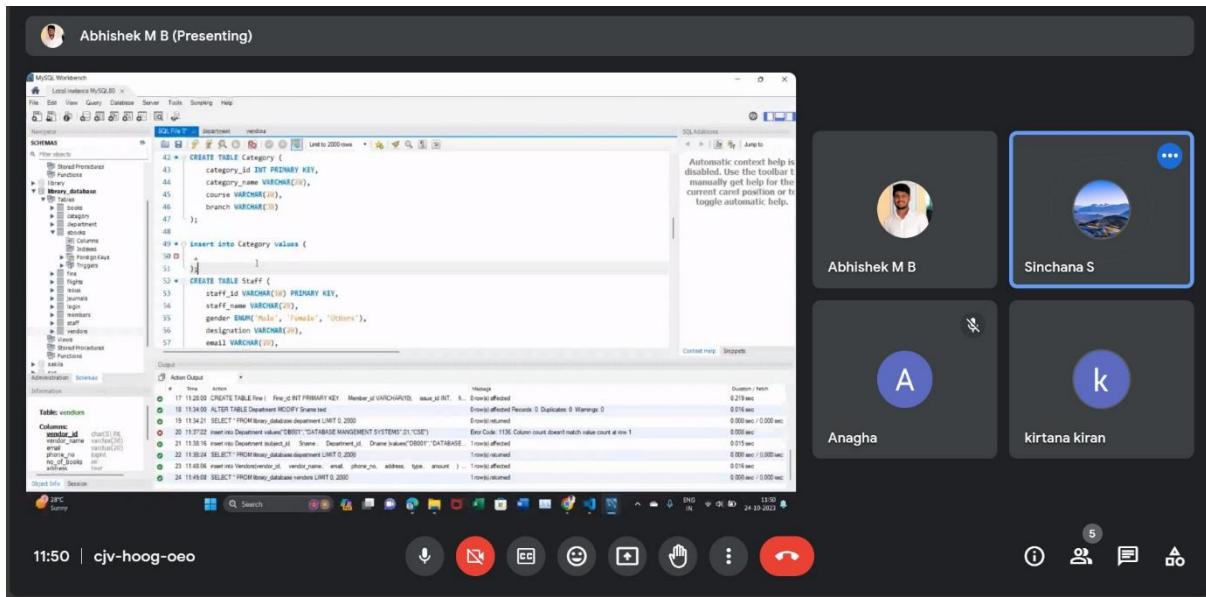
```
mysql> SELECT * FROM Login
    -> WHERE DATE_FORMAT(t_date, '%Y-%m-%d') LIKE '2023-10-25';
+-----+-----+-----+-----+-----+-----+-----+
| login_id | first_name | last_name | t_date     | visit      | entry_time | exit_time | Department_name |
+-----+-----+-----+-----+-----+-----+-----+
|      6 | John        | Samuel    | 2023-10-25 | borrow     | 01:35:24   | 02:20:30   | IP
|      7 | Jagruth    | Kumar     | 2023-10-25 | return     | 03:38:48   | 04:20:55   | ENVI
+-----+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

## INTERACTION WITH STAKEHOLDERS

Regular communication with real-time stakeholders from the library facilitated a comprehensive understanding of user requirements and domain intricacies, significantly aiding the development of accurate ER diagrams and a profound grasp of the database schema."



Engaging collaboratively with team members has facilitated productive discussions, fostering an environment conducive to creative problem-solving and efficient decision-making."



## 5. CONCLUSION

The Library Management System is essential for colleges, schools and many more places these days. A lot of manual work can be reduced with this Library Management System. And also, a lot of glitches like wrong borrow date and miscalculation of fine amount can be avoided. This computer-managed system is efficient and cost-effective. The Library Management System stores details of books, e-book, staff, members, and fine details as well. So overall we have learnt: how to build a database to store related information, how to build tables separately to store data, implementations of MySQL and how the software allows storing all the details related to the library. This system makes entire process online where student can search books, staff can generate reports and maintain book transactions.

## 6. REFERENCES

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