Hotwax Training

Assignment Day 2

TASK 1: What is InnoDB?

InnoDB is a default storage engine used by MySQL.MySQL uses this storage engine to store the data in the form of tables, which is the most powerful and commonly used one.

Features :
- **Transactions:** Provides an option to group the multiple queries and execute simultaneously.
- **ACID compliant:** Follows the four fundamental properties (Atomicity, Consistency, Isolation, Durability) for storing and managing the data efficiently.
- **Row-level locking:** It only locks the row to be updated, not the whole table like MYISAM.
- **Crash recovery:** Automatically recovers crashes of data using log files.
- **Auto-indexing:** InnoDB always stores data tables in the form of clustered indexes, on which primary key helps in fast searching.

TASK 2: Differentiate Temporal Data-types in MySQL.

Data-type	Description	Example
DATE	Stores only the date in the 'yyyy-mm-dd' format.	**'2023-09-01'**
TIME	Stores only time in 'hours:minutes:seconds'	**'13:15:30'**
DATETIME	Stores the date and time both in the format 'yyyy-mm-dd hours:minutes:seconds'	**'2016-12-08 12:34:45'**
YEAR	Stores the year only in two or four digits format	**'2025'**
TIMESTAMP	Similar to DATETIME but used to track changes or events. It stores the real/current time of the server or system.	**'2016-12-08 12:34:45'**

TASK 3: TCL IN DBMS?

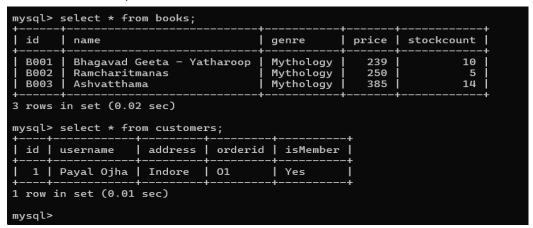TCL is called the Transaction Control Language, used to control transactions in SQL.

TCL COMMANDS:
- **COMMIT:** To permanently save the changes.
- **ROLLBACK:** To undo the recent change.
- **SAVEPOINT:** To create a savepoint with some name after the desired transaction, to which the changes can be rolled back.
- **SET TRANSACTION:** To set the isolation level of the transaction.

TASK 4: 20 COMMANDS FOR DDL, 20 FOR DML AND 20 FOR DQL.

SCENARIO : We are creating the database for an online bookstore and will perform the various queries on it.

1. CREATE DATABASE bookstore;
2. CREATE TABLE books(id varchar(5) PRIMARY KEY, name VARCHAR(255), genere VARCHAR(100), price int);
3. CREATE TABLE customers(id int primary key, username varchar(100), address varchar(200), orderid varchar(10) DEFAULT NULL, isMember ENUM('Yes', 'No'));
4. INSERT INTO books(id, name, genere, price) VALUES ('B001', 'Bhagavad Geeta - Yatharoop', 'Mythology', 239), ('B002', 'Ramcharitmanas', 'Mythology', 250), ('B003', 'Ashvatthama', 'Mythology', 385);
5. ALTER TABLE books RENAME COLUMN genere TO genre;
6. ALTER TABLE books ADD COLUMN stockcount int;
7. UPDATE books SET stockcount = 10 WHERE id='B001';
8. UPDATE books SET stockcount = 05 WHERE id='B002';
9. UPDATE books SET stockcount = 14 WHERE id='B003';
10. INSERT INTO customers (id, username,address, orderid, isMember) VALUES (01, 'Payal Ojha', 'Indore', 'O1', 'Yes');
11. select * from customers;
12. select * from books;

```
mysql> select * from books;
+------+----------------------------+-----------+-------+------------+
| id   | name                       | genre     | price | stockcount |
+------+----------------------------+-----------+-------+------------+
| B001 | Bhagavad Geeta - Yatharoop | Mythology |   239 |         10 |
| B002 | Ramcharitmanas             | Mythology |   250 |          5 |
| B003 | Ashvatthama                | Mythology |   385 |         14 |
+------+----------------------------+-----------+-------+------------+
3 rows in set (0.02 sec)

mysql> select * from customers;
+----+------------+---------+---------+----------+
| id | username   | address | orderid | isMember |
+----+------------+---------+---------+----------+
|  1 | Payal Ojha | Indore  | O1      | Yes      |
+----+------------+---------+---------+----------+
1 row in set (0.01 sec)

mysql>
```

