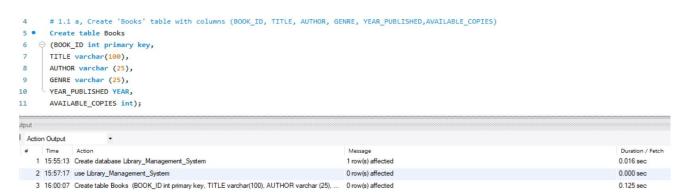
1.1: Database & Schema Creation

Database: Library_Management_System

1 • Create database Library_Management_System;



1.1 a) Create **Books** table with columns (**BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_COPIES)**



1.1 b) Create Members table with columns (MEMBER_ID, NAME, EMAIL, PHONE_NO, ADDRESS, MEMBERSHIP_DATE)

```
#1.1 B) Create Members table with columns (MEMBER_ID, NAME, EMAIL, PHONE_NO, ADDRESS, MEMBERSHIP_DATE)
13
14 • Create table Members
     (MEMBER_ID INT primary key,
        NAME varchar (25),
16
17
        EMAIL varchar (25),
        PHONE_NO bigint,
18
19
        ADDRESS varchar(100),
        MEMBERSHIP_DATE DATE);
20
o1
utput
Action Output
    1 15:55:13 Create database Library_Management_System
                                                                                          1 row(s) affected
                                                                                                                                                                     0.016 sec
2 15:57:17 use Library_Management_System
    3 16:00:07 Create table Books (BOOK_ID int primary key, TITLE varchar(100), AUTHOR varchar (25), ...
                                                                                          0 row(s) affected
                                                                                                                                                                     0.125 sec
4 16:05:49 Create table Members (MEMBER_ID INT primary key, NAME varchar (25), EMAIL varchar (2... 0 row(s) affected
```

1.1 C) Create BorrowingRecords table with columns BORROW_ID, MEMBER_ID,

BOOK_ID, BORROW_DATE, RETURN_DATE.

Set foreign key constraints linking MEMBER_ID to Members and BOOK_ID to Books.

```
#1.1 C) Create BorrowingRecords table with columns BORROW_ID, MEMBER_ID, BOOK_ID, BORROW_DATE, RETURN_DATE.
     #Set foreign key constraints linking MEMBER_ID to Members and BOOK_ID to Books.
   Create table BorrowingRecords
    (BORROW_ID INT primary key,
    MEMBER ID INT,
    BOOK_ID INT,
     BORROW_DATE DATE,
    RETURN DATE DATE,
     Foreign key (MEMBER_ID) References Members(MEMBER_ID),
     Foreign key (BOOK_ID) references Books (BOOK_ID));
ction Output
                                                                                                                                                                     Duration / Fetch
                                                                                         Message
 1 15:55:13 Create database Library_Management_System
                                                                                        1 row(s) affected
2 15:57:17 use Library_Management_System
                                                                                        0 row(s) affected
                                                                                                                                                                     0.000 sec
 3 16:00:07 Create table Books (BOOK_ID int primary key, TITLE varchar(100), AUTHOR varchar (25), ... 0 row(s) affected
                                                                                                                                                                     0.125 sec
4 16:05:49 Create table Members (MEMBER_ID INT primary key, NAME varchar (25), EMAIL varchar (2... 0 row(s) affected
                                                                                                                                                                     0.062 sec
 5 16:11:30 Create table BorrowingRecords (BORROW_ID INT primary key, MEMBER_ID INT, BOOK_I... 0 row(s) affected
                                                                                                                                                                     0.109 sec
```

