Sample Queries for the Library Management System

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To begin with, we have created the database first, namely ***LibraryDB***. Then, we created the tables in another file, ***LibraryDBTables.sql*** and run it to create the tables. Then, we have set up some triggers to automate our database in ***LibraryDBTriggers.sql*** file and run it. Then, we Polpulate our database using ***LibraryDBData.sql*** file. Here is a the snapshot of the process.

```
mysql> CREATE DATABASE LibraryDB;
Query OK, 1 row affected (0.01 sec)

mysql> USE LibraryDB;
Database changed
mysql> SOURCE LibraryDBTables.sql;
Query OK, 0 rows affected (0.05 sec)

Query OK, 0 rows affected (0.04 sec)

Query OK, 0 rows affected (0.04 sec)

Query OK, 0 rows affected (0.10 sec)

Query OK, 0 rows affected (0.09 sec)

Query OK, 0 rows affected (0.05 sec)

mysql> SOURCE LibraryDBTriggers.sql;
Query OK, 0 rows affected (0.02 sec)

Query OK, 0 rows affected (0.02 sec)

Query OK, 0 rows affected (0.03 sec)

mysql> SOURCE LibraryDBData.sql;
Query OK, 14 rows affected (0.02 sec)
Records: 14  Duplicates: 0  Warnings: 0

Query OK, 4 rows affected (0.01 sec)
Records: 4  Duplicates: 0  Warnings: 0

Query OK, 8 rows affected (0.02 sec)
Records: 8  Duplicates: 0  Warnings: 0

Query OK, 11 rows affected (0.01 sec)
Records: 11  Duplicates: 0  Warnings: 0

Query OK, 7 rows affected (0.03 sec)
Records: 7  Duplicates: 0  Warnings: 0

mysql> _
```

Now as we have created our database here are sample queries to demonstrate:

Find all members who have an active membership status:

```
mysql> SELECT * FROM Members WHERE MembershipStatus = 'Active';
+----------+---------------+------------------------+-------------+---------------------+------------------+
| MemberID | Name          | Address                | Phone       | Email               | MembershipStatus |
+----------+---------------+------------------------+-------------+---------------------+------------------+
| M001     | Aakash Das    | Medinipur, West Bengal | 9733447809  | NULL                | Active           |
| M003     | Rohit Yadav   | Akbarpur, UP           | 9322108528  | NULL                | Active           |
| M004     | Subhas Bhutia | Silchar, Assam         | 6290874517  | NULL                | Active           |
| M005     | Meena Vandana | Egmore, Chennai        | 93465920755 | meena.v32@yahoo.com | Active           |
| M007     | Arun Sen      | Ramnagar, UP           | 6752098176  | asen987@hotmail.com | Active           |
| M008     | Nawaz Khan    | Kolkata                | 7865409134  | khann1@gmail.com    | Active           |
+----------+---------------+------------------------+-------------+---------------------+------------------+
6 rows in set (0.00 sec)

mysql> _
```

Find all staff members who joined the library after January 1st, 2015:

```
mysql> SELECT * FROM Staffs WHERE DoJ > '2015-01-01';
+---------+-------------+-------------------+------------+----------------------+------------+
| StaffID | Name        | Address           | Phone      | Email                | DoJ        |
+---------+-------------+-------------------+------------+----------------------+------------+
| S003    | Rani Sharma | Jalgaon, Mumbai   | 6387903419 | r.sharma@library.com | 2016-01-18 |
| S004    | Anek Bose   | Yadavpur, Kolkata | 9434110988 | a.bose@library.com   | 2017-12-12 |
+---------+-------------+-------------------+------------+----------------------+------------+
2 rows in set (0.00 sec)

mysql> _
```

Find name and author of all books that are currently borrowed by someone:

```
mysql> SELECT Title, Author FROM Books WHERE AvailableCopies < TotalCopies;
+-----------------------------------------------------------------------------+-----------------------------+
| Title                                                                       | Author                      |
+-----------------------------------------------------------------------------+-----------------------------+
| Sera Satyajit                                                               | Satyajit Ray                |
| Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones | James Clear                 |
| Chander Pahar                                                               | Bibhutibhushan Bandyopadhyay |
+-----------------------------------------------------------------------------+-----------------------------+
3 rows in set (0.00 sec)

mysql> _
```

Find all members who have borrowed a book and name of the book:

```
mysql> SELECT
    ->     m.*, b.Title AS Book_Name
    -> FROM
    ->     Members m
    ->     INNER JOIN IssuedBooks ib
    ->     ON m.MemberID = ib.MemberID
    ->     INNER JOIN Books b
    ->     ON ib.BookID = b.BookID
    -> ;
+----------+---------------+------------------------+-------------+---------------------+------------------+-----------------------------------------------------------------------------+
| MemberID | Name          | Address                | Phone       | Email               | MembershipStatus | Book_Name                                                                   |
+----------+---------------+------------------------+-------------+---------------------+------------------+-----------------------------------------------------------------------------+
| M001     | Aakash Das    | Medinipur, West Bengal | 9733447809  | NULL                | Active           | Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones |
| M003     | Rohit Yadav   | Akbarpur, UP           | 9322108528  | NULL                | Active           | Scooby-Doo and the Pirate Treasure                                          |
| M006     | Priya Vadane  | Kharghar, Navi Mumbai  | 7064783901  | NULL                | Not Active       | The World"s Greatest Short Stories                                          |
| M004     | Subhas Bhutia | Silchar, Assam         | 6290874517  | NULL                | Active           | Gitanjali                                                                   |
| M002     | Rajiv Kr.     | Gaya, Bihar            | 761093746   | rkr1221@gmail.com   | Not Active       | Chander Pahar                                                               |
| M001     | Aakash Das    | Medinipur, West Bengal | 9733447809  | NULL                | Active           | The World"s Greatest Short Stories                                          |
| M005     | Meena Vandana | Egmore, Chennai        | 93465920755 | meena.v32@yahoo.com | Active           | Inspirational Sports Stories for Young Readers                              |
| M007     | Arun Sen      | Ramnagar, UP           | 6752098176  | asen987@hotmail.com | Active           | An Outline of Statistical Theory Vol 1                                      |
| M005     | Meena Vandana | Egmore, Chennai        | 93465920755 | meena.v32@yahoo.com | Active           | Sera Satyajit                                                               |
| M008     | Nawaz Khan    | Kolkata                | 7865409134  | khann1@gmail.com    | Active           | Chander Pahar                                                               |
| M008     | Nawaz Khan    | Kolkata                | 7865409134  | khann1@gmail.com    | Active           | Atomic Habits: An Easy & Proven Way to Build Good Habits & Break Bad Ones |
+----------+---------------+------------------------+-------------+---------------------+------------------+-----------------------------------------------------------------------------+
11 rows in set (0.00 sec)

mysql> _
```

