Database Management System Lab

Bipin Giri Roll no. 19

Experiment No.: 1

Aim	Construct an ER diagram for the assigned application.
Objective	- To acquire basic knowledge of database - To design the ER model of a given case study
Outcomes	1. Students will be able to understand the importance of databases. 2. Able to design ER diagrams for the given case study.
Solution	
Problem Statement:	The Hotel is organized into rooms. Each room has a unique room number, no. of beds and price associated with that room. We Keep track of the day when a customer books the room. We store Each customer's name, gender, unique id, birth date. A customer is assigned a room but may book many rooms. The rooms are managed by employees/staff. We store each employee's department, qualification, employee id. Every room is either a deluxe or economical. A deluxe room has AC and high-speed internet connection whereas an economical room only has low speed internet connection. Every room has an invoice associated with the customer. We keep track of Emergency contacts of the customer for emergency purposes.
Step 1:	**list all the entities with their attributes:** Customer (uid , b_date , F_name , M_name , L_name ,gender) Cust_Phone_no's (uid (fk) , phone_no)

	Emergency-Contact (Uid (fk) , contact_no.)
	Invoice (invoice_no. , R_no. (fk) , uid (fk))
	Room (R_no. , no._of_beds , price)
	Delux (R_no. (fk) , AC)
	Economical (R_no. (fk) , Wifi)
	Books (R_no. (fk) , date , time ,uid)
	Staff (manager , R_no. (fk) , Emp_id , qualification , department)
Step 2:	**list all relationships with cardinality:**
	customer has invoice for room (1:1)
	customer books room (1:N)
	Rooms managed by staff (M:N)
Step 3:	**List all types of attributes**
	Single Attribute: uid,invoice_no. etc
	Multivalued Attribute: phone_no., qualification etc
	Composite Attribute: b_date, name etc
	Derived Attribute: age
Step 4:	**Mention Recursive relationship**
	Manager manages staff / employee (one to many relationship)

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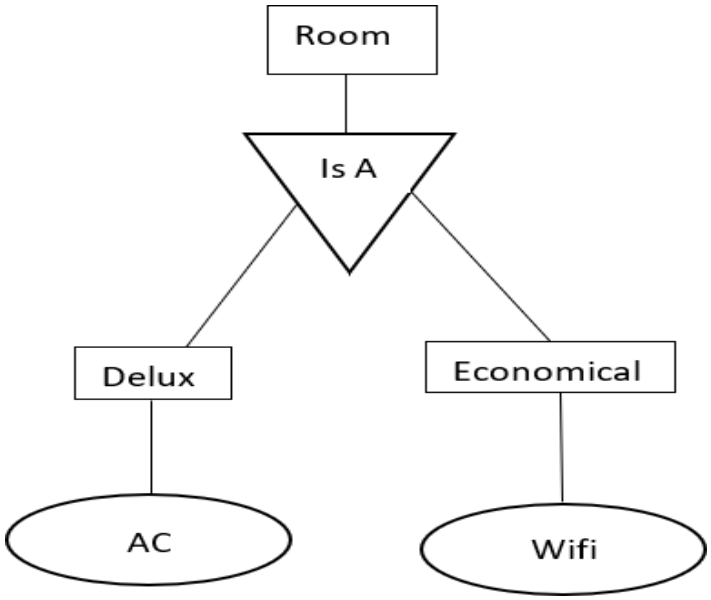
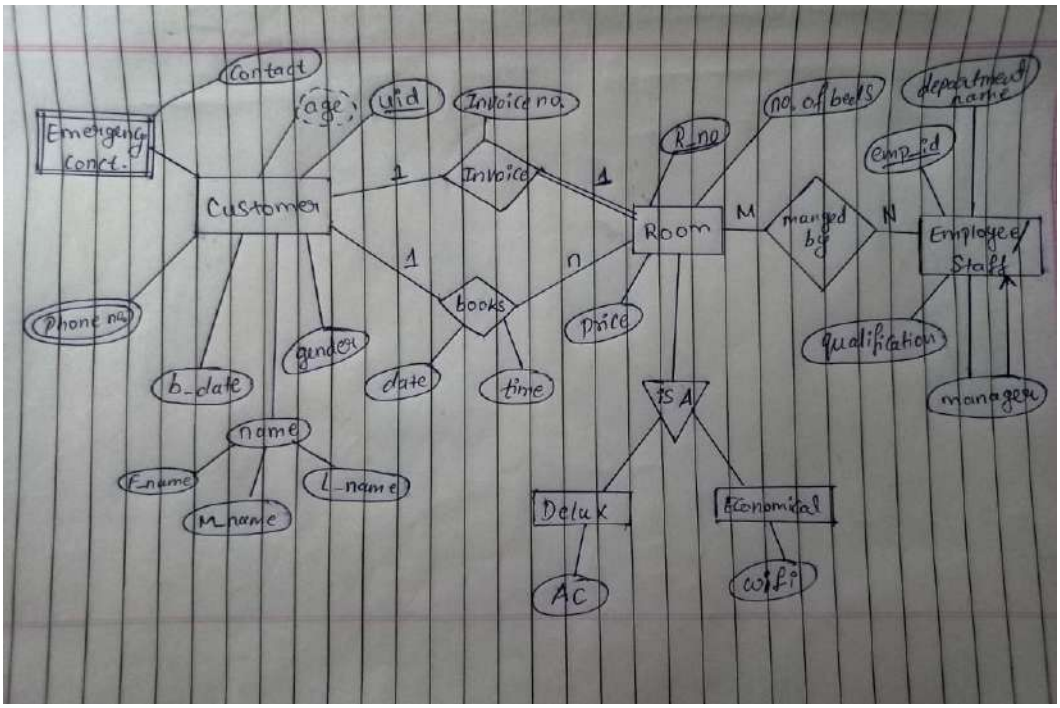
Step 5:

Specialization:



Step 6:

