

## 1.1: Database & Schema Creation

### Database: Library\_Management\_System

```
1 • Create database Library_Management_System;
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
✓ 1	15:55:13	Create database Library_Management_System	1 row(s) affected	0.016 sec

#### 1.1 a) Create **Books** table with columns (**BOOK\_ID**, **TITLE**, **AUTHOR**, **GENRE**, **YEAR\_PUBLISHED**, **AVAILABLE\_COPIES**)

```
4 # 1.1 a, Create 'Books' table with columns (BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_COPIES)
5 • Create table Books
6 (BOOK_ID int primary key,
7  TITLE varchar(100),
8  AUTHOR varchar (25),
9  GENRE varchar (25),
10 YEAR_PUBLISHED YEAR,
11 AVAILABLE_COPIES int);
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	15:55:13	Create database Library_Management_System	1 row(s) affected	0.016 sec
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

#### 1.1 b) Create **Members** table with columns (**MEMBER\_ID**, **NAME**, **EMAIL**, **PHONE\_NO**, **ADDRESS**, **MEMBERSHIP\_DATE**)

```
13 #1.1 B) Create Members table with columns (MEMBER_ID, NAME, EMAIL, PHONE_NO, ADDRESS, MEMBERSHIP_DATE)
14 • Create table Members
15 (MEMBER_ID INT primary key,
16  NAME varchar (25),
17  EMAIL varchar (25),
18  PHONE_NO bigint,
19  ADDRESS varchar(100),
20  MEMBERSHIP_DATE DATE);
```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	15:55:13	Create database Library_Management_System	1 row(s) affected	0.016 sec
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 (25), ...	0 row(s) affected	0.062 sec

#### 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));

Time	Action	Message	Duration / Fetch
1 15:55:13	Create database Library_Management_System	1 row(s) affected	0.016 sec
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_ID...	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);
```

Time	Action	Message	Duration / Fetch
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**

```

47 #1.2 b) Insert sample data into the table : Members
48
49 Insert into Members (MEMBER_ID, NAME, EMAIL,PHONE_NO,
50 ADDRESS, MEMBERSHIP_DATE) value
51 (101,'Shankar','Shankar@gmail.com', '9176221122','Madavaram, Chennai','2025-04-25'),
52 (102,'Mukesh','Mukesh@gmail.com',9176220413, 'Kodambakkam,Chennai','2025-05-26'),
53 (103,'Praveen','Praveen@gmail.com',9176220474, 'Anna Nagar,Chennai','2025-07-27'),
54 (104,'Shrinath','Shrinath@gmail.com',9176110415, 'Saidapet,Chennai','2025-04-21'),
55 (105,'Vignesh','Vignesh@gmail.com',9176239116, 'velachery,Chennai','2025-04-22'),
56 (106,'Vimalrka','Vimalrka@gmail.com',9135674171, 'Tambaram,Chennai','2025-07-28'),
57 (107,'Kamaraj','Kamaraj@gmail.com',9176220418, 'Medavakkam,Chennai','2025-05-31');
58

```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
1	15:55:13	Create database Library_Management_System	1 row(s) affected	0.016 sec
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 row(s) affected	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
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**

```

59 # 1.2 C) Insert sample data into the table: BorrowingRecords
60
61 Insert into BorrowingRecords (BORROW_ID, MEMBER_ID,
62 BOOK_ID, BORROW_DATE, RETURN_DATE) values
63 (1 ,103 ,111 , "2025-04-22" , "2025-06-22"),
64 (2 ,104 ,121 , "2025-05-02" , "2025-05-22"),
65 (3 ,105 ,121 , "2025-04-04" , "2025-04-23"),
66 (4 ,105 ,141 , "2025-06-29" , "2025-08-24"),
67 (5 ,107 ,151 , "2025-03-20" , "2025-05-25"),
68 (6 ,101 ,141 , "2025-04-15" , "2025-06-26"),
69 (7 ,102 ,171 , "2025-02-22" , "2025-05-27");
70

```

Output				
Action Output				
#	Time	Action	Message	Duration / Fetch
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), G...	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 row(s) affected	0.062 sec
5	16:11:30	Create table BorrowingRecords (BORROW_ID INT primary key, MEMBER_ID INT, BOOK_ID ...	0 row(s) affected	0.109 sec
6	16:26:17	Insert into Books (BOOK_ID, TITLE, AUTHOR, GENRE, YEAR_PUBLISHED, AVAILABLE_C...	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_...	7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0	0.016 sec
8	16:37:01	Insert into BorrowingRecords (BORROW_ID, MEMBER_ID, BOOK_ID, BORROW_DATE, RE...	7 row(s) affected Records: 7 Duplicates: 0 Warnings: 0	0.015 sec

## 1.3: Information Retrieval

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