Calculate the total number of issued books and received books by each staff member:

```
mysql>
mysql> SELECT
    ->     ib.StaffID,
    ->     ib.Issued,
    ->     rb.Received
    -> FROM
    ->     (SELECT
    ->         IssuedBy AS StaffID,
    ->         COUNT(*) AS Issued
    ->      FROM IssuedBooks
    ->      GROUP BY IssuedBy) ib
    -> JOIN
    ->     (SELECT
    ->         ReceivedBy,
    ->         COUNT(*) AS Received
    ->      FROM ReturnBooks
    ->      GROUP BY ReceivedBy) rb
    -> ON ib.StaffID = rb.ReceivedBy
    -> ;
+---------+--------+----------+
| StaffID | Issued | Received |
+---------+--------+----------+
| S001    |      4 |        1 |
| S002    |      3 |        2 |
| S003    |      3 |        1 |
| S004    |      1 |        3 |
+---------+--------+----------+
4 rows in set (0.01 sec)

mysql> _
```

Find which book has been borrowed maximum:

```
mysql> SELECT
    ->     ib.BookID,
    ->     b.Title,
    ->     COUNT(*) AS Borrowed_Number
    -> FROM
    ->     IssuedBooks ib
    ->     JOIN Books b
    ->     ON ib.BookID = b.BookID
    -> GROUP BY 1
    -> ORDER BY 3 DESC
    -> LIMIT 1;
+--------+-----------------------------------+-----------------+
| BookID | Title                             | Borrowed_Number |
+--------+-----------------------------------+-----------------+
| B012   | The World"s Greatest Short Stories |               2 |
+--------+-----------------------------------+-----------------+
1 row in set (0.00 sec)

mysql> _
```

Calculate the total and average amount of fines levied for all returned books:

```
mysql> SELECT SUM(FineAmount) AS Total_Fine, AVG(FineAmount) AS Average_Fine FROM Fine;
+------------+--------------+
| Total_Fine | Average_Fine |
+------------+--------------+
|     300.00 |    42.857143 |
+------------+--------------+
1 row in set (0.00 sec)

mysql> _
```

Find name, author, publishers of all books that have never been borrowed:

```
mysql> SELECT Books.Title, Books.Author, Books.Publisher FROM Books LEFT JOIN IssuedBooks ON Books.BookID = IssuedBooks.BookID WHERE IssuedBooks.IssuedID IS NULL;
+-------------------------------------------------------------+-------------------------+-----------------------------------------+
| Title                                                       | Author                  | Publisher                               |
+-------------------------------------------------------------+-------------------------+-----------------------------------------+
| How to Catch an Elf                                         | Andy Elkerton, Adam Wallace | Sourcebooks Wonderland                  |
| Weyward                                                     | Emilia Hart             | St. Martin Press                        |
| 1001 Arabian Nights                                         | NULL                    | CreateSpace Independent Publishing Platform |
| Godaan                                                      | Munshi Premchand        | Fingerprint! Publishing                 |
| Dungeons & Dragons: Honor Among Thieves: The Road to Neverwinter | Jaleigh Johnson         | Random House Worlds                     |
| Grizzly Killer: The Making of a Mountain Man                | Lane R. Warenski        | Wolfpack Publishing                     |
+-------------------------------------------------------------+-------------------------+-----------------------------------------+
6 rows in set (0.00 sec)

mysql> _
```

Find all members who have borrowed books that are overdue and calculate their total fine amount:

```
mysql> SELECT
    ->     Members.*,
    ->     IssuedBooks.DueDate,
    ->     DATEDIFF(CURDATE(), IssuedBooks.DueDate) * 5 AS TotalFineAmount
    -> FROM
    ->     Members
    ->     INNER JOIN IssuedBooks ON Members.MemberID = IssuedBooks.MemberID
    -> WHERE
    ->     IssuedBooks.DueDate < CURDATE()
    ->     AND
    ->     IssuedID NOT IN (Select IssuedID from ReturnBooks)
    -> ;
+----------+-----------+-------------+-----------+-------------------+------------------+------------+-----------------+
| MemberID | Name      | Address     | Phone     | Email             | MembershipStatus | DueDate    | TotalFineAmount |
+----------+-----------+-------------+-----------+-------------------+------------------+------------+-----------------+
| M002     | Rajiv Kr. | Gaya, Bihar | 761093746 | rkr1221@gmail.com | Not Active       | 2021-12-12 |            2270 |
+----------+-----------+-------------+-----------+-------------------+------------------+------------+-----------------+
1 row in set (0.00 sec)

mysql>
mysql> _
```