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AIM:	To perform subqueries in MySQL.
Program 1	
PROBLEM STATEMENT:	Write subqueries on the tables in the database on MySQL.
THEORY:	**What is an SQL subquery?** A Subquery or Inner query or Nested query is a query within another SQL query and embedded within the WHERE clause. A subquery is used to return data that will be used in the main query as a condition to further restrict the data to be retrieved. Subqueries can be used with the SELECT, INSERT, UPDATE, and DELETE statements along with the operators like =, <, >, >=, <=, IN, BETWEEN, etc. There are a few rules that subqueries must follow − • Subqueries must be enclosed within parentheses. • A subquery can have only one column in the SELECT clause unless multiple columns are in the main query for the subquery to compare its selected columns. • An ORDER BY command cannot be used in a subquery, although the main query can use an ORDER BY. The GROUP BY command can be used to perform the same function as the ORDER BY in a subquery. • Subqueries that return more than one row can only be used with multiple value operators such as the IN operator. • The SELECT list cannot include any references to values that evaluate a BLOB, ARRAY, CLOB, or NCLOB.

- A subquery cannot be immediately enclosed in a set function.
- The BETWEEN operator cannot be used with a subquery. However, the BETWEEN operator can be used within the subquery.

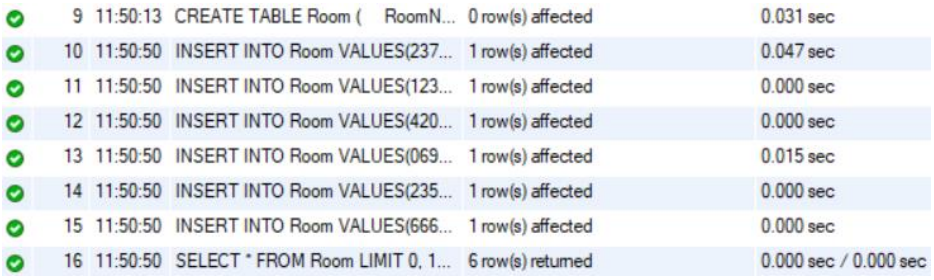
Subqueries with the SELECT Statement

Subqueries are most frequently used with the SELECT statement. The basic syntax is as follows –

```
SELECT column_name [, column_name ]
FROM table1 [, table2 ]
WHERE column_name OPERATOR
  (SELECT column_name [, column_name ]
  FROM table1 [, table2 ]
  [WHERE])
```

QUERIES:

Using Create, Insert Into, Select Commands:



✓	9	11:50:13	CREATE TABLE Room (RoomN...	0 row(s) affected	0.031 sec
✓	10	11:50:50	INSERT INTO Room VALUES(237...	1 row(s) affected	0.047 sec
✓	11	11:50:50	INSERT INTO Room VALUES(123...	1 row(s) affected	0.000 sec
✓	12	11:50:50	INSERT INTO Room VALUES(420...	1 row(s) affected	0.000 sec
✓	13	11:50:50	INSERT INTO Room VALUES(069...	1 row(s) affected	0.015 sec
✓	14	11:50:50	INSERT INTO Room VALUES(235...	1 row(s) affected	0.000 sec
✓	15	11:50:50	INSERT INTO Room VALUES(666...	1 row(s) affected	0.000 sec
✓	16	11:50:50	SELECT * FROM Room LIMIT 0, 1...	6 row(s) returned	0.000 sec / 0.000 sec

Table Room

RoomNumber	RoomAvailability	RoomSize	RoomType	HotelID
69	YES	2 persons	Deluxe	103
123	YES	4 persons	Non-A.C	103
235	YES	1 person	A.C	103
237	NO	2 persons	A.C	103
420	YES	3 persons	A.C	103
666	YES	3 persons	A.C	103
NULL	NULL	NULL	NULL	NULL

Using Create, Insert Into, Select Commands:

