**Group Project: Library Management System**

**Project Overview**

This project involves creating a comprehensive Library Management System using Microsoft Access. The students will work in groups to design and implement a database that manages the various operations of a library. The system should include multiple tables with relationships, queries for data retrieval, forms for data entry, and reports for data analysis.

**Objectives**

1. Understand and apply the principles of database design.
2. Develop skills in creating and managing tables and relationships.
3. Practice writing and executing queries for data manipulation and retrieval.
4. Design forms for user-friendly data entry.
5. Generate reports for data analysis and presentation.

**Project Requirements**

1. **Database Design:**
   * Design an Entity-Relationship (ER) diagram for the library management system.
   * Create at least six tables: Books, Authors, Members, Loans, Staff, and Categories.
   * Define appropriate relationships between tables (e.g., one-to-many, many-to-many).
2. **Tables and Relationships:**
   * **Books:** BookID (Primary Key), Title, AuthorID (Foreign Key), CategoryID (Foreign Key), ISBN, PublicationYear, Publisher, CopiesAvailable.
   * **Authors:** AuthorID (Primary Key), FirstName, LastName, BirthDate, Country.
   * **Members:** MemberID (Primary Key), FirstName, LastName, Address, PhoneNumber, Email, JoinDate, MembershipType.
   * **Loans:** LoanID (Primary Key), BookID (Foreign Key), MemberID (Foreign Key), LoanDate, ReturnDate, DueDate, StaffID (Foreign Key).
   * **Staff:** StaffID (Primary Key), FirstName, LastName, Position, HireDate, Email, PhoneNumber.
   * **Categories:** CategoryID (Primary Key), CategoryName, Description.
3. **Queries:**
   * Create queries to answer the following:
     + List all books that are currently on loan.
     + Find all overdue books and the members who borrowed them.
     + List all books by a particular author.
     + Generate a report of books categorized by genre.
     + Find members who have borrowed more than a certain number of books in the past month.
     + Calculate the total number of loans processed by each staff member.
4. **Forms:**
   * Create a form for adding and updating book details.
   * Create a form for member registration and updating member information.
   * Design a form for recording loan transactions.
5. **Reports:**
   * Generate a report of all books in the library, sorted by category.
   * Create a report listing all active members and their contact information.
   * Generate a report of overdue books and the fines associated with each (assume a fine structure).
6. **User Interface:**
   * Design a user-friendly navigation system within Access for easy access to forms, queries, and reports.
7. **Documentation:**
   * Provide a detailed project report including:
     + ER diagram.
     + Database schema.
     + Explanation of relationships and constraints.
     + Description of each query, form, and report created.
     + Instructions on how to use the system.

**Project Timeline**

* **Week 3-4:** Project planning, group formation, requirement analysis, and ER diagram design.
* **Week 5-6:** Create tables and define relationships.
* **Week 7-8:** Develop queries and forms.
* **Week 9-10:** Generate reports and design the user interface.
* **Week 11-14:** Testing, debugging, and final documentation.
* **Week 15:** Project presentation and demonstration.

**Assessment Criteria**

* **Database Design (20%)**
* **Implementation of Tables and Relationships (20%)**
* **Queries (20%)**
* **Forms and User Interface (20%)**
* **Reports (10%)**
* **Documentation and Presentation (10%)**

This project aims to provide students with practical experience in database design and implementation, reinforcing their understanding of database concepts and their ability to use Microsoft Access effectively.

Here is a sample dataset for each table in the Library Management System project.