13. create table authors (auth_id varchar(4) PRIMARY KEY, author_name varchar(200), book_id varchar(5), FOREIGN KEY(book_id) references books (id));
14. insert into books (id, name, genre, price, stockcount) values ('B004', 'iRobot', 'Science fiction', 780, 6), ('B005', 'Star Dust', 'Science Fiction', 579, 9);
15. select * from books;

```
mysql> select * from books;
+------+----------------------------+----------------+-------+------------+
| id   | name                       | genre          | price | stockcount |
+------+----------------------------+----------------+-------+------------+
| B001 | Bhagavad Geeta - Yatharoop | Mythology      |   239 |         10 |
| B002 | Ramcharitmanas             | Mythology      |   250 |          5 |
| B003 | Ashvatthama                | Mythology      |   385 |         14 |
| B004 | iRobot                     | Science fiction|   780 |          6 |
| B005 | Star Dust                  | Science Fiction|   579 |          9 |
+------+----------------------------+----------------+-------+------------+
5 rows in set (0.00 sec)
```

16. insert into authors (auth_id, author_name, book_id) values ('A001', 'Kat Thomas', 'B005');
17. insert into authors (auth_id, author_name, book_id) values ('A002', 'Wuraola', 'B004'), ('A003', 'Tulsi Das', 'B002'), ('A004', 'A.C. Bhaktivendanta Swami Prabhupada', 'B001');
18. ALTER TABLE books ADD edition varchar(10), ADD language varchar(20);
19. UPDATE books SET language='HINDI' where genre='Mythology';
20. UPDATE books SET language='English' where genre='Science fiction';
21. Select * from books;

```
mysql> UPDATE books SET language='English' where genre='Science fiction';
Query OK, 2 rows affected (0.02 sec)
Rows matched: 2  Changed: 2  Warnings: 0

mysql> select * from books;
+------+----------------------------+----------------+-------+------------+---------+----------+
| id   | name                       | genre          | price | stockcount | edition | language |
+------+----------------------------+----------------+-------+------------+---------+----------+
| B001 | Bhagavad Geeta - Yatharoop | Mythology      |   239 |         10 | NULL    | HINDI    |
| B002 | Ramcharitmanas             | Mythology      |   250 |          5 | NULL    | HINDI    |
| B003 | Ashvatthama                | Mythology      |   385 |         14 | NULL    | HINDI    |
| B004 | iRobot                     | Science fiction|   780 |          6 | NULL    | English  |
| B005 | Star Dust                  | Science Fiction|   579 |          9 | NULL    | English  |
+------+----------------------------+----------------+-------+------------+---------+----------+
5 rows in set (0.00 sec)
```

22. create table orders(orderid int Primary key, ordered_book_id varchar(4), No_Of_Copies_Sold int, customer_id int);
23. insert into customers (id, username, address, orderid) values (02, 'Shashikala mukharjee', 'Raipur', 1001);
24. ALTER TABLE customers MODIFY COLUMN id INT AUTO_INCREMENT;

```
mysql> desc customers;
+----------+-----------------+------+-----+---------+----------------+
| Field    | Type            | Null | Key | Default | Extra          |
+----------+-----------------+------+-----+---------+----------------+
| id       | int             | NO   | PRI | NULL    | auto_increment |
| username | varchar(100)    | YES  |     | NULL    |                |
| address  | varchar(200)    | YES  |     | NULL    |                |
| orderid  | varchar(10)     | YES  |     | NULL    |                |
| isMember | enum('Yes','No')| YES  |     | NULL    |                |
+----------+-----------------+------+-----+---------+----------------+
5 rows in set (0.05 sec)
```

25. insert into orders (orderid, ordered_book_id, No_Of_Copies_Sold, customer_id) values (01, 'B001', 2, 001);
26. insert into orders (orderid, ordered_book_id, No_Of_Copies_Sold, customer_id) values (02, 'B004', 1, 002), (03, 'B002', 1, 003);
27. UPDATE orders SET orderid = 1001 WHERE orderid=1;
28. UPDATE orders SET orderid = 1002 WHERE orderid=2;
29. UPDATE orders SET orderid = 1003 WHERE orderid=3;
30. UPDATE customers SET orderid=1002 WHERE id=1;

```
mysql> select * from customers;
+----+----------------------+---------+---------+----------+
| id | username             | address | orderid | isMember |
+----+----------------------+---------+---------+----------+
|  1 | Payal Ojha           | Indore  | 1002    | Yes      |
|  2 | Shashikala mukharjee | Raipur  | 1001    | NULL     |
+----+----------------------+---------+---------+----------+
2 rows in set (0.00 sec)

mysql> select * from orders;
+---------+-----------------+-------------------+-------------+
| orderid | ordered_book_id | No_Of_Copies_Sold | customer_id |
+---------+-----------------+-------------------+-------------+
|    1001 | B001            |                 2 |           1 |
|    1002 | B004            |                 1 |           2 |
|    1003 | B002            |                 1 |           3 |
+---------+-----------------+-------------------+-------------+
3 rows in set (0.00 sec)
```

