# **Assignment-8**

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Assignment 1: Write a SELECT query to retrieve all columns from a 'customers' table, and modify it to return only the customer name and email address for customers in a specific city.

Query 1: Retrieve all columns from the 'customers' table

SELECT \* FROM customers;

Query 2: Retrieve customer name and email address for customers in a specific city.

SELECT Fname, Lname, email FROM customers WHERE city = 'chennai';

```
mysql> show tables;
 Tables_in_librarymanagement |
 accounts
 authors
 books
 borrowedbooks
 customers
 members
 products
7 rows in set (0.01 sec)
mysql> desc customers;
 Field Type
                      | Null | Key | Default | Extra |
 cust id | int
                       NO
                             | PRI |
                                    NULL
 Fname
          varchar(15)
                       NO
                                    NULL
          varchar(15)
                        NO
                                    NULL
 Lname
 email
           varchar(50)
                        NO
                                    NULL
         | varchar(30) | YES
 city
                                    NULL
5 rows in set (0.01 sec)
mysql> select * from customers;
```

```
mysql> select * from customers;
           Fname | Lname
                           email
                                             city
 cust id |
       1 |
           Jonh
                   gon
                           jonh@example.com | hyd
                   simth |
       2
           rose
                           rose@example.com
                                               chennai
                 | jerry | tom@example.com
        3
                                              Delhi
3 rows in set (0.00 sec)
mysql> select fname , email from customers where city = 'chennai';
 fname | email
 rose rose@example.com
1 row in set (0.00 sec)
mysql> select fname ,lname, email from customers where city = 'chennai';
 fname | lname | email
        | simth | rose@example.com |
 rose
1 row in set (0.00 sec)
mysql> _
```

Assignment 2: Craft a query using an INNER JOIN to combine 'orders' and 'customers' tables for customers in a specified region, and a LEFT JOIN to display all customers including those without orders.

Here I have create employee table and dept table.

Inserted some records into employee table and dept table.

```
mysql> select * from products;
 pid |
       pname
                 price
                             DOP
                                         Brand
       mobile
                  15000.00
                             2024-05-21
                                           iphone
       laptop
                  25000.00
                              2024-05-21
                                           del1
                   1200.00
                              2024-05-21
                                           blackBook
   3
       books
   4
       toys
                    1500.00
                              2024-05-20
                                           Kidszee
                   3000.00
                             NULL
                                           Dell
       keyboard
 rows in set (0.00 sec)
mysql> select * from dept;
 DNo | Dname
                    Location
       Development |
                     Hyderabad
  10
       Testing
  20
                     Banglore
  30
       operation
                     Mumbai
  40
       Research
                     Chennai
  50
                     Delhi
       sales
 rows in set (0.00 sec)
```

#### **Inner Join:**

Select eid,ename,Salary,job,d.dno,dname,location from employee E INNER JOIN Dept D where E.dno = D.dno;

Select eid,ename,Salary,job,d.dno,dname,location from employee E INNER JOIN Dept D where E.dno!= D.dno;

colony									
Salary	job	dno	dname	location					
	President Manager Manager Developer Developer Tester Tester Analayst	40   10   20   10   10   20   20   30	Research Development Testing Development Development Testing Testing operation	Chennai Hyderabad Banglore Hyderabad Hyderabad Banglore Banglore Mumbai					
mysql> select eid,ename, salary,job,d.dno,dname, location from employee E INNER JOIN Dept D where E.dno != D.dno;									
salary	job	dno	dname	location					
50000.00   50000.00   50000.00   50000.00   45000.00	President President President President Manager	50   30   20   10	sales operation Testing Development sales	Delhi Mumbai Banglore Hyderabad ACtivate Windows Delhi Go to Settins to activate Windows.					
	45000.00   40000.00   30000.00   35000.00   25000.00   47000.00   eid,ename, sere E.dno != salary   50000.00   50000.00   50000.00	50000.00   President   45000.00   Manager   40000.00   Manager   30000.00   Developer   35000.00   Tester   22000.00   Tester   47000.00   Analayst   47000.00   Analayst   47000.00   Analayst   50000.00   President   500000.00   President   50000.00   President   500000.00   President   500000.00   President   500000.	50000.00   President   40   45000.00   Manager   10   40000.00   Manager   20   30000.00   Developer   10   25000.00   Tester   20   22000.00   Tester   20   47000.00   Analayst   30   47000.00   Analayst   30   47000.00   Analayst   30   47000.00   Fesident   50   50000.00   President   50   50000.00   President   20   50000.00   President   20   50000.00   President   10	50000.00   President   40   Research   45000.00   Manager   10   Development   40000.00   Manager   20   Testing   30000.00   Developer   10   Development   25000.00   Developer   10   Development   25000.00   Tester   20   Testing   22000.00   Tester   20   Testing   47000.00   Analayst   30   operation   47000.00   Analayst   30   operation   47000.00   Development   50000.00   President   50   sales   50000.00   President   30   operation   50000.00   President   20   Testing   50000.00   President   20   Testing   50000.00   President   10   Development					