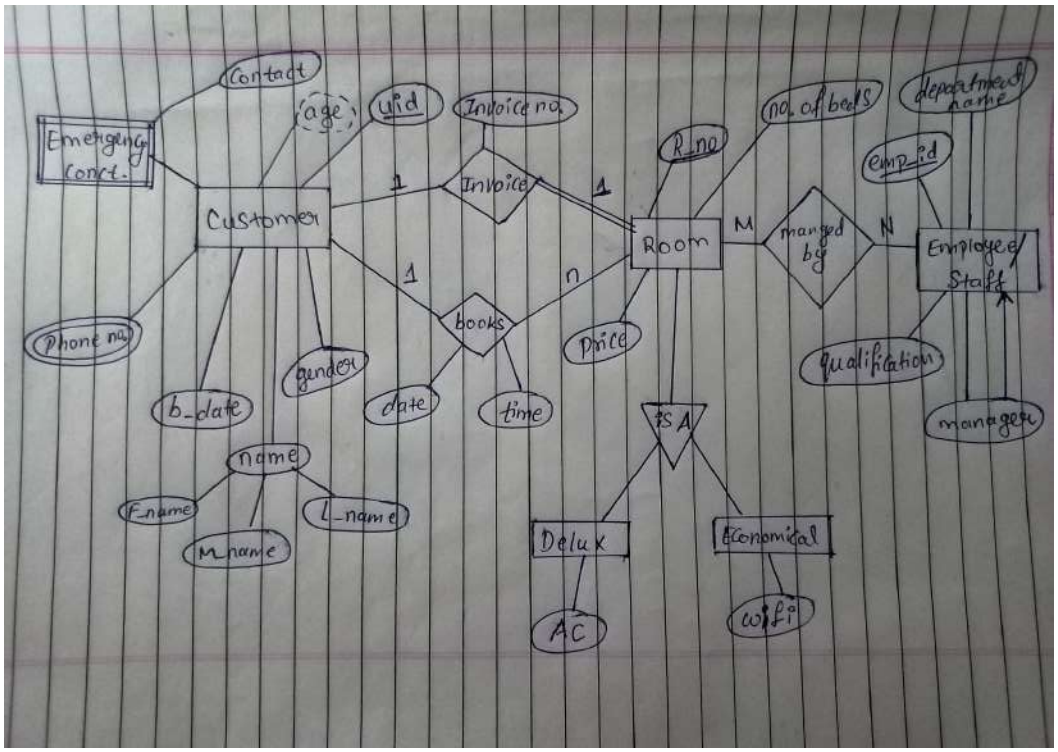
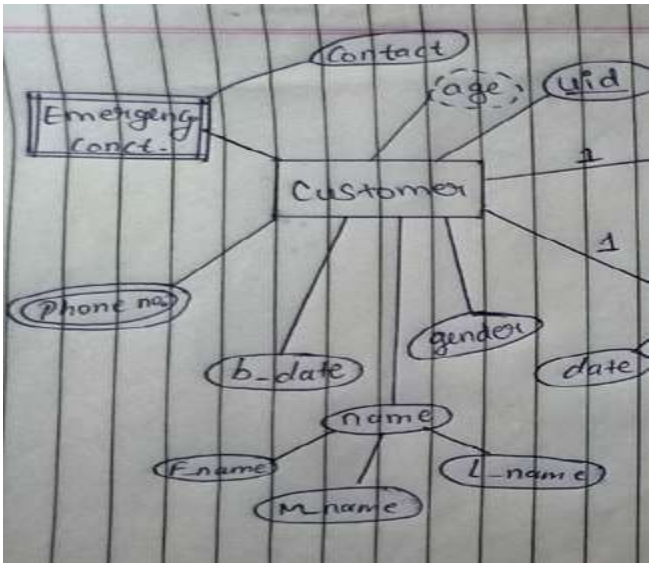
Final ER diagram



Conclusion: Understanding and implementing Entity Relationship Diagram

Experiment No.: 2

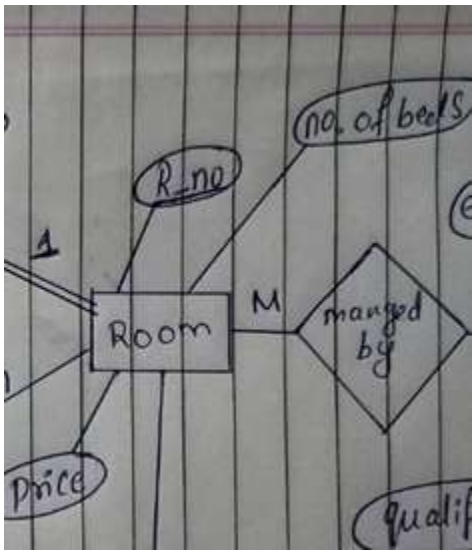
Aim	Mapping the ER and EER Model to the Relational Model.
Objective	Convert ER and EER into Relational Model.
Outcomes	Students should be able to learn how to transform an ER diagram into an equivalent set of well-structured relations.
Solution: **Step 1:**	**Explain terms Database, DBMS and RDBMS** A database is a tool for collecting and organizing information. Databases can store information about people, products, orders, or anything else. Many databases start as a list in a word-processing program or spreadsheet. As the list grows bigger, redundancies and inconsistencies begin to appear in the data. The data becomes hard to understand in list form, and there are limited ways of searching or pulling subsets of data out for review. Once these problems start to appear, it's a good idea to transfer the data to a database created by a database management system (DBMS). A database management system (or DBMS) is essentially nothing more than a computerized data-keeping system. Users of the system are given facilities to perform several kinds of operations on such a system for either manipulation of the data in the database or the management of the database structure itself. Database Management Systems (DBMSs) are categorized according to their data structures or types. A relational database management system (RDBMS) is a program that allows you to create, update, and administer a relational database. They are the most popular data model because of its user-friendly interface. It is based on normalizing data in the rows and columns of the tables. This is a viable option when you need a data storage system that is scalable, flexible, and able to manage lots of information.

Step 2:	**Final ER Diagram** 
Step 3:	**Step wise Solution for Relational model** <u>Mapping Entity</u> 

Customer :

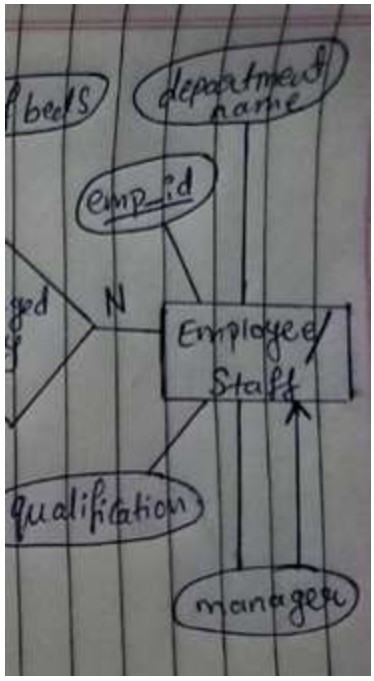
uid (Pk)	b_date	F_name	M_name	L_name	gender

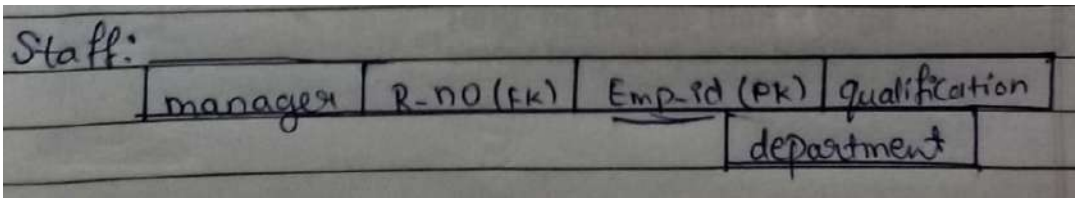
uid(FK)	Phone_no.



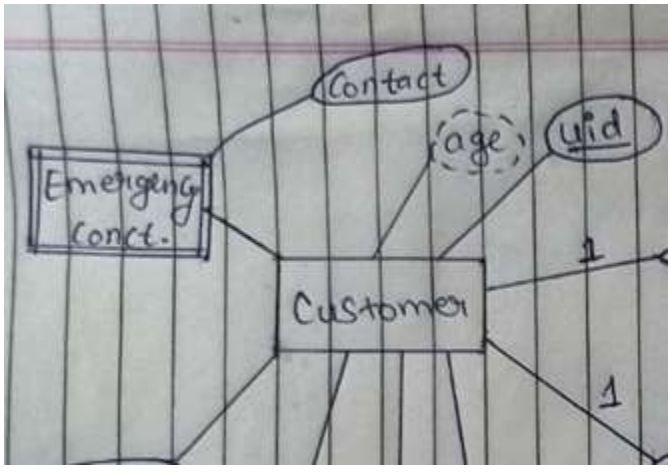
ROOM :