31. ALTER TABLE orders ADD order_date_time DATETIME;
32. UPDATE orders SET order_date_time="2015-02-24 23:45:30" WHERE orderid=1001;
33. UPDATE orders SET order_date_time="2015-02-24 12:35:27" WHERE orderid=1002;
34. UPDATE orders SET order_date_time="2015-02-24 09:55:29" WHERE orderid=1003;

35. Select * from orders;

```
mysql> select * from orders;
+---------+-----------------+------------------+-------------+---------------------+
| orderid | ordered_book_id | No_Of_Copies_Sold | customer_id | order_date_time     |
+---------+-----------------+------------------+-------------+---------------------+
|    1001 | B001            |                2 |           1 | 2015-02-24 23:45:30 |
|    1002 | B004            |                1 |           2 | 2015-02-24 12:35:27 |
|    1003 | B002            |                1 |           3 | 2015-02-24 09:55:29 |
+---------+-----------------+------------------+-------------+---------------------+
3 rows in set (0.00 sec)
```

36. ALTER TABLE orders RENAME COLUMN No_Of_Copies_Sold TO Sold_Copy_Count;
37. INSERT INTO books (id, name, genre, price, stockcount) VALUES ('B006', 'To Kill a
    Mockingbird', 'Classic Literature', 450, 12), ('B007', 'The Silent Patient', 'Thriller', 520, 8),
    ('B008', 'Atomic Habits', 'Self-help', 399, 15), ('B009', 'The Midnight Library', 'Fantasy', 610, 7),
    ('B010', 'The Martian', 'Science Fiction', 720, 5);

```
mysql> select * from books;
+------+--------------------------+--------------------+-------+------------+---------+----------+
| id   | name                     | genre              | price | stockcount | edition | language |
+------+--------------------------+--------------------+-------+------------+---------+----------+
| B001 | Bhagavad Geeta - Yatharoop | Mythology        |   239 |         10 | NULL    | HINDI    |
| B002 | Ramcharitmanas           | Mythology          |   250 |          5 | NULL    | HINDI    |
| B003 | Ashvatthama              | Mythology          |   385 |         14 | NULL    | HINDI    |
| B004 | iRobot                   | Science fiction    |   780 |          6 | NULL    | English  |
| B005 | Star Dust                | Science Fiction    |   579 |          9 | NULL    | English  |
| B006 | To Kill a Mockingbird    | Classic Literature |   450 |         12 | NULL    | NULL     |
| B007 | The Silent Patient       | Thriller           |   520 |          8 | NULL    | NULL     |
| B008 | Atomic Habits            | Self-help          |   399 |         15 | NULL    | NULL     |
| B009 | The Midnight Library     | Fantasy            |   610 |          7 | NULL    | NULL     |
| B010 | The Martian              | Science Fiction    |   720 |          5 | NULL    | NULL     |
+------+--------------------------+--------------------+-------+------------+---------+----------+
10 rows in set (0.00 sec)
```

38. UPDATE books SET edition = '1st', language = 'Hindi' WHERE id IN ('B001', 'B002',
    'B003');
39. UPDATE books SET edition = '2nd', language = 'English' WHERE id IN ('B004', 'B005',
    'B010');
40. UPDATE books SET edition = '1st', language = 'English' WHERE id = 'B006';
41. UPDATE books SET edition = '1st', language = 'English' WHERE id = 'B007';
42. UPDATE books SET edition = '3rd', language = 'English' WHERE id = 'B008';
43. UPDATE books SET edition = '1st', language = 'English' WHERE id = 'B009';
44. Select * from books;

```
mysql> select * from books;
+------+-------------------------+--------------------+-------+------------+---------+----------+
| id   | name                    | genre              | price | stockcount | edition | language |
+------+-------------------------+--------------------+-------+------------+---------+----------+
| B001 | Bhagavad Geeta - Yatharoop | Mythology        |   239 |         10 | 1st     | Hindi    |
| B002 | Ramcharitmanas          | Mythology          |   250 |          5 | 1st     | Hindi    |
| B003 | Ashvatthama             | Mythology          |   385 |         14 | 1st     | Hindi    |
| B004 | iRobot                  | Science fiction    |   780 |          6 | 2nd     | English  |
| B005 | Star Dust               | Science Fiction    |   579 |          9 | 2nd     | English  |
| B006 | To Kill a Mockingbird   | Classic Literature |   450 |         12 | 1st     | English  |
| B007 | The Silent Patient      | Thriller           |   520 |          8 | 1st     | English  |
| B008 | Atomic Habits           | Self-help          |   399 |         15 | 3rd     | English  |
| B009 | The Midnight Library    | Fantasy            |   610 |          7 | 1st     | English  |
| B010 | The Martian             | Science Fiction    |   720 |          5 | 2nd     | English  |
+------+-------------------------+--------------------+-------+------------+---------+----------+
10 rows in set (0.01 sec)
```