## **Left Outer Join:**

Select eid, ename, salary, job, D. dno, dname, location from employee E left outer join Dept D ON (E.DNo = D.DNo);

```
32 rows in set (0.00 sec)
mysql> select eid,ename,salary,job,D.dno,dname,location from employee E LEFT OUT
ER JOIN Dept D ON (E.Dno = D.Dno);
        ename | salary
                                                               location
        King
                50000.00
  101
                            President
                                           40
                                                Research
                                                               Chennai
  102
                45000.00
                                                Development
        smith
                            Manager
                                           10
                                                               Hyderabad
                                                Testing
                                                               Banglore
        Ford
                40000.00
                            Manager
                                           20
  103
                30000.00
                                                               Hyderabad
  104
        Tom
                            Developer
                                           10
                                                Development
  105
        Scott
                 35000.00
                            Developer
                                           10
                                                Development
                                                               Hyderabad
  106
        Jerry
                 25000.00
                            Tester
                                           20
                                                 Testing
                                                               Banglore
  107
        Ravi
                22000.00
                            Tester
                                           20
                                                Testing
                                                               Banglore
  108
        Adam
                47000.00
                            Analayst
                                           30
                                                operation
                                                               Mumbai
                     NULL
                                         NULL
                                                               NULL
  110
        Anil
                            NULL
                                                NULL
  rows in set (0.00 sec)
```

Assignment 3: Utilize a subquery to find customers who have placed orders above the average order value, and write a UNION query to combine two SELECT statements with the same number of columns.

Here I have create employee table and dept table.

Inserted some records into employee table and dept table.

### SubQuery:

sub query a query inside another query

select \* from employee where salary > (select salary from employee where ename = 'Tom');

select \* from employee where salary >ANY (Select salary from employee where job = 'manager');

```
MySQL 8.0 Command Line Client
  * from employee where salary > (select salary from employee where ename = '
mysql> select * from employee where salary > (select salary from employee where
ename = 'Tom');
                Salary
                                                 DOJ
                                                               Mid
                                                                      DNo
  Fid
        EName
                                    Joh
                            comm
                                                 2020-12-01
  101
        King
                 50000.00
                            NULL
                                    President
                                                               NULL
                                                                         40
  102
        smith
                 45000.00
                            NULL
                                    Manager
                                                 2021-09-23
                                                                101
                                                                         10
  103
        Ford
                 40000.00
                            NULL
                                    Manager
                                                 2022-04-15
                                                                101
                                                                         20
  105
        Scott
                 35000.00
                            1000
                                    Developer
                                                 2023-12-25
                                                                102
                                                                         10
                47000.00
  108
        Adam
                            NULL
                                    Analayst
                                                 2024-01-01
                                                                101
                                                                         30
  rows in set (0.00 sec)
mysql> select * from employee where salary >ANY (select salary from employee whe
re job = 'manager');
       EName
                 Salary
                                                DOJ
                                                              Mid
                            comm
  101
                            NULL
                                    President
                                                 2020-12-01
                                                               NULL
                                                                         40
        King
                 50000.00
  102
        smith
                 45000.00
                            NULL
                                                 2021-09-23
                                                                         10
                                    Manager
                                                                101
  108
        Adam
                47000.00
                            NULL
                                    Analayst
                                                 2024-01-01
                                                                101
                                                                         30
 rows in set (0.00 sec)
```

select \* from employee where salary <ANY (Select salary from employee where job = 'manager');

select \* from employee where salary >ALL (Select salary from employee where job = 'manager');