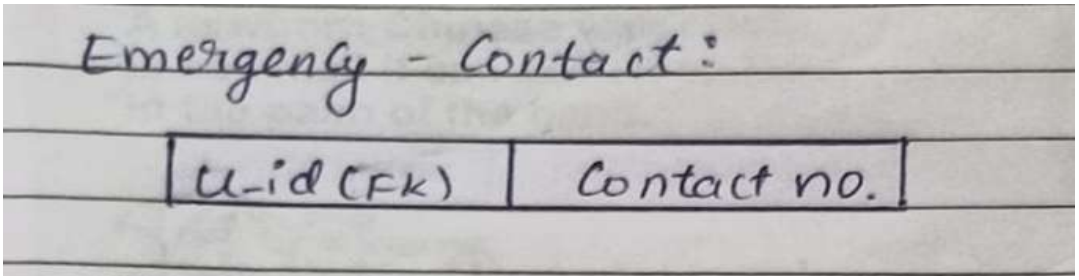
R_no. (Pk)	no. of beds	Price



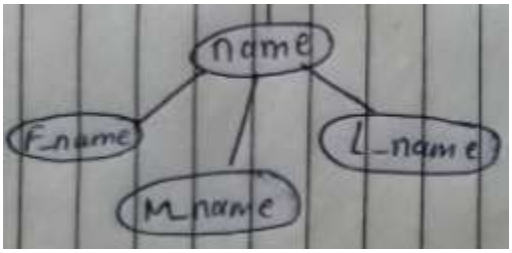


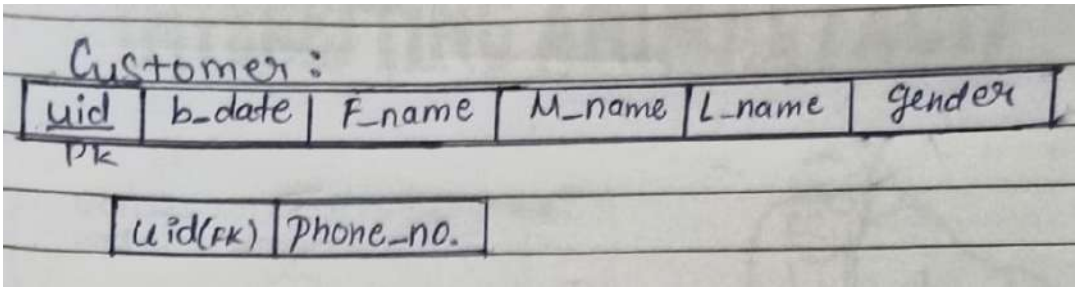
Mapping Weak Entity



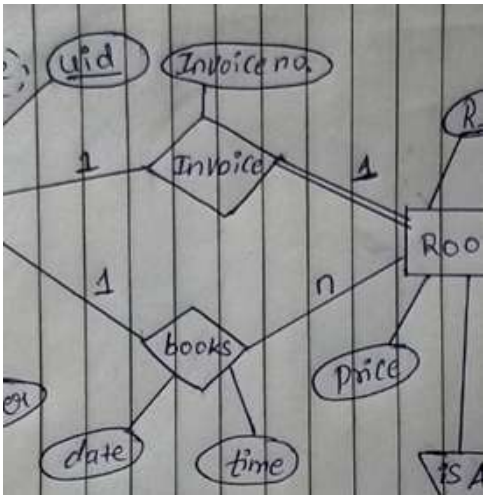


Mapping Composite Attribute





Mapping Relationship

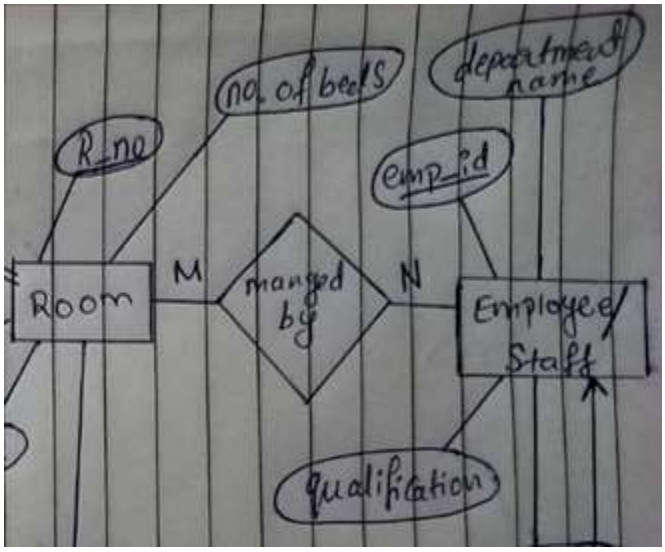


invoice:

invoice_no. (PK)	R_no. (FK)	U_id (FK)

Books:

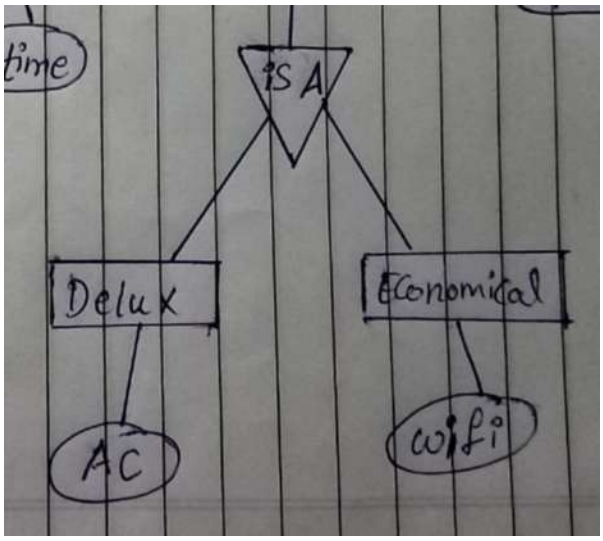
R_no. (PK)	date	time	Uid (FK)

