SCREENSHOTS OF SQL TABLES :

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

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	bk	NULL	ALL	PRIMARY	NULL	NULL	NULL	4	25.00	Using where
1	SIMPLE	b	NULL	ref	Book_ID,Member_ID	Book_ID	5	management.bk.Book_ID	1	100.00	Using where
1	SIMPLE	m	NULL	eq_ref	PRIMARY	PRIMARY	4	management.b.Member_ID	1	100.00	NULL

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

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	bk	NULL	index	PRIMARY	idx_book_title	802	NULL	4	25.00	Using where; Using index
1	SIMPLE	b	NULL	ref	idx_borrow_memberid,idx_borrow_bookid	idx_borrow_bookid	5	management.bk.Book_ID	1	100.00	Using where
1	SIMPLE	m	NULL	eq_ref	PRIMARY	PRIMARY	4	management.b.Member_ID	1	100.00	NULL

Result Grid | Filter Rows:

Title	Author
Atomic Habits	James Clear
Python Programming	John Zelle
The Time Machine	H.G. Wells
World History	J. Warner

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

id	select_type	table	partitions	type	possible_keys	key	key_len	ref	rows	filtered	Extra
1	SIMPLE	b	NULL	index	idx_borrow_memberid	idx_borrow_memberid	5	NULL	3	100.00	Using where; Using index; Using temporary
1	SIMPLE	m	NULL	eq_ref	PRIMARY,idx_member_name	PRIMARY	4	management.b.Member_ID	1	100.00	NULL

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

Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
book	0	PRIMARY	1	Book_ID	A	4	NULL	NULL		BTREE			YES	NULL
book	0	ISBN	1	ISBN	A	4	NULL	NULL	YES	BTREE			YES	NULL
book	1	Publisher_ID	1	Publisher_ID	A	3	NULL	NULL	YES	BTREE			YES	NULL
book	1	idx_book_title	1	Title	A	4	NULL	NULL		BTREE			YES	NULL

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

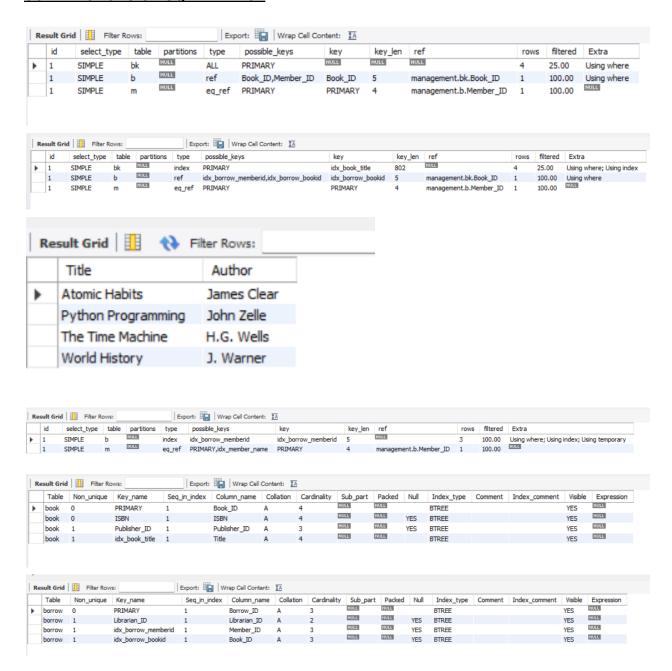| Table	Non_unique	Key_name	Seq_in_index	Column_name	Collation	Cardinality	Sub_part	Packed	Null	Index_type	Comment	Index_comment	Visible	Expression
borrow	0	PRIMARY	1	Borrow_ID	A	3	NULL	NULL		BTREE			YES	NULL
borrow	1	Librarian_ID	1	Librarian_ID	A	2	NULL	NULL	YES	BTREE			YES	NULL
borrow	1	idx_borrow_memberid	1	Member_ID	A	3	NULL	NULL	YES	BTREE			YES	NULL
borrow	1	idx_borrow_bookid	1	Book_ID	A	3	NULL	NULL	YES	BTREE			YES	NULL

EXPLANATION :

The Performance Optimization task improves the efficiency of database operations using indexes and query analysis.

By applying the EXPLAIN command before and after indexing, query performance was measured and optimized.

Indexes were added to frequently accessed columns like Book.Title, Member.Name, and Borrow.Member_ID, which significantly reduced query execution time.

This ensures faster data retrieval and enhances the scalability of the Library Management System.