select \* from employee where salary <ALL (Select salary from employee where job = 'manager');

```
mysql> select * from employee where salary <ANY (select salary from employee whe
re job = 'manager');
                                               DOJ
                                                             Mid
                Salary
                                                                      DNo
  Eid
                            comm
                                    Job
  103
                 40000.00
                            NULL
                                    Manager
                                                 2022-04-15
                                                               101
                                                                        20
  104
                 30000.00
                            1500
                                    Developer
                                                 2023-10-18
                                                                102
                                                                        10
  105
        Scott
                 35000.00
                            1000
                                    Developer
                                                 2023-12-25
                                                                102
                                                                        10
  106
        Jerry
                 25000.00
                            3000
                                    Tester
                                                 2024-05-20
                                                               103
                                                                        20
  107
        Ravi
                22000.00
                            4000
                                    Tester
                                                 2024-05-19
                                                               103
                                                                        20
 rows in set (0.00 sec)
mysql> select * from employee where salary <ALL (select salary from employee whe
re job = 'manager');
 Eid l
        EName
                Salarv
                            comm
                                                             Mid
                                                                     DNo
  104
        Tom
                 30000.00
                            1500
                                    Developer
                                                 2023-10-18
                                                               102
                                                                        10
  105
        Scott
                 35000.00
                            1000
                                    Developer
                                                 2023-12-25
                                                               102
                                                                        10
                 25000.00
  106
        Jerry
                            3000
                                    Tester
                                                 2024-05-20
                                                                103
                                                                        20
  107
        Ravi
                22000.00
                            4000
                                                 2024-05-19
                                                               103
                                                                        20
 rows in set (0.00 sec)
```

#### Union:

Select eid, ename, salary, job, D. dno, dname, location from employee E Left outer Join dept D ON(D.No = E.No) UNION select eid, ename, salary, job, D. DNo, dname, location from employee E Right outer Join Dept ON(D.No = E.No);

Select eid, ename from employee UNION select dno, dname from Dept;

OUTER JO	select e: DIN Dept	D ON(D.DNo	alary, job, [ = E.DNo) UN:	ION sele		from employee E LEFT salary,job,D.DNo,Dnar = E.DNo);
eid	ename	salary	job	DNo	dname	Location
101   102   103   104   105   106   107   108   110   NULL	King   Smith   Ford   Tom   Scott   Jerry   Ravi   Adam   Anil	50000.00   45000.00   40000.00   30000.00   35000.00   25000.00   47000.00   NULL   NULL	President Manager Manager Developer Developer Tester Tester Analayst NULL	40   10   20   10   10   20   20   30   NULL	Research Development Testing Development Development Testing Testing operation NULL sales	Chennai
		(0.00 sec) id,ename fro	om employee (	JNION se	elect dno, dna	me from Dept;  Activate Windows Go to Settings to activate Windows.

Assignment 4: Compose SQL statements to BEGIN a transaction, INSERT a new record into the 'orders' table, COMMIT the transaction, then UPDATE the 'products' table, and ROLLBACK the transaction.

### Create orders table and insert values into orders table:

```
CREATE TABLE orders (
order_id INT(2) PRIMARY Key,
customer_id INT(3),
order_date DATE,
order_total DECIMAL(10,2),
order_status VARCHAR(50)
);
```

Insert into orders values(1,01,'2024-05-15', 2025.99, 'confirm'), (2,02,'2024-05-18' 250.99,'confirm'),(3,03,'2024-05-20',1050.00,'pending'));

```
mysql> create table orders(orderid int(2) primary key, custid int(3), order date
date);
Query OK, 0 rows affected, 2 warnings (0.06 sec)
mysql> alter table obers add(order_status varchar(20));
ERROR 1146 (42S02): Table 'librarymanagement.obers' doesn't exist
mysql> alter table orders add(order_status varchar(20));
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0
mysql> desc orders;
 Field
               Type
                             | Null | Key | Default | Extra
  orderid
                int
                                      PRI
                                            NULL
  custid
                int
                               YES
                                            NULL
  order date
                date
                               YES
                                            NULL
 order status | varchar(20) |
                              YES
                                            NULL
  rows in set (0.01 sec)
```

```
mysql> insert into orders values(1,01,'2024-05-15','confirm',2050.99);
Query OK, 1 row affected (0.01 sec)
mysql> insert into orders values(2,02,'2024-05-18','confirm',250.99);
Query OK, 1 row affected (0.01 sec)
mysql> insert into orders values(3,03,'2024-05-20','pending',1150.99);
Query OK, 1 row affected (0.01 sec)
mysql> select * from orders;
 orderid | custid | order date | order status | order total
        1
                1
                    2024-05-15
                                  confirm
                                                     2050.99
                     2024-05-18
        2
                 2
                                  confirm
                                                     250.99
                     2024-05-20
                                 pending
                                                     1150.99
```