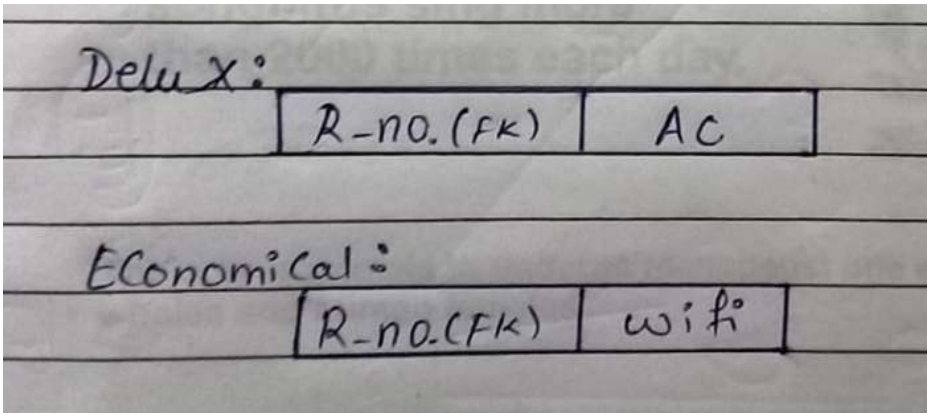


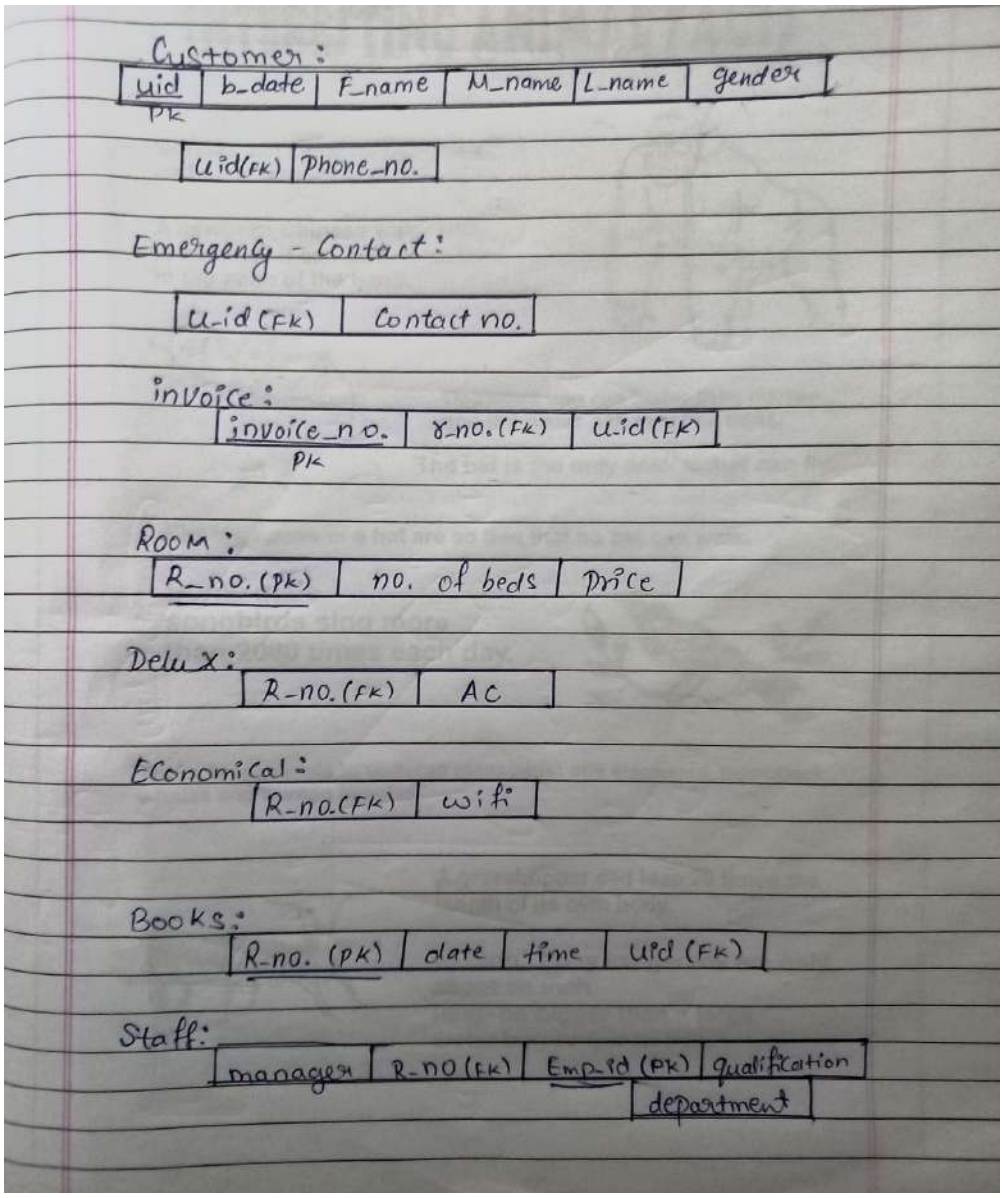
Managed_by:

R_no (fk)	Emp_id (fk)

Mapping Hierarchical Entities





Step 4:	**final Relational Model**  Managed_by: R_no (fk) | Emp_id (fk)
Conclusion:	Able to transform an ER diagram into an equivalent set of well-structured relations.

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EXPERIMENT NO. 3

AIM: Create a database using Data Definition Language (DDL) commands for the assigned system.

Objective: Execute all Data Definition Language commands and Table Creation and its management.

Outcome:

Student should be able to:

-Explain the use of DDL commands.

-Create new database tables by applying these commands.

-Manage the structure of database.

Instructions:

1. This experiment is a compulsory experiment. All the students are required to perform this experiment individually.
2. Implement DDL commands for the assigned system.

Deliverables/Solution:

Creating Database for hotel management:

```
mysql> create database hotel
    -> ;
ERROR 1007 (HY000): Can't create database 'hotel'; database exists
mysql> create database hotel;
ERROR 1007 (HY000): Can't create database 'hotel'; database exists
```

Use hotel and create table in it:

```
mysql> use hotel;
Database changed
mysql> create table customer(uid integer, bdate date, Fname char(10),Mname char(10), Lname char(10), gender char(1), phoneno integer);
Query OK, 0 rows affected (0.12 sec)
```

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Inserting 3 rows in table:

```
mysql> insert into customer(uid,bdate,Fname,Mname,Lname,gender,phoneno) values(123,20100101,"Boris","Antony","Edison","M", 123112123);
Query OK, 1 row affected (0.09 sec)

mysql> insert into customer(uid,bdate,Fname,Mname,Lname,gender,phoneno) values(123,20100101,"Alston","Antony","Edison","M", 123112123);

Query OK, 1 row affected (0.06 sec)

mysql> insert into customer(uid,bdate,Fname,Mname,Lname,gender,phoneno) values(123,20100101,"Bipin","Antony","Edison","M", 123112123);
Query OK, 1 row affected (0.01 sec)
```

Description customer: (view relational schema)

```
mysql> desc customer;
+---------+----------+------+-----+---------+-------+
| Field   | Type     | Null | Key | Default | Extra |
+---------+----------+------+-----+---------+-------+
| uid     | int      | YES  |     | NULL    |       |
| bdate   | date     | YES  |     | NULL    |       |
| Fname   | char(10) | YES  |     | NULL    |       |
| Mname   | char(10) | YES  |     | NULL    |       |
| Lname   | char(10) | YES  |     | NULL    |       |
| gender  | char(1)  | YES  |     | NULL    |       |
| phoneno | int      | YES  |     | NULL    |       |
+---------+----------+------+-----+---------+-------+
7 rows in set (0.01 sec)
```

View table:

```
mysql> select * from customer;
+------+------------+--------+--------+--------+--------+-----------+
| uid  | bdate      | Fname  | Mname  | Lname  | gender | phoneno   |
+------+------------+--------+--------+--------+--------+-----------+
|  123 | 2010-01-01 | Boris  | Antony | Edison | M      | 123112123 |
|  123 | 2010-01-01 | Alston | Antony | Edison | M      | 123112123 |
|  123 | 2010-01-01 | Bipin  | Antony | Edison | M      | 123112123 |
+------+------------+--------+--------+--------+--------+-----------+
3 rows in set (0.00 sec)
```

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Truncate (remove all the rows):

```
mysql> truncate table customer;
Query OK, 0 rows affected (0.20 sec)
```

```
mysql> select * from customer;
Empty set (0.00 sec)

mysql> desc customer;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | YES  |     | NULL    |       |
| bdate   | date        | YES  |     | NULL    |       |
| Fname   | char(10)    | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
| address | varchar(20) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

```
mysql> select * from customer;
+------+------------+-------+--------+--------+--------+-----------+---------+
| uid  | bdate      | Fname | Mname  | Lname  | gender | phoneno   | address |
+------+------------+-------+--------+--------+--------+-----------+---------+
|  123 | 2010-01-01 | Bipin | Antony | Edison | M      | 123112123 | NULL    |
+------+------------+-------+--------+--------+--------+-----------+---------+
1 row in set (0.00 sec)
```

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Rename:

```
mysql> rename table customer To cust;
Query OK, 0 rows affected (0.11 sec)

mysql> desc customer;
ERROR 1146 (42S02): Table 'hotel.customer' doesn't exist
mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | YES  |     | NULL    |       |
| bdate   | date        | YES  |     | NULL    |       |
| Fname   | char(10)    | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
| address | varchar(20) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