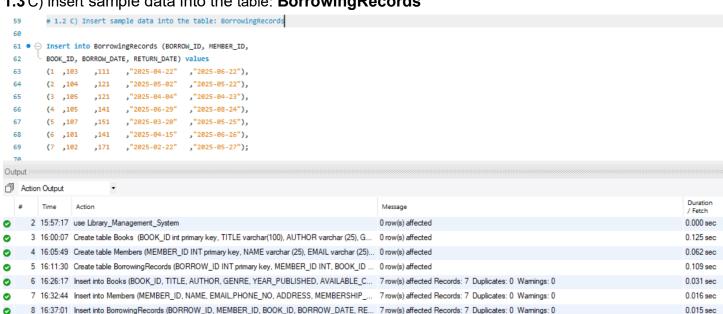
1.2: Data Creation

1.2 a) Insert sample data into the table: Books

```
# 1.2: Data Creation
  # 1.2 a) Insert sample data into the table: Books
) Insert into Books (BOOK_ID, TITLE, AUTHOR, GENRE,
YEAR_PUBLISHED, AVAILABLE_COPIES) value
  (111, 'Pride and Prejudice', 'Jane Austen', 'Fiction', 2002, 22),
  (121, 'The Guide', 'Narayan', 'Humor', 2004, 25),
  (131,'God of Small Things','Arundhati Roy','Psychological',2007,5),
  (141, 'Suitable Boy', 'Vikram Seth', 'Drama', 2010, 34),
  (151, 'THE SILENT PATIENT', 'Alex', 'Thriller', 1984,51),
  (161, 'Harry Potter', 'Rowling', 'Fantasy', 1991, 27),
  (171, 'The Lord of the Rings', 'Tolkien', 'Fantasy', 2001, 12);
1 Output
                                                                                                                                                                                        Duration
15:55:13 Create database Library_Management_System
                                                                                                 1 row(s) affected
                                                                                                                                                                                       0.016 sec
15:57:17 use Library_Management_System
                                                                                                0 row(s) affected
                                                                                                                                                                                       0.000 sec
16:00:07 Create table Books (BOOK_ID int primary key, TITLE varchar(100), AUTHOR varchar (25), GE... 0 row(s) affected
                                                                                                                                                                                       0.125 sec
16:05:49 Create table Members (MEMBER_ID INT primary key, NAME varchar (25), EMAIL varchar (25), ... 0 row(s) affected
                                                                                                                                                                                       0.062 sec
16:11:30 Create table BorrowingRecords (BORROW_ID INT primary key, MEMBER_ID INT, BOOK_ID I... 0 row(s) affected
                                                                                                                                                                                       0.109 sec
16:26:17 Insert into Books (BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_CO... 7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0
                                                                                                                                                                                       0.031 sec
```

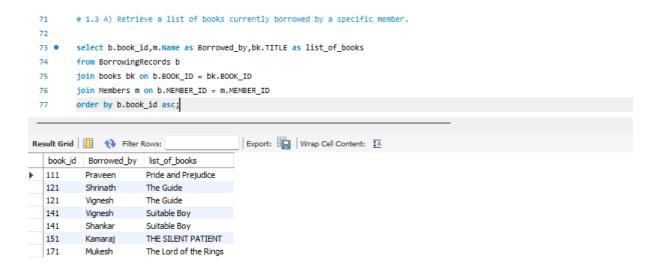
```
#1.2 b) Insert sample data into the table : Members
  49 • G Insert into Members (MEMBER ID, NAME, EMAIL, PHONE NO.
  50
         ADDRESS, MEMBERSHIP DATE) value
           (101, 'Shankar', 'Shankar@gmail.com', '9176221122', 'Madavaram, Chennai', '2025-04-25'),
  52
          (102, 'Mukesh', 'Mukesh@gmail.com', 9176220413, 'Kodambakkam, Chennai', '2025-05-26'),
          (103, 'Praveen', 'Praveen@gmail.com', 9176220474, 'Anna Nagar, Chennai', '2025-07-27'),
  53
          (104, 'Shrinath', 'Shrinath@gmail.com', 9176110415, 'Saidapet, Chennai', '2025-04-21'),
          (105,'Vignesh', 'Vignesh@gmail.com',9176239116, 'velachery,Chennai','2025-04-22'),
          (106, 'Vimalrka', 'Vimalrka@gmail.com',9135674171, 'Tambaram,Chennai','2025-07-28').
  56
  57
          (107, 'Kamaraj', 'Kamaraj@gmail.com', 9176220418, 'Medavakkam, Chennai', '2025-05-31');
Output :
Action Output
                                                                                                                                                                                            Duration
/ Fetch
     1 15:55:13 Create database Library_Management_System
                                                                                                                                                                                           0.016 sec
                                                                                                       1 row(s) affected
     2 15:57:17 use Library_Management_System
                                                                                                      0 row(s) affected
                                                                                                                                                                                           0.000 sec
      3 16:00:07 Create table Books (BOOK_ID int primary key, TITLE varchar(100), AUTHOR varchar (25), GE... 0 row(s) affected
                                                                                                                                                                                           0.125 sec
     4 16:05:49 Create table Members (MEMBER_ID INT primary key, NAME varchar (25), EMAIL varchar (25), ...
                                                                                                                                                                                           0.062 sec
      5 16:11:30 Create table BorrowingRecords (BORROW ID INT primary key, MEMBER ID INT, BOOK ID I... 0 row(s) affected
                                                                                                                                                                                           0.109 sec
a 6 16:26:17 Insert into Books (BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_CO... 7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0
                                                                                                                                                                                           0.031 sec
      7 16:32:44 Insert into Members (MEMBER_ID, NAME, EMAIL, PHONE_NO, ADDRESS, MEMBERSHIP_D... 7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0
                                                                                                                                                                                           0.016 sec
```