```

71 # 1.3 A) Retrieve a list of books currently borrowed by a specific member.
72
73 • select b.book_id,m.Name as Borrowed_by,bk.TITLE as list_of_books
74 from BorrowingRecords b
75 join books bk on b.BOOK_ID = bk.BOOK_ID
76 join Members m on b.MEMBER_ID = m.MEMBER_ID
77 order by b.book_id asc;

```

Result Grid   Filter Rows:  | Export:  | Wrap Cell Content: 

	book_id	Borrowed_by	list_of_books
▶	111	Praveen	Pride and Prejudice
	121	Shrinath	The Guide
	121	Vignesh	The Guide
	141	Vignesh	Suitable Boy
	141	Shankar	Suitable Boy
	151	Kamaraj	THE SILENT PATIENT
	171	Mukesh	The Lord of the Rings

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

```

79 #1.3 B)Find members who have overdue books (borrowed more than 30 days ago, not returned)
80
81 • select bk.TITLE, M.Name,DATEDIFF (b.RETURN_DATE,b.BORROW_DATE) as Overdue_by
82 from BorrowingRecords b
83 join Members M on b.MEMBER_ID = m.MEMBER_ID
84 join books bk on b.BOOK_ID = bk.BOOK_ID
85 where DATEDIFF (b.RETURN_DATE,b.BORROW_DATE) > 30
86 ORDER BY Overdue_by DESC;

```

Result Grid   Filter Rows:  | Export:  | Wrap Cell Content: 





	TITLE	Name	Overdue_by
▶	The Lord of the Rings	Mukesh	94
	Suitable Boy	Shankar	72
	THE SILENT PATIENT	Kamaraj	66
	Pride and Prejudice	Praveen	61
	Suitable Boy	Vignesh	56

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

```

88 #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
91 FROM Books
92 GROUP BY Genre
93 ORDER BY count_of_available_copies DESC ;

```

Result Grid   Filter Rows:  | Export:  | Wrap Cell Content: 

	Genre	count_of_available_copies
▶	Thriller	51
	Fantasy	39
	Drama	34
	Humor	25
	Fiction	22
	Psychological	5

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

```

95 #1.3 d) Find the most borrowed book(s) overall.
96
97 • select bk.Title,count(b.book_id) as Borrow_Count
98 from BorrowingRecords b
99 join books bk on B.book_id = BK.book_id
100 group by b.book_id
101 ORDER BY Borrow_Count DESC;

```

Result Grid | Filter Rows:  | Export: | Wrap Cell Content:

	Title	Borrow_Count
▶	The Guide	2
	Suitable Boy	2
	Pride and Prejudice	1
	THE SILENT PATIENT	1
	The Lord of the Rings	1

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

```

103 #1.3 e) Retrieve members who have borrowed books from at least three different genres.
104
105 • select m.Name,M.Member_id
106 from members m
107 join BorrowingRecords b on M.MEMBER_ID = B.MEMBER_ID
108 JOIN Books as Bk ON B.book_id = Bk.book_id
109 group by m.Name,M.Member_id
110 having count(DISTINCT bk.genre)>=3;

```

Result Grid | Filter Rows:  | Export: | Wrap Cell Content:

	Name	Member_id
--	------	-----------

## 1.4 Reporting and Analytics:

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

```

112 # Reporting and Analytics:
113 # a) Calculate the total number of books borrowed per month.
114
115 • SELECT DATE_FORMAT(Borrow_date, '%Y-%m') AS Borrow_month, COUNT(*) AS Total_books_borrowed
116 FROM BorrowingRecords b
117 GROUP BY Borrow_month
118 ORDER BY Total_books_borrowed desc;

```

Result Grid | Filter Rows:  | Export: | Wrap Cell Content:

	Borrow_month	Total_books_borrowed
▶	2025-04	3
	2025-05	1
	2025-06	1
	2025-03	1
	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
124 join BorrowingRecords b on M.MEMBER_ID = B.MEMBER_ID
125 join books bk on bk.book_id = b.book_id
126 group by M.name
127 order by Number_of_books_borrowed desc
128 limit 3;

```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
	Name	Number_of_books_borrowed			
▶	Vignesh	2			
	Shankar	1			
	Mukesh	1			

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

```

130 #1.4 C, Retrieve authors whose books have been borrowed at least 10 times.
131
132 • Select Bk.AUTHOR,count(b.book_id) as Number_of_books_borrowed
133 from books bk
134 Join BorrowingRecords b on bk.book_id = b.book_id
135 group by b.book_id
136 HAVING COUNT(b.book_id) >= 10;

```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	AUTHOR	Number_of_books_borrowed		

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

```

138 #1.4 d)#Identify members who have never borrowed a book.
139
140 • select M.Name
141 from members m
142 left Join BorrowingRecords b on M.MEMBER_ID = B.MEMBER_ID
143 where b.borrow_id is Null;

```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	Name			
▶	Vimalrka			