Modify datatype of fname from char to varchar:

```
mysql> alter table cust
    -> modify column Fname varchar(20);
Query OK, 1 row affected (0.24 sec)
Records: 1  Duplicates: 0  Warnings: 0

mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | YES  |     | NULL    |       |
| bdate   | date        | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
| address | varchar(20) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)

mysql> select * from cust;
+------+------------+-------+--------+--------+--------+-----------+---------+
| uid  | bdate      | Fname | Mname  | Lname  | gender | phoneno   | address |
+------+------------+-------+--------+--------+--------+-----------+---------+
|  123 | 2010-01-01 | Bipin | Antony | Edison | M      | 123112123 | NULL    |
+------+------------+-------+--------+--------+--------+-----------+---------+
1 row in set (0.00 sec)
```

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Modify datatype of bdate from date to integer:

```
mysql> alter table cust
    -> modify column bdate integer;
Query OK, 2 rows affected (0.28 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> desc cust
    -> ;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | YES  |     | NULL    |       |
| bdate   | int         | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
| address | varchar(20) | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

Inserting and deleting element from table:

```
mysql> insert into cust(uid,bdate,Fname,Mname,Lname,gender,phoneno) values(123,'2010dec01',"4654dgfd","Antony","Edison","M", 123112123)
;
Query OK, 1 row affected (0.06 sec)

mysql> select * from cust;
+------+------------+---------+--------+--------+--------+-----------+
| uid  | bdate      | Fname   | Mname  | Lname  | gender | phoneno   |
+------+------------+---------+--------+--------+--------+-----------+
|  123 | 2010-01-01 | 4654dgfd | Antony | Edison | M      | 123112123 |
|  123 | 2010-12-01 | 4654dgfd | Antony | Edison | M      | 123112123 |
|  123 | 2010dec01  | 4654dgfd | Antony | Edison | M      | 123112123 |
+------+------------+---------+--------+--------+--------+-----------+
3 rows in set (0.00 sec)
```

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```
mysql> DELETE FROM cust WHERE date = '2010dec01';
ERROR 1054 (42S22): Unknown column 'date' in 'where clause'
mysql> DELETE FROM cust WHERE bdate = '2010dec01';
Query OK, 1 row affected (0.07 sec)

mysql> select * cust;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right
syntax to use near 'cust' at line 1
mysql> select * from cust;
+------+------------+----------+--------+--------+--------+-----------+
| uid  | bdate      | Fname    | Mname  | Lname  | gender | phoneno   |
+------+------------+----------+--------+--------+--------+-----------+
|  123 | 2010-01-01 | 4654dgfd | Antony | Edison | M      | 123112123 |
|  123 | 2010-12-01 | 4654dgfd | Antony | Edison | M      | 123112123 |
+------+------------+----------+--------+--------+--------+-----------+
2 rows in set (0.00 sec)
```

Conclusion: able to create database structures using DDL commands.

Database Management System Lab

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EXPERIMENT NO.: 4

Aim: Populate database using DML commands for the assigned system.

Objective: Execute all Data Manipulation Language commands and manage the content of the database.

Outcome:

Student should be able to:

-Explain the use of DML commands.

-Insert, delete, update and extract the data from the database by applying these commands.

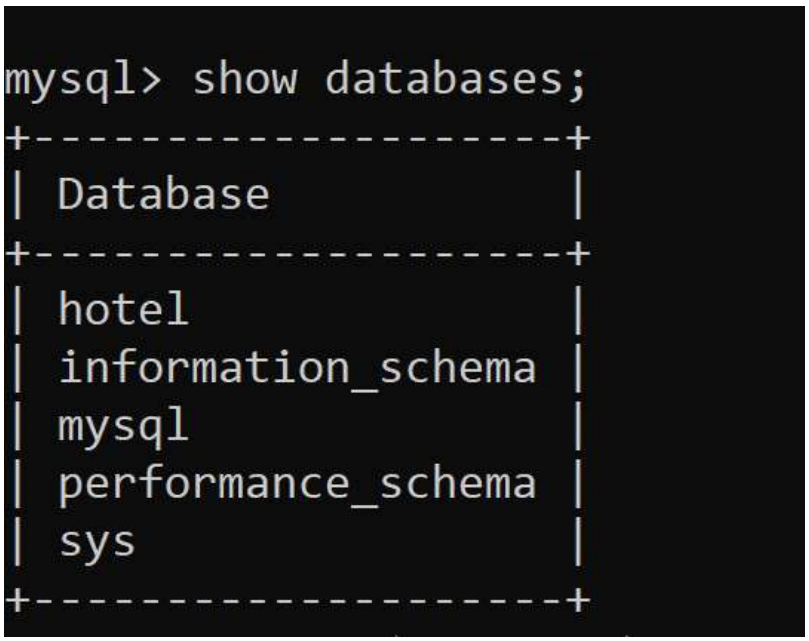
- Manage the content of the database.

Instructions:

1. This experiment is a compulsory experiment. All the students are required to perform this experiment individually.
2. Implement DML commands for the assigned system.

Solution:

Show Databases



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Create table Staff

```
mysql> create table Staff(uid int, Fname char(10), Lname char(10), department varchar(20),phno int);
Query OK, 0 rows affected (0.10 sec)
```

Desc of Staff table:

```
ERROR 1146 (42S02): Table 'hotel.staff' doesn't exist
mysql> desc Staff;
+------------+-------------+------+-----+---------+-------+
| Field      | Type        | Null | Key | Default | Extra |
+------------+-------------+------+-----+---------+-------+
| uid        | int         | YES  |     | NULL    |       |
| Fname      | char(10)    | YES  |     | NULL    |       |
| Lname      | char(10)    | YES  |     | NULL    |       |
| department | varchar(20) | YES  |     | NULL    |       |
| phno       | int         | YES  |     | NULL    |       |
+------------+-------------+------+-----+---------+-------+
```

Inserting 1 row and checking it:

```
mysql> insert into Staff values (19992,"Santosh","Patil","Reception", 987756);
Query OK, 1 row affected (0.06 sec)

mysql> select * from Staff
    -> ;
+-------+---------+-------+------------+--------+
| uid   | Fname   | Lname | department | phno   |
+-------+---------+-------+------------+--------+
| 19992 | Santosh | Patil | Reception  | 987756 |
+-------+---------+-------+------------+--------+
1 row in set (0.00 sec)
```

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Inserting another row

```
mysql> insert into Staff values (19827,"Fernando","Alonso","Cook",9876457)
    -> ;
Query OK, 1 row affected (0.01 sec)

mysql> select * from Staff;
+-------+----------+--------+------------+---------+
| uid   | Fname    | Lname  | department | phno    |
+-------+----------+--------+------------+---------+
| 19992 | Santosh  | Patil  | Reception  |  987756 |
| 19827 | Fernando | Alonso | Cook       | 9876457 |
+-------+----------+--------+------------+---------+
2 rows in set (0.00 sec)
```

```
mysql> insert into Staff (uid,Fname,phno) values(18273,"Daniel",8746272);
Query OK, 1 row affected (0.05 sec)

mysql> select * from Staff;
+-------+----------+--------+------------+---------+
| uid   | Fname    | Lname  | department | phno    |
+-------+----------+--------+------------+---------+
| 19992 | Santosh  | Patil  | Reception  |  987756 |
| 19827 | Fernando | Alonso | Cook       | 9876457 |
| 18273 | Daniel   | NULL   | NULL       | 8746272 |
+-------+----------+--------+------------+---------+
3 rows in set (0.00 sec)
```