### \*\*Books Table\*\*

| BookID | Title | AuthorID | CategoryID | ISBN | PublicationYear | Publisher | CopiesAvailable |

|--------|----------------------------------|----------|------------|----------------|-----------------|--------------------|-----------------|

| 1 | Database Systems | 1 | 1 | 9780132146561 | 2010 | Pearson | 5 |

| 2 | Introduction to Algorithms | 2 | 2 | 9780262033848 | 2009 | MIT Press | 4 |

| 3 | Clean Code | 3 | 3 | 9780132350884 | 2008 | Prentice Hall | 3 |

| 4 | The Pragmatic Programmer | 4 | 3 | 9780201616224 | 1999 | Addison-Wesley | 6 |

| 5 | Design Patterns | 5 | 3 | 9780201633610 | 1994 | Addison-Wesley | 2 |

### \*\*Authors Table\*\*

| AuthorID | FirstName | LastName | BirthDate | Country |

|----------|-----------|-------------|------------|----------------|

| 1 | Abraham | Silberschatz| 1952-05-28 | USA |

| 2 | Thomas H. | Cormen | 1956-10-08 | USA |

| 3 | Robert | Martin | 1952-12-05 | USA |

| 4 | Andrew | Hunt | 1964-06-11 | USA |

| 5 | Erich | Gamma | 1961-03-13 | Switzerland |

### \*\*Members Table\*\*

| MemberID | FirstName | LastName | Address | PhoneNumber | Email | JoinDate | MembershipType |

|----------|-----------|-----------|-------------------------|---------------|------------------------|------------|----------------|

| 1 | Alice | Smith | 123 Main St, Springfield| 555-1234 | alice@example.com | 2023-01-15 | Regular |

| 2 | Bob | Johnson | 456 Elm St, Springfield | 555-5678 | bob@example.com | 2023-02-20 | Premium |

| 3 | Carol | Davis | 789 Oak St, Springfield | 555-8765 | carol@example.com | 2023-03-25 | Regular |

| 4 | David | Wilson | 101 Pine St, Springfield| 555-4321 | david@example.com | 2023-04-30 | Regular |

| 5 | Eve | Brown | 202 Birch St, Springfield| 555-8765 | eve@example.com | 2023-05-10 | Premium |

### \*\*Loans Table\*\*

| LoanID | BookID | MemberID | LoanDate | ReturnDate | DueDate | StaffID |

|--------|--------|----------|------------|-------------|------------|---------|

| 1 | 1 | 1 | 2024-06-01 | 2024-06-15 | 2024-06-14 | 1 |

| 2 | 3 | 2 | 2024-06-05 | 2024-06-19 | 2024-06-18 | 2 |

| 3 | 2 | 3 | 2024-06-10 | NULL | 2024-06-24 | 3 |

| 4 | 5 | 4 | 2024-06-15 | NULL | 2024-06-29 | 4 |

| 5 | 4 | 5 | 2024-06-17 | NULL | 2024-07-01 | 5 |

### \*\*Staff Table\*\*

| StaffID | FirstName | LastName | Position | HireDate | Email | PhoneNumber |

|---------|-----------|----------|-------------------|------------|----------------------|---------------|

| 1 | John | Miller | Librarian | 2020-05-15 | john.m@example.com | 555-1230 |

| 2 | Jane | Taylor | Assistant Librarian| 2021-03-10 | jane.t@example.com | 555-5670 |

| 3 | Paul | Anderson | Clerk | 2019-11-25 | paul.a@example.com | 555-8760 |

| 4 | Mark | Thompson | Librarian | 2018-07-30 | mark.t@example.com | 555-4320 |

| 5 | Susan | Clark | Manager | 2017-02-15 | susan.c@example.com | 555-8760 |

### \*\*Categories Table\*\*

| CategoryID | CategoryName | Description |

|------------|--------------|----------------------------|

| 1 | Databases | Books about database design and implementation |

| 2 | Algorithms | Books on algorithms and data structures |

| 3 | Programming | Books on software development and programming practices |

#### Notes:

- \*\*LoanDate\*\*: The date the book was borrowed.

- \*\*ReturnDate\*\*: The date the book was returned. If the book is not yet returned, this field is NULL.

- \*\*DueDate\*\*: The date the book is due to be returned.

- \*\*MembershipType\*\*: This can be "Regular" or "Premium" with different borrowing privileges.

This dataset can be expanded or modified as needed for the project.