31	19:30:36	CREATE TABLE Customers (Custome...	0 row(s) affected	0.031 sec
32	19:30:42	INSERT INTO Customers VALUES('S...	1 row(s) affected	0.016 sec
33	19:30:42	INSERT INTO Customers VALUES('M...	1 row(s) affected	0.000 sec
34	19:30:42	INSERT INTO Customers VALUES('Vi...	1 row(s) affected	0.000 sec
35	19:30:42	INSERT INTO Customers VALUES('S...	1 row(s) affected	0.000 sec
36	19:30:42	INSERT INTO Customers VALUES('Ar...	1 row(s) affected	0.000 sec
37	19:30:42	INSERT INTO Customers VALUES('S...	1 row(s) affected	0.000 sec
38	19:30:42	SELECT * FROM Customers LIMIT 0, ...	6 row(s) returned	0.000 sec / 0.000 sec

Table Customers

CustomerName	DOB	Aadhar	Address	Contact	RoomNumber
Aryan	14/04/2003	587899489	Mumbai	787878787	NULL
Mufaddal	16/09/2003	646448884	Mumbai	888888888	237
Sahil	23/05/2003	654898988	Mumbai	999999999	NULL
SRK	12/10/1968	659442484	Delhi	979797979	420
Swapnil	15/11/2003	778945888	Mumbai	898989898	NULL
Vignesh	16/12/2003	879128959	Solapur	777777777	69
NULL	NULL	NULL	NULL	NULL	NULL

1) Display all the items from the table Room where the room available is the minimum price for all room numbers greater than 300:

```
SELECT *
FROM Room
WHERE RoomAvailability = (
        SELECT DISTINCT RoomAvailability
        FROM Room
        WHERE RoomPrice = (
                SELECT MIN(RoomPrice)
                FROM Room
                WHERE RoomNumber > 300
         )
);
```

RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
69	YES	3 persons	Deluxe	5000	103
123	YES	4 persons	Non-A.C	3000	103
235	YES	1 person	A.C	1000	103
420	YES	3 persons	A.C	4000	103
666	YES	3 persons	A.C	4000	103
NULL	NULL	NULL	NULL	NULL	NULL

2) Display all the items from the table Room where the price of the room is either minimum or maximum:

```
SELECT *
FROM Room
WHERE RoomPrice = (
        SELECT MIN(RoomPrice) FROM Room
) OR RoomPrice = (
        SELECT MAX(RoomPrice) FROM Room
);
```

RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
69	YES	3 persons	Deluxe	5000	103
235	YES	1 person	A.C	1000	103
NULL	NULL	NULL	NULL	NULL	NULL

3) Display all the items from the table Room where the room number is of the customer who has the minimum contact number and has their address starting from ‘S’:

```
SELECT *
FROM Room
WHERE RoomNumber = (
        SELECT RoomNumber
        FROM Customers
        WHERE Contact = (
                SELECT MIN(Contact)
                FROM Customers
                WHERE Address LIKE 'S%'
         )
);
```

RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
69	YES	3 persons	Deluxe	5000	103
NULL	NULL	NULL	NULL	NULL	NULL

4) Display the room type, room price, and room availability from the table Room where the room number is the one of the customers from Delhi:

```
SELECT RoomType, RoomPrice, RoomAvailability
FROM Room
WHERE RoomNumber IN (
        SELECT RoomNumber
        FROM Customers
        WHERE Address IN (
                SELECT Address
```

```
            FROM Customers
            WHERE Address = 'Delhi'
        )
);
```

	RoomType	RoomPrice	RoomAvailability
▶	A.C	4000	YES

5) Display all the items from the table Room where the room price is greater than the minimum room price:

```
SELECT * FROM Room
WHERE RoomPrice > (
        SELECT MIN(RoomPrice)
        FROM Room
);
```

	RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
▶	69	YES	3 persons	Deluxe	5000	103
	123	YES	4 persons	Non-A.C	3000	103
	237	NO	2 persons	A.C	2000	103
	420	YES	3 persons	A.C	4000	103
	666	YES	3 persons	A.C	4000	103
*	NULL	NULL	NULL	NULL	NULL	NULL

6) Display all the items from the table Room where the room number is greater than 300 with no availability:

```
SELECT * FROM Room
WHERE RoomNumber = (
        SELECT RoomNumber
        FROM Room
        WHERE RoomAvailability = 'NO' AND RoomNumber > 200
);
```

	RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
▶	237	NO	2 persons	A.C	2000	103
*	NULL	NULL	NULL	NULL	NULL	NULL

7) Display the customer name, date of birth, and Aadhar number from the table Customers whose room number is the one with a price greater than 4500:

```
SELECT CustomerName, DOB, Aadhar
FROM Customers
WHERE RoomNumber = (
```

```
        SELECT RoomNumber
        FROM Room
        WHERE RoomPrice > 4500
);
```

	CustomerName	DOB	Aadhar
▶	Vignesh	16/12/2003	879128959
*	NULL	NULL	NULL

8) Display the room number, size, availability, and type from the table Room whose price is greater than the average price of the rooms:

```
SELECT RoomNumber, RoomSize, RoomAvailability, RoomType
FROM Room
WHERE RoomPrice >= (
        SELECT AVG(RoomPrice)
        FROM Room
);
```

	RoomNumber	RoomSize	RoomAvailability	RoomType
▶	69	3 persons	YES	Deluxe
	420	3 persons	YES	A.C
	666	3 persons	YES	A.C
*	NULL	NULL	NULL	NULL

9) Display all the items from the table Room whose room number is the one with the capacity of two persons or three persons:

```
SELECT * FROM Room
WHERE RoomNumber IN (
        SELECT RoomNumber
        FROM Room
        WHERE RoomSize = '2 persons' OR RoomSize = '3 persons'
)
ORDER BY RoomAvailability;
```

	RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
▶	237	NO	2 persons	A.C	2000	103
	69	YES	3 persons	Deluxe	5000	103
	420	YES	3 persons	A.C	4000	103
	666	YES	3 persons	A.C	4000	103
*	NULL	NULL	NULL	NULL	NULL	NULL

10) Display the room number, type, size, and price from the table Room where the room number is the one where customers have their contact numbers greater than 777777777:

```
SELECT RoomNumber, RoomType, RoomSize, RoomPrice
FROM Room
WHERE RoomNumber IN (
        SELECT RoomNumber
        FROM Customers
        WHERE Contact > 777777777
);
```

RoomNumber	RoomType	RoomSize	RoomPrice
237	A.C	2 persons	2000
420	A.C	3 persons	4000
NULL	NULL	NULL	NULL

11) Display all the items from the table Room where the room size is the one with a price range between the average and the maximum prices of the rooms:

```
SELECT * FROM Room
WHERE RoomSize IN (
        SELECT RoomSize
        FROM Room
        HAVING RoomPrice >= AVG(RoomPrice) AND RoomPrice <= MAX(RoomPrice)
);
```

RoomNumber	RoomAvailability	RoomSize	RoomType	RoomPrice	HotelID
69	YES	3 persons	Deluxe	5000	103
420	YES	3 persons	A.C	4000	103
666	YES	3 persons	A.C	4000	103
NULL	NULL	NULL	NULL	NULL	NULL

12) Update the address of the customers who have the room number as the one with Deluxe room type and of capacity 3 persons in the table Customers:

```
UPDATE Customers
SET Address = 'Delhi'
WHERE RoomNumber = (
        SELECT RoomNumber
        FROM Room
        WHERE RoomType = 'Deluxe' AND RoomSize = '3 persons'
);
```

	CustomerName	DOB	Aadhar	Address	Contact	RoomNumber
▶	Aryan	14/04/2003	587899489	Mumbai	787878787	NULL
	Mufaddal	16/09/2003	646448884	Mumbai	888888888	237
	Sahil	23/05/2003	654898988	Mumbai	999999999	NULL
	SRK	12/10/1968	659442484	Delhi	979797979	420
	Swapnil	15/11/2003	778945888	Mumbai	898989898	NULL
	Vignesh	16/12/2003	879128959	Delhi	777777777	69
*	NULL	NULL	NULL	NULL	NULL	NULL

CONCLUSION:

In this experiment, I learned about subqueries and nested subqueries in SQL – their definitions and their generic syntaxes. I used the aggregate functions which I learned in the previous experiment in most of the subqueries. I also made a subquery with the update function. Subqueries help to divide the complex query into isolated parts so that a complex query can be broken down into a series of logical steps.