# Create a products table and insert values into products table:

Create table products(prod\_id int(5) primary key, pname varchar(20), category varchar(50), pprice decimal(7,2));

Insert into products values(1,'dress','clothing',1050.00), (2,'eyeliner','cosmetics',1050.99);

```
Empty set (0.00 sec)
mysql> desc products;
                          | Null | Key | Default | Extra
  Field
           Type
  prod id
             int
                                         NULL
  Pname
             varchar(50)
                            YES
                                         NULL
  category
             varchar(50)
                            YES
                                         NULL
  pprice
           | decimal(9,2) |
                            YES
                                         NULL
4 rows in set (0.01 sec)
mysql> insert into products values(01, 'dress', 'clothing',1050.00);
Query OK, 1 row affected (0.01 sec)
mysql> insert into products values(02,'eyeliner','cosmetics',1050.00);
Query OK, 1 row affected (0.01 sec)
mysql> select * from products;
  prod_id | Pname
                     category
                                 pprice
        1
                     clothing
           dress
                                 1050.00
        2 | eyeliner | cosmetics | 1050.00
2 rows in set (0.00 sec)
```

### Start transaction;

Insert into orders (orderid,custid,order\_date order\_total) values (4,4,'2024-05-21', 150.09);

#### Commit;

```
mysql> insert into orders (orderid,custid,order_date,order_total) values (4,4,024-05-21',150.09);
Query OK, 1 row affected (0.00 sec)
mysql> select * from orders;
  orderid | custid | order_date | order_status
                                                                    order total
                             2024-05-15
2024-05-18
2024-05-20
2024-05-21
                                                                          2050.99
250.99
1150.99
150.09
                                                confirm
                                                confirm
                                               pending
NULL
4 rows in set (0.00 sec)
mysql> commit;
Query OK, 0 rows affected (0.01 sec)
mysql> select * from orders;
  orderid | custid | order_date | order_status | order_total |
                             2024-05-15
                                               confirm
                                                                          2050.99
                                               confirm
pending
NULL
                             2024-05-18
2024-05-20
                                                                           250.99
1150.99
           4
                             2024-05-21
                                                                            150.09
```

Update products set pname = 'tshirt' where prod\_id = 1;

Rollback;

```
mysql> select * from products;
 prod id | Pname
                        category | pprice
        1 dress
                                     1050.00
                        clothing
        2 | eyeliner | cosmetics
                                   1050.00
2 rows in set (0.00 sec)
mysql> update products set pname = Tshirt where prod_id = 1;
ERROR 1054 (42S22): Unknown column 'Tshirt' in 'field list' mysql> update products set pname = 'Tshirt' where prod_id = 1;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> select * from products;
 prod_id | Pname
                      category pprice
        1 | Tshirt | clothing | 1050.00
        2 | eyeliner | cosmetics | 1050.00
2 rows in set (0.00 sec)
mysql> rollback;
Query OK, 0 rows affected (0.00 sec)
```

Assignment 5: Begin a transaction, perform a series of INSERTs into 'orders', setting a SAVEPOINT after each, rollback to the second SAVEPOINT, and COMMIT the overall transaction.

Start transaction;

Insert into orders (orderid, custid,order\_date,order\_total) values(5,05,'2024-04-09','1000.00);

Savepoint savepoint\_1;

Insert into orders (orderid, custid, order\_date, order\_total) values (6,06,'2024-04-18','1090.99);

Savepoint savepoint\_2;

Rollback savepoint\_2 // Any changes made after savepoint\_2 will be rolled back.