Update: updating Lname

```
mysql> update Staff set Lname = "Ricciardo", department = "management" where uid=18273;
Query OK, 1 row affected (0.06 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from Staff;
+-------+----------+-----------+------------+---------+
| uid   | Fname    | Lname     | department | phno    |
+-------+----------+-----------+------------+---------+
| 19992 | Santosh  | Patil     | Reception  |  987756 |
| 19827 | Fernando | Alonso    | Cook       | 9876457 |
| 18273 | Daniel   | Ricciardo | management | 8746272 |
+-------+----------+-----------+------------+---------+
3 rows in set (0.00 sec)
```

Database Management System Lab

Bipin Giri

Roll no. 19

Inserting rows with duplicate values:

```
mysql> insert into Staff (uid,Fname,phno) values(182243,"Charles",98746272);
Query OK, 1 row affected (0.06 sec)

mysql> insert into Staff (uid,Fname,phno) values(9683,"Lewis",1928746272),(5362,"George",7652271);
Query OK, 2 rows affected (0.05 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from Staff;
+--------+---------+-----------+------------+------------+
| uid    | Fname   | Lname     | department | phno       |
+--------+---------+-----------+------------+------------+
|  19992 | Santosh | Patil     | Reception  |     987756 |
|  19827 | Fernando| Alonso    | Cook       |    9876457 |
|  18273 | Daniel  | Ricciardo | management |    8746272 |
| 182243 | Charles | NULL      | NULL       |   98746272 |
|   9683 | Lewis   | NULL      | NULL       | 1928746272 |
|   5362 | George  | NULL      | NULL       |    7652271 |
+--------+---------+-----------+------------+------------+
6 rows in set (0.00 sec)
```

Extracting data based on condition:

```
mysql> select uid from Staff where department = "management";
+-------+
| uid   |
+-------+
| 18273 |
+-------+
```

```
mysql> select uid from Staff where department is NULL;
+--------+
| uid    |
+--------+
| 182243 |
|   9683 |
|   5362 |
+--------+
3 rows in set (0.00 sec)
```

```
mysql> select uid,Fname,Lname from Staff where department is NULL;
+--------+---------+-------+
| uid    | Fname   | Lname |
+--------+---------+-------+
| 182243 | Charles | NULL  |
|   9683 | Lewis   | NULL  |
|   5362 | George  | NULL  |
+--------+---------+-------+
3 rows in set (0.00 sec)
```

Like

```
mysql> select uid,Fname,Lname from Staff where department LIKE "m%";
+-------+--------+-----------+
| uid   | Fname  | Lname     |
+-------+--------+-----------+
| 18273 | Daniel | Ricciardo |
+-------+--------+-----------+
1 row in set (0.01 sec)
```

```
mysql> select uid,Fname,Lname from Staff where department LIKE "_e%";
+-------+---------+-------+
| uid   | Fname   | Lname |
+-------+---------+-------+
| 19992 | Santosh | Patil |
+-------+---------+-------+
1 row in set (0.00 sec)
```

Database Management System Lab

Bipin Giri

Roll no. 19

Using IN and Not in

```
mysql> select Fname
    -> from Staff
    -> where uid in (19992,18273)
    -> ;
+---------+
| Fname   |
+---------+
| Santosh |
| Daniel  |
+---------+
2 rows in set (0.00 sec)
```

```
mysql> select Fname from Staff where uid not in (19992,18273);
+----------+
| Fname    |
+----------+
| Fernando |
| Charles  |
| Lewis    |
| George   |
+----------+
4 rows in set (0.00 sec)
```

Order by:

```
mysql> select * from Staff order by uid asc;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
|   5362 | George   | NULL      | NULL       |    7652271 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  19992 | Santosh  | Patil     | Reception  |     987756 |
| 182243 | Charles  | NULL      | NULL       |   98746272 |
+--------+----------+-----------+------------+------------+
6 rows in set (0.00 sec)
```

Database Management System Lab

Bipin Giri

Roll no. 19

```
mysql> select * from Staff order by Fname asc;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
| 182243 | Charles  | NULL      | NULL       |   98746272 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|   5362 | George   | NULL      | NULL       |    7652271 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|  19992 | Santosh  | Patil     | Reception  |     987756 |
+--------+----------+-----------+------------+------------+
6 rows in set (0.00 sec)
```

```
mysql> select * from Staff order by Fname desc;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
|  19992 | Santosh  | Patil     | Reception  |     987756 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
| 182243 | Charles  | NULL      | NULL       |   98746272 |
+--------+----------+-----------+------------+------------+
6 rows in set (0.01 sec)

mysql> select * from Staff order by uid desc;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
| 182243 | Charles  | NULL      | NULL       |   98746272 |
|  19992 | Santosh  | Patil     | Reception  |     987756 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
+--------+----------+-----------+------------+------------+
```

Database Management System Lab

Bipin Giri

Roll no. 19

Inserting Duplicate values:

```
mysql> insert into Staff (uid,Fname,phno) values(9683,"Lewis",1928746272),(5362,"George",7652271);
Query OK, 2 rows affected (0.06 sec)
Records: 2  Duplicates: 0  Warnings: 0
```

```
mysql> select  * from Staff;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
|  19992 | Santosh  | Patil     | Reception  |     987756 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
| 182243 | Charles  | NULL      | NULL       |   98746272 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
+--------+----------+-----------+------------+------------+
8 rows in set (0.00 sec)
```

Extracting only distinct values:

```
mysql> select distinct *  from Staff order by uid desc;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
| 182243 | Charles  | NULL      | NULL       |   98746272 |
|  19992 | Santosh  | Patil     | Reception  |     987756 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
+--------+----------+-----------+------------+------------+
6 rows in set (0.00 sec)
```

Database Management System Lab

Bipin Giri

Roll no. 19

Deleting rows from table

```
mysql> select * from Staff;
+--------+----------+-----------+------------+------------+
| uid    | Fname    | Lname     | department | phno       |
+--------+----------+-----------+------------+------------+
|  19992 | Santosh  | Patil     | Reception  |     987756 |
|  19827 | Fernando | Alonso    | Cook       |    9876457 |
|  18273 | Daniel   | Ricciardo | management |    8746272 |
| 182243 | Charles  | NULL      | NULL       |   98746272 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
|   9683 | Lewis    | NULL      | NULL       | 1928746272 |
|   5362 | George   | NULL      | NULL       |    7652271 |
+--------+----------+-----------+------------+------------+
8 rows in set (0.00 sec)

mysql> delete from Staff where department is NULL;
Query OK, 5 rows affected (0.02 sec)

mysql> select * from Staff
    -> ;
+-------+----------+-----------+------------+---------+
| uid   | Fname    | Lname     | department | phno    |
+-------+----------+-----------+------------+---------+
| 19992 | Santosh  | Patil     | Reception  |  987756 |
| 19827 | Fernando | Alonso    | Cook       | 9876457 |
| 18273 | Daniel   | Ricciardo | management | 8746272 |
+-------+----------+-----------+------------+---------+
3 rows in set (0.00 sec)

mysql>
```

Conclusion: able to manage the content of the database using DML commands.

Database Management System Lab

Bipin Giri Roll no. 19

Experiment 5

Aim: Apply Integrity Constraints for the specified system.

Prerequisite: Knowledge of SQL syntax.

