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BSCpe 3A

Laboratory Activity 4:

Laboratory Title: SQL - JOIN Operation

Chapter No. and Topic: Chapter 2 - Structured Query Language (SQL)

Discussions:

This activity introduces students to SQL JOIN operations for combining data from multiple tables.

Activity Description:

Learn how to use INNER JOIN, LEFT JOIN, and RIGHT JOIN to combine tables.

Objectives:

- Write SQL JOIN queries to retrieve data from multiple tables.
- Use INNER JOIN, LEFT JOIN, and RIGHT JOIN.

Materials:

- MySQL Workbench or SQL client

Procedure:

1. Retrieve a list of all transactions, including book title and member name:

sql

Copy code

```
SELECT Books.Title, Members.FirstName, Members.LastName
```

```
FROM Transactions
```

```
INNER JOIN Books ON Transactions.BookID = Books.BookID
```

```
INNER JOIN Members ON Transactions.MemberID = Members.MemberID;
```

The screenshot shows the MySQL Workbench interface. The query editor contains the following SQL:

```

1 SELECT Books.Title, Members.FirstName, Members.LastName
2 FROM Transactions
3 INNER JOIN Books ON Transactions.BookID = Books.BookID
4 INNER JOIN Members ON Transactions.MemberID = Members.MemberID;
5

```

The result grid displays the following data:

Title	FirstName	LastName
The Great Gatsby	John	Doe
To Kill a Mockingbird	Jane	Smith
1984	Michael	Johnson
Pride and Prejudice	Emily	Davis
Moby Dick	David	Brown
War and Peace	Sarah	Williams
The Odyssey	James	Jones
The Catcher in the Rye	Patricia	Garcia
The Lord of the Rings	Robert	Miller
Brave New World	Mary	Wilson
Frankenstein	William	Moore
Dracula	Linda	Taylor
The Picture of Dorian ...	Thomas	Anderson
Crime and Punishment	Jessica	Thomas
The Hobbit	Christopher	Jackson
The Great Alone	Amanda	White
The Shining	Joshua	Harris
The Alchemist	Elizabeth	Martin
The Hunger Games	Andrew	Thompson
The Kite Runner	Kimberly	Garcia
A Game of Thrones	Steven	Martinez
The Chronicles of Narnia	Nicole	Roberts
Little Women	Brian	Walker
Anna Karenina	Angela	Scott
The Book Thief	Joseph	Young

The output pane shows the execution log:

#	Time	Action	Message
36	11:07:31	SELECT * FROM librarymanagement.transactions LIMIT 0, 1000	0 row(s) returned
37	11:07:31	INSERT INTO Transactions (MemberID, BookID, IssueDate, ReturnDate) VALUES (1, 1, '2025-01-10', '2025-01-17'), (2, 2, '2025-01-12', '2025-01-19') ...	45 row(s) affected Records: 45 Duplicates: 0 Warnings: 0
38	11:10:51	SELECT * FROM Books LIMIT 0, 1000	154 row(s) returned
39	11:12:06	SELECT * FROM Books WHERE Genre = 'Fiction' LIMIT 0, 1000	4 row(s) returned
40	11:13:05	SELECT * FROM Books ORDER BY Title ASC LIMIT 0, 1000	154 row(s) returned

1. Retrieve a list of all books with transaction details, even those without transactions (LEFT JOIN):

sql

Copy code

SELECT Books.Title, Members.FirstName, Members.LastName

FROM Books

LEFT JOIN Transactions ON Books.BookID = Transactions.BookID

LEFT JOIN Members ON Transactions.MemberID = Members.MemberID;

The screenshot displays the MySQL Workbench interface. The 'Query' tab is active, showing a SQL query that uses `LEFT JOIN` to combine data from the `Books`, `Transactions`, and `Members` tables. The query is as follows:

```

1 SELECT Books.Title, Members.FirstName, Members.LastName
2 FROM Books
3 LEFT JOIN Transactions ON Books.BookID = Transactions.BookID
4 LEFT JOIN Members ON Transactions.MemberID = Members.MemberID;
5

```

The 'Result Grid' shows the output of the query, displaying columns `Title`, `FirstName`, and `LastName`. The results list various book titles and the names of the members who have borrowed them.

Title	FirstName	LastName
The Great Gatsby	John	Doe
To Kill a Mockingbird	Jane	Smith
1984	Michael	Johnson
Pride and Prejudice	Emily	Davis
Moby Dick	David	Brown
War and Peace	Sarah	Williams
The Odyssey	James	Jones
The Catcher in the Rye	Patricia	Garcia
The Lord of the Rings	Robert	Miller
Brave New World	Mary	Wilson
Frankenstein	William	Moore
Dracula	Linda	Taylor
The Picture of Dorian ...	Thomas	Anderson
Crime and Punishment	Jessica	Thomas
The Hobbit	Christopher	Jackson
The Great Alone	Amanda	White
The Shining	Joshua	Harris
The Alchemist	Elizabeth	Martin
The Hunger Games	Andrew	Thompson
The Kite Runner	Kimberly	Garcia
A Game of Thrones	Steven	Martinez
The Chronicles of Narnia	Nicole	Roberts
Little Women	Brian	Walker
Anna Karenina	Angela	Scott
The Book Thief	Joseph	Young

The 'Output' tab at the bottom shows the execution log, including the query execution time and the number of rows returned for each step.

Result:

JOIN operations linking tables to retrieve combined data.

Additional Questions/Discussions:

- How does the `LEFT JOIN` differ from the `INNER JOIN`?

The `LEFT JOIN` returns all records from the left table and the matching records from the right table, while the `INNER JOIN` only returns records that have matching values in both tables, excluding non-matching rows from the result.

Conclusions: SQL - JOIN Operation emphasizes the importance of combining data from multiple tables using different join types, enabling more comprehensive and efficient data retrieval in relational databases.