Commit;

```
mysql> select * from orders;
  orderid | custid | order_date | order_status | order_total |
                ----+-----
                1 | 2024-05-15 | confirm
                                                  2050.99
        1
                2 | 2024-05-13 | Confirm
2 | 2024-05-18 | confirm
3 | 2024-05-20 | pending
4 | 2024-05-21 | NULL
        2
                                                     250.99
        3 l
                                                     1150.99
                                                     150.09
        4
4 rows in set (0.00 sec)
mysql> start transaction;
Query OK, 0 rows affected (0.00 sec)
mysql> insert into orders(orderid, custid, order_date, order_total) values(5,05,'
2024-04-9',1000.00);
Query OK, 1 row affected (0.00 sec)
mysql> select * from orders;
orderid | custid | order_date | order_status | order_total |
                 1 | 2024-05-15 | confirm
                                                     2050.99
        1 |
        2
                 2 | 2024-05-18 | confirm
                                                     250.99
        3 I
                 3 | 2024-05-20 |
                                  pending
                                                     1150.99
                                                      150.09
                     2024-05-21
                 4
                                  NULL
        4
                 5 | 2024-04-09 |
                                  NULL
                                                     1000.00
mysql> savepoint savepoint_1;
Query OK, 0 rows affected (0.00 sec)
mysql> insert into orders(orderid, custid, order_date, order_total) values(6,06,
2024-04-16',1090.00);
Query OK, 1 row affected (0.00 sec)
mysql> select * from orders;
orderid | custid | order_date | order_status | order_total |
               1 | 2024-05-15 | confirm
       1 |
                                                    2050.99
                2 | 2024-05-18 | confirm
        2 |
                                                     250.99
                3 | 2024-05-20 | pending
        3 l
                                                    1150.99
                4 | 2024-05-21 | NULL
       4
                                                     150.09
                5 | 2024-04-09 | NULL
                                                    1000.00
                6 | 2024-04-16 | NULL
                                                     1090.00
6 rows in set (0.00 sec)
mysql> savepoint savepoint 2;
Query OK, 0 rows affected (0.00 sec)
mysql> rollback to savepoint_2;
Query OK, 0 rows affected (0.00 sec)
mysql> select * from orders;
```

```
mysql> commit;
Query OK, 0 rows affected (0.01 sec)
mysql> select * from orders;
 orderid | custid | order_date | order_status | order_total
       1 |
               1 | 2024-05-15 | confirm
                                                    2050.99
                2 | 2024-05-18 | confirm
       2 |
                                                     250.99
                3 | 2024-05-20 | pending
       3 |
                                                     1150.99
       4
                4 | 2024-05-21 | NULL
                                                     150.09
                5 | 2024-04-09 | NULL
                                                     1000.00
                6 | 2024-04-16 | NULL
       6
                                                    1090.00
6 rows in set (0.00 sec)
mysql>
```

Assignment 6: Draft a brief report on the use of transaction logs for data recovery and create a hypothetical scenario where a transaction log is instrumental in data recovery after an unexpected shutdown.

Transaction logs are crucial components of database management systems that record all changes made to a database. These logs serve as a reliable source of information for recovering data in the event of system failures or unexpected shutdowns.

#### **Importance of Transaction Logs:**

- Data Integrity: Transaction logs ensure data integrity by recording every transaction before it is committed to the database. This allows for rollbacks or recovery to a specific point in time.
- 2. Recovery Point: They provide a recovery point in case of system failures, allowing databases to be restored to a consistent state prior to the failure.
- 3. Performance Monitoring: Transaction logs also aid in performance monitoring and troubleshooting, as they track changes and can identify potential issues.

## **Hypothetical Scenario:**

Imagine a scenario where a large e-commerce company experiences an unexpected server shutdown during a peak shopping period, resulting in potential data loss and customer disruption. However, due to the

implementation of transaction logs, the company's database administrator can initiate a successful data recovery process.

#### **Scenario Details:**

- 1. Unexpected Shutdown: The e-commerce platform experiences a sudden server shutdown due to a power outage.
- 2. Data Loss Concerns: Concerns arise about potential data loss, including ongoing transactions and customer orders that were being processed.
- 3. Transaction Logs Utilization: The database administrator leverages transaction logs to restore the database to its state just before the shutdown.
- 4. Recovery Process: By analysing the transaction logs, the administrator identifies the last committed transactions before the shutdown.
- 5. Database Restoration: Using this information, the administrator restores the database to the point just before the unexpected shutdown, ensuring minimal data loss and maintaining data consistency.
- 6. Customer Impact Mitigation: The quick recovery minimizes disruption for customers, allowing them to resume their transactions seamlessly.

#### **Conclusion:**

Transaction logs play a vital role in data recovery, especially in scenarios of unexpected shutdowns or system failures. By maintaining a record of all database transactions, transaction logs enable organizations to restore data integrity and minimize downtime, ultimately ensuring business continuity and customer satisfaction.