Mapping With COs: CSL402.2, CSL402.3

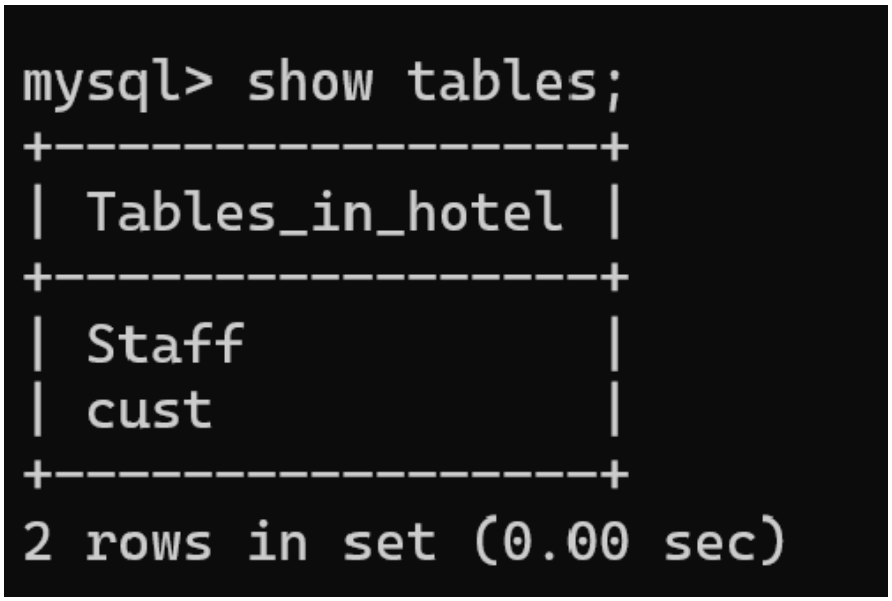
Objective: To implement restrictions on your assigned database (CONSTRAINTS).

Outcome: After completion of this lab, the student should be able to: - Create a simple table - Explain how constraints are created at the time of table creation - Explain the purpose of constraints in a table - Distinguish among PRIMARY KEY, FOREIGN KEY, UNIQUE, CHECK, and NOT NULL constraints and the appropriate use for each constraint - Explain how constraints can be created on an existing table - Create PRIMARY KEY constraints for a single column - Create a FOREIGN KEY constraint, UNIQUE constraint and CHECK constraint

Instructions:
1. This experiment is a compulsory experiments. All the students are required to perform this experiment individually.
2. Implement all the types of constraints for the assigned system.

Deliverables:

Showing all the created table:



```
mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | YES  |     | NULL    |       |
| bdate   | int         | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

Setting Not Null Constraint:

```
mysql> alter table cust
    -> modify column uid NOt null
    -> ;
```

```
mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | NO   |     | NULL    |       |
| bdate   | int         | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

Database Management System Lab

Bipin Giri Roll no. 19

Setting Check constraint :

```
mysql> alter table cust add check(uid>=0);
```

```
mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | NO   |     | NULL    |       |
| bdate   | int         | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

```
mysql> select * from cust;
+-----+-------+-------+--------+--------+--------+---------+
| uid | bdate | Fname | Mname  | Lname  | gender | phoneno |
+-----+-------+-------+--------+--------+--------+---------+
|  14 |    28 | Boris | Antony | Edison | M      |   98766 |
|  19 |  NULL | Bipin | Dinesh | Giri   | M      |    NULL |
+-----+-------+-------+--------+--------+--------+---------+
2 rows in set (0.00 sec)
```

```
mysql> insert into cust (uid) values ();
ERROR 1136 (21S01): Column count doesn't match value count at row 1
mysql> insert into cust (fname) values ("alston");
ERROR 1364 (HY000): Field 'uid' doesn't have a default value
mysql> insert into cust (uid,fname) values (19,"alston");
Query OK, 1 row affected (0.06 sec)
```

```
mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
|  19 |  NULL | alston | NULL   | NULL   | NULL   |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
3 rows in set (0.00 sec)
```

```
mysql> insert into cust (uid,fname) values (-1,"alston");
ERROR 3819 (HY000): Check constraint 'cust_chk_1' is violated.
mysql> delete from cust where Fname="alston";
Query OK, 1 row affected (0.06 sec)

mysql> insert into cust (uid,fname) values (16,"alston");
Query OK, 1 row affected (0.07 sec)
```

```
mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
|  16 |  NULL | alston | NULL   | NULL   | NULL   |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
3 rows in set (0.00 sec)
```

Setting Primary Key:

```
mysql> alter table cust primary key(uid);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQ
L server version for the right syntax to use near 'primary key(uid)' at line 1
mysql> alter table cust add primary key(uid);
Query OK, 0 rows affected (0.16 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> desc cust;
+---------+-------------+------+-----+---------+-------+
| Field   | Type        | Null | Key | Default | Extra |
+---------+-------------+------+-----+---------+-------+
| uid     | int         | NO   | PRI | NULL    |       |
| bdate   | int         | YES  |     | NULL    |       |
| Fname   | varchar(20) | YES  |     | NULL    |       |
| Mname   | char(10)    | YES  |     | NULL    |       |
| Lname   | char(10)    | YES  |     | NULL    |       |
| gender  | char(1)     | YES  |     | NULL    |       |
| phoneno | int         | YES  |     | NULL    |       |
+---------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

```
mysql> insert into cust (uid,fname) values (16,"Daniel");
ERROR 1062 (23000): Duplicate entry '16' for key 'cust.PRIMARY'
```

Creating new table em_contact For saving emergency contact details which is reffering to customer table for uid.

```
mysql> create table em_contact;
ERROR 4028 (HY000): A table must have at least one visible column.
mysql> create table em_contact (uid int, phone_no int, Fname char(20));
Query OK, 0 rows affected (0.16 sec)
```

Adding foreign key

```
mysql> alter table em_contact add foreign key (uid) references cust(uid);
Query OK, 0 rows affected (0.25 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> desc em_contact;
+----------+----------+------+-----+---------+-------+
| Field    | Type     | Null | Key | Default | Extra |
+----------+----------+------+-----+---------+-------+
| uid      | int      | YES  | MUL | NULL    |       |
| phone_no | int      | YES  |     | NULL    |       |
| Fname    | char(20) | YES  |     | NULL    |       |
+----------+----------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

```
mysql> select * from em_contact;
Empty set (0.00 sec)

mysql> insert into em_contact (uid,fname) values (18,"Daniel");
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails (`hotel`.`em_contac
t`, CONSTRAINT `em_contact_ibfk_1` FOREIGN KEY (`uid`) REFERENCES `cust` (`uid`))
mysql> insert into em_contact (uid,fname) values (14,"Daniel");
Query OK, 1 row affected (0.06 sec)
```

```
mysql> select * from em_contact;
+------+----------+--------+
| uid  | phone_no | Fname  |
+------+----------+--------+
|   14 |     NULL | Daniel |
+------+----------+--------+
1 row in set (0.01 sec)
```

Deleting value which is reffering to customer table.