1.3 C) Insert sample data into the table: BorrowingRecords

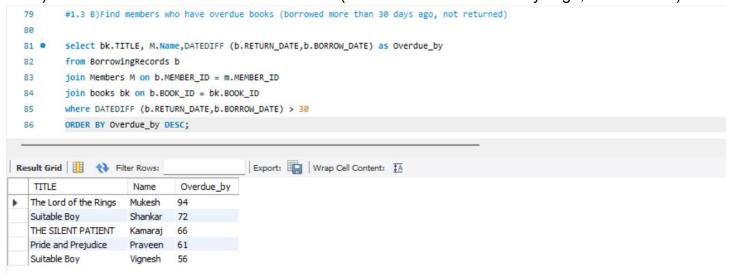


1.3: Information Retrieval

1.3 a) Retrieve a list of books currently borrowed by a specific member.



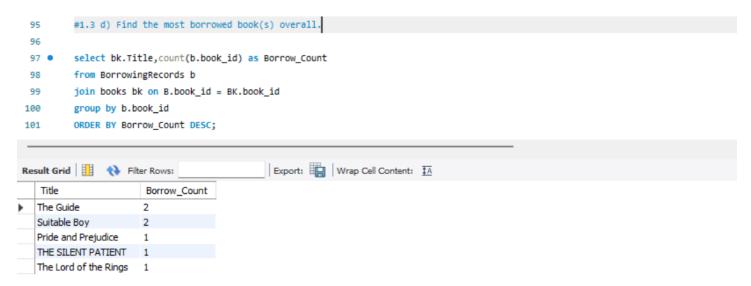
1.3 b) Find members who have overdue books (borrowed more than 30 days ago, not returned)



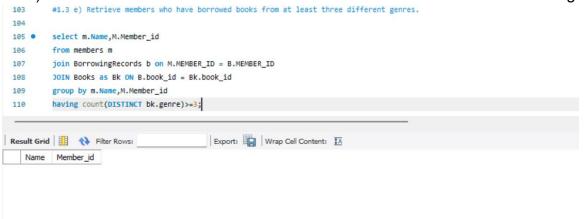
1.3c) Retrieve books by genre along with the count of available copies.

```
#1.3 c)# Retrieve books by genre along with the count of available copies
 89
 90 •
         SELECT Genre, SUM(AVAILABLE_COPIES) AS count_of_available_copies
         FROM Books
 92
         GROUP BY Genre
         ORDER BY count_of_available_copies DESC ;
                                            Export: Wrap Cell Content: IA
Genre
               count_of_available_copies
  Thriller
  Fantasy
               39
  Drama
               34
  Humor
               25
  Fiction
               22
  Psychological 5
```

1.3 d) Find the most borrowed book(s) overall.



1.4 e) Retrieve members who have borrowed books from at least three different genres.



1.4 Reporting and Analytics:

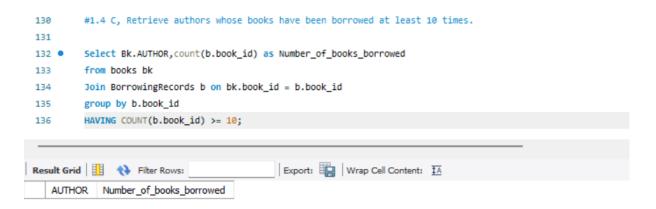
1.4 a) Calculate the total number of books borrowed per month.

```
# Reporting and Analytics:
112
         # a) Calculate the total number of books borrowed per month.
113
114
         SELECT DATE_FORMAT(Borrow_date, '%Y-%m') AS Borrow_month, COUNT(*) AS Total_books_borrowed
115 •
         FROM BorrowingRecords b
116
117
         GROUP BY Borrow month
         ORDER BY Total_books_borrowed desc;
Export: Wrap Cell Content: TA
                Total_books_borrowed
   Borrow_month
  2025-04
   2025-05
                1
   2025-06
                1
   2025-03
   2025-02
                1
```

1.4 b) Find the top three most active members based on the number of books borrowed.

```
120
         #1.4 b) Find the top three most active members based on the number of books borrowed.
121
122 •
         select M.Name,count(b.book_id) as Number_of_books_borrowed
123
         from members m
         join BorrowingRecords b on M.MEMBER_ID = B.MEMBER_ID
124
         join books bk on bk.book_id = b.book_id
125
         group by M.name
126
         order by Number_of_books_borrowed desc
127
128
         limit 3;
                                           Export: Wrap Cell Content: 🚻 Fetch rows:
Number_of_books_borrowed
   Name
  Vignesh
  Shankar 1
  Mukesh
```

1.4 C) Retrieve authors whose books have been borrowed at least 10 times.



1.5 d) Identify members who have never borrowed a book.