45. delete from books WHERE id=B010;
46. SAVEPOINT S1;
47. CREATE TABLE payments (customer_id int, paid_amount int ,payment_mode
     varchar(20), payment_status enum('success','pending','cancelled'),
     payment_time_and_date DATETIME, ratings int);
48. INSERT INTO payments (customer_id, paid_amount, payment_mode, payment_status,
     payment_time_and_date, ratings) VALUES (1, 478, 'Credit Card', 'success', '2015-02-24
     23:50:00', 5), (2, 780, 'UPI', 'success', '2015-02-24 12:40:00', 4), (3, 250, 'Cash',
     'pending', '2015-02-24 10:00:00', 3);

```
mysql> select * from payments;
+-------------+-------------+--------------+----------------+-----------------------+---------+
| customer_id | paid_amount | payment_mode | payment_status | payment_time_and_date | ratings |
+-------------+-------------+--------------+----------------+-----------------------+---------+
|           1 |         478 | Credit Card  | success        | 2015-02-24 23:50:00   |       5 |
|           2 |         780 | UPI          | success        | 2015-02-24 12:40:00   |       4 |
|           3 |         250 | Cash         | pending        | 2015-02-24 10:00:00   |       3 |
+-------------+-------------+--------------+----------------+-----------------------+---------+
3 rows in set (0.00 sec)
```

49. ALTER TABLE payments DROP COLUMN payment_time_and_date;

```
mysql> select * from payments;
+-------------+-------------+--------------+----------------+---------+
| customer_id | paid_amount | payment_mode | payment_status | ratings |
+-------------+-------------+--------------+----------------+---------+
|           1 |         478 | Credit Card  | success        |       5 |
|           2 |         780 | UPI          | success        |       4 |
|           3 |         250 | Cash         | pending        |       3 |
+-------------+-------------+--------------+----------------+---------+
3 rows in set (0.01 sec)
```

50. SELECT * FROM orders NATURAL JOIN payments

```
mysql> SELECT * FROM orders NATURAL JOIN payments;
+-------------+---------+-----------------+-----------------+---------------------+-------------+--------------+----------------+---------+
| customer_id | orderid | ordered_book_id | Sold_Copy_Count | order_date_time     | paid_amount | payment_mode | payment_status | ratings |
+-------------+---------+-----------------+-----------------+---------------------+-------------+--------------+----------------+---------+
|           1 |    1001 | B001            |               2 | 2015-02-24 23:45:30 |         478 | Credit Card  | success        |       5 |
|           2 |    1002 | B004            |               1 | 2015-02-24 12:35:27 |         780 | UPI          | success        |       4 |
|           3 |    1003 | B002            |               1 | 2015-02-24 09:55:29 |         250 | Cash         | pending        |       3 |
+-------------+---------+-----------------+-----------------+---------------------+-------------+--------------+----------------+---------+
3 rows in set (0.02 sec)
```

51. SELECT * FROM authors AS a JOIN books AS b WHERE a.book_id = b.id;

```
mysql> SELECT * FROM authors AS a JOIN books AS b WHERE a.book_id = b.id;
+---------+-----------------------------------+---------+------+-----------------------------+-----------------+-------+------------+---------+----------+
| auth_id | author_name                       | book_id | id   | name                        | genre           | price | stockcount | edition | language |
+---------+-----------------------------------+---------+------+-----------------------------+-----------------+-------+------------+---------+----------+
| A001    | Kat Thomas                        | B005    | B005 | Star Dust                   | Science Fiction |   579 |          9 | 2nd     | English  |
| A002    | Wuraola                           | B004    | B004 | iRobot                      | Science fiction |   780 |          6 | 2nd     | English  |
| A003    | Tulsi Das                         | B002    | B002 | Ramcharitmanas              | Mythology       |   250 |          5 | 1st     | Hindi    |
| A004    | A.C. Bhaktivendanta Swami Prabhupada | B001 | B001 | Bhagavad Geeta - Yatharoop  | Mythology       |   239 |         10 | 1st     | Hindi    |
+---------+-----------------------------------+---------+------+-----------------------------+-----------------+-------+------------+---------+----------+
4 rows in set (0.02 sec)
```

52. COMMIT;
53. SELECT * FROM customers as c LEFT JOIN orders as o ON c.orderid=o.orderid;

```
mysql> SELECT * FROM customers as c LEFT JOIN orders as o ON c.orderid=o.orderid;
+----+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
| id | username            | address | orderid | isMember | orderid | ordered_book_id | Sold_Copy_Count | customer_id | order_date_time     |
+----+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
|  1 | Payal Ojha          | Indore  | 1002    | Yes      | 1002    | B004            |                 |           1 |           2 | 2015-02-24 12:35:27 |
|  2 | Shashikala mukharjee | Raipur | 1001    | NULL     | 1001    | B001            |                 |           2 |           1 | 2015-02-24 23:45:30 |
+----+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
2 rows in set (0.02 sec)
```

54. SELECT * FROM customers as c RIGHT JOIN orders as o ON c.orderid=o.orderid;

```
mysql> SELECT * FROM customers as c RIGHT JOIN orders as o ON c.orderid=o.orderid;
+------+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
| id   | username            | address | orderid | isMember | orderid | ordered_book_id | Sold_Copy_Count | customer_id | order_date_time     |
+------+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
|    2 | Shashikala mukharjee | Raipur | 1001    | NULL     | 1001    | B001            |               2 |           1 | 2015-02-24 23:45:30 |
|    1 | Payal Ojha          | Indore  | 1002    | Yes      | 1002    | B004            |               1 |           2 | 2015-02-24 12:35:27 |
| NULL | NULL                | NULL    | NULL    | NULL     | 1003    | B002            |               1 |           3 | 2015-02-24 09:55:29 |
+------+---------------------+---------+---------+----------+---------+-----------------+-----------------+-------------+---------------------+
3 rows in set (0.00 sec)
```

55. SELECT b.genre, SUM(o.Sold_Copy_Count) AS total_sold FROM orders AS o JOIN
     books AS b ON o.ordered_book_id=b.id GROUP BY b.genre HAVING total_sold>=2;

```
mysql> SELECT b.genre, SUM(o.Sold_Co
;
+--------------+--------------+
| genre        | total_sold   |
+--------------+--------------+
| Mythology    |           3  |
+--------------+--------------+
1 row in set (0.03 sec)
```

56. SELECT payment_mode, COUNT(*) AS total_payments FROM payments GROUP BY payment_mode HAVING total_payments=1;

```
mysql> SELECT payment_mode, COUNT(*) AS total_payments FROM payments GROUP BY payment_mode HAVING total_payments=1;
+--------------+----------------+
| payment_mode | total_payments |
+--------------+----------------+
| Credit Card  |              1 |
| UPI          |              1 |
| Cash         |              1 |
+--------------+----------------+
3 rows in set (0.00 sec)
```

57. SELECT c.id, SUM(p.paid_amount) AS total_spent FROM payments AS p JOIN customers AS c ON p.customer_id=c.id GROUP BY c.id HAVING total_spent>500;

```
mysql> SELECT c.id, SUM(p.paid_amo
 BY c.id HAVING total_spent>500;
+----+-------------+
| id | total_spent |
+----+-------------+
|  2 |         780 |
+----+-------------+
1 row in set (0.00 sec)
```

58. SELECT genre, AVG(price) AS avg_price FROM books GROUP BY genre;

```
mysql> SELECT genre, AVG(price) AS avg_price FROM books GROUP BY genre;
+--------------------+-----------+
| genre              | avg_price |
+--------------------+-----------+
| Mythology          |  291.3333 |
| Science fiction    |  679.5000 |
| Classic Literature |  450.0000 |
| Thriller           |  520.0000 |
| Self-help          |  399.0000 |
| Fantasy            |  610.0000 |
+--------------------+-----------+
6 rows in set (0.02 sec)
```

59. SAVEPOINT S2;
60. TRUNCATE authors;
61. select * from authors;

```
mysql> SAVEPOINT S2;
Query OK, 0 rows affected (0.01 sec)

mysql> TRUNCATE authors;
Query OK, 0 rows affected (0.12 sec)

mysql> select * from authors;
Empty set (0.02 sec)
```

DOUBT :

```
mysql> ROLLBACK TO S2;
ERROR 1305 (42000): SAVEPOINT S2 does not exist
mysql> ROLLBACK TO SAVEPOINT S2;
ERROR 1305 (42000): SAVEPOINT S2 does not exist
mysql>
```