```
mysql> delete from cust where uid= 14;
ERROR 1451 (23000): Cannot delete or update a parent row: a foreign key constrai
nt fails (`hotel`.`em_contact`, CONSTRAINT `em_contact_ibfk_1` FOREIGN KEY (`uid
`) REFERENCES `cust` (`uid`))
mysql> insert into cust (uid) values(45);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  16 |  NULL | alston | NULL   | NULL   | NULL   |    NULL |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
|  45 |  NULL | NULL   | NULL   | NULL   | NULL   |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
4 rows in set (0.00 sec)

mysql> delete from cust where uid = 45;
Query OK, 1 row affected (0.05 sec)

mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  16 |  NULL | alston | NULL   | NULL   | NULL   |    NULL |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
3 rows in set (0.00 sec)
```

Setting Unique constraint:

```
mysql> alter table cust modify column phoneno int unique;
Query OK, 0 rows affected (0.16 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  16 |  NULL | alston | NULL   | NULL   | NULL   |    NULL |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
3 rows in set (0.00 sec)
```

```
mysql> insert into cust (uid,phoneno) values (18,98766);
ERROR 1062 (23000): Duplicate entry '98766' for key 'cust.phoneno'
mysql> insert into cust (uid,phoneno) values (18,987667);
Query OK, 1 row affected (0.06 sec)
```

```
mysql> update cust set gender="M" where uid=16;
Query OK, 1 row affected (0.06 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from cust;
+-----+-------+--------+--------+--------+--------+---------+
| uid | bdate | Fname  | Mname  | Lname  | gender | phoneno |
+-----+-------+--------+--------+--------+--------+---------+
|  14 |    28 | Boris  | Antony | Edison | M      |   98766 |
|  16 |  NULL | alston | NULL   | NULL   | M      |    NULL |
|  18 |  NULL | NULL   | NULL   | NULL   | NULL   |  987667 |
|  19 |  NULL | Bipin  | Dinesh | Giri   | M      |    NULL |
+-----+-------+--------+--------+--------+--------+---------+
4 rows in set (0.00 sec)

mysql> delete from cust where uid=18;
Query OK, 1 row affected (0.07 sec)
```

Conclusion: Students will able to create and apply various constraints on database.

References:

1. https://www.mysqltutorial.org/mysql-update-data.aspx
2. https://www.w3schools.com/mysql/mysql_check.asp
3. https://www.javatpoint.com/dbms-integrity-constraints#:~:text=The%20entity%20integrity%20constraint%20states,than%20the%20primary%20key%20field.

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**
Student: Bipin Giri **Roll no.: 19**

Experiment No: 6

Topic: Implement SQL Functions (string case and manipulation operations, Numeric, Date & Time functions), Group By and Order By clause.

Prerequisite: Knowledge of SQL syntax.

Mapping With COs: CSL402.2, CSL402.3

Objective:

-To explore and implement single-row functions and Aggregate functions available in SQL.
- To apply various functions within the query statement.
- Practice Queries using Single-row functions, Aggregate functions (COUNT, SUM, AVG, MAX and MIN)
- Apply ORDER BY, GROUP BY, and HAVING clause.

Outcome:

After completion of this lab, the student should be able to:
- Implement Single row functions in SQL statements
- Implement Aggregate functions in SQL statements
- Implement Order by, Group by and Having clause in SQL statements
- Explain and use SQL functions to manipulate dates, strings, and other data.
- Describe various types of functions available in SQL
- Use character, number, and date functions in SELECT statements
- Describe the use of conversion functions

Instructions:

- This experiment is a compulsory experiment. All the students are required to perform this experiment individually.
- Implement all the types of single row and multiple row functions. Implement Group By and having clauses. Also implement Nested Grouping and nested aggregate functions.

Deliverables:

- List down all Single row functions and Aggregate functions which you implemented during the lab session.
- Implement all the types of single row and multiple row functions.
- Implement Group By and having clauses.
- Implement Nested Grouping.
- Implement Nested aggregate functions.
- Implement Order by clause.

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**
Student: Bipin Giri **Roll no.: 19**

1. Single row functions:

Case manipulation

.Upper-case()
i.Lower-case()
ii.Initcap()

Character manipulation

iii.concat()
iv.substr()
v.length()
vi.instr()
vii.lpad()
viii.rpad()
ix.replace()
x.trim()
xi.round()
xii.Trunc()
xiii.mod()
xiv.months_between()
xv.add_months()
xvi.next_day()
xvii.last_day()

2. Multi row(Aggregate) functions:

a. avg()
b. min()
c. max()
d. sum()
e. count()

Output Screenshots:

Single row functions:

```
mysql> create table customer (uid int,fname char(10), lname char(10) , salary int );
Query OK, 0 rows affected (0.05 sec)
```

```
mysql> insert into customer values(14, "boris", "edison",20000),(16,"alston","fernandes",30000),(19,"bipin","giri",27000
),(70,"rohit","sharma",17000);
Query OK, 4 rows affected (0.05 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select * from customer;
+------+--------+-----------+--------+
| uid  | fname  | lname     | salary |
+------+--------+-----------+--------+
|   14 | boris  | edison    |  20000 |
|   16 | alston | fernandes |  30000 |
|   19 | bipin  | giri      |  27000 |
|   70 | rohit  | sharma    |  17000 |
+------+--------+-----------+--------+
4 rows in set (0.00 sec)
```

```
mysql> select upper(fname),lower(lname) from customer;
+--------------+--------------+
| upper(fname) | lower(lname) |
+--------------+--------------+
| BORIS        | edison       |
| ALSTON       | fernandes    |
| BIPIN        | giri         |
| ROHIT        | sharma       |
+--------------+--------------+
4 rows in set (0.01 sec)
```

```
mysql> update customer set fname='   Bipin' , lname='giri     ' where  uid=19;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> select * from customer;
+------+----------+-----------+--------+
| uid  | fname    | lname     | salary |
+------+----------+-----------+--------+
|   14 | boris    | edison    |  20000 |
|   16 | alston   | fernandes |  30000 |
|   19 |    Bipin | giri      |  27000 |
|   70 | rohit    | sharma    |  17000 |
+------+----------+-----------+--------+
4 rows in set (0.01 sec)
```

```
mysql> select concat (fname, lname) from customer;
+----------------------+
| concat (fname, lname) |
+----------------------+
| borisedison          |
| alstonfernandes      |
|    Bipingiri         |
| rohitsharma          |
+----------------------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select substr(fname,1,4) , instr(fname,'a') from customer;
+------------------+-----------------+
| substr(fname,1,4) | instr(fname,'a') |
+------------------+-----------------+
| bori              |               0 |
| alst              |               1 |
|    B              |               0 |
| rohi              |               0 |
+------------------+-----------------+
4 rows in set (0.01 sec)
```

```
mysql> select fname,lname,length(fname),length(lname) from customer;
+---------+----------+--------------+--------------+
| fname   | lname    | length(fname) | length(lname) |
+---------+----------+--------------+--------------+
| boris   | edison   |             5 |             6 |
| alston  | fernandes |            6 |             9 |
|    Bipin | giri    |             8 |             4 |
| rohit   | sharma   |             5 |             6 |
+---------+----------+--------------+--------------+
4 rows in set (0.00 sec)
```

```
mysql> select ltrim(fname),rtrim(lname) from customer;
+--------------+--------------+
| ltrim(fname) | rtrim(lname) |
+--------------+--------------+
| boris        | edison       |
| alston       | fernandes    |
| Bipin        | giri         |
| rohit        | sharma       |
+--------------+--------------+
4 rows in set (0.01 sec)
```

```
mysql> select trim(fname),trim(lname) from customer;
+-------------+-------------+
| trim(fname) | trim(lname) |
+-------------+-------------+
| boris       | edison      |
| alston      | fernandes   |
| Bipin       | giri        |
| rohit       | sharma      |
+-------------+-------------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select left(fname,4) , right (lname,4) from customer;
+---------------+----------------+
| left(fname,4) | right (lname,4) |
+---------------+----------------+
| bori          | ison           |
| alst          | ndes           |
|    B          | giri           |
| rohi          | arma           |
+---------------+----------------+
4 rows in set (0.00 sec)
```

```
mysql> select position('i' in fname) from customer;
+-----------------------+
| position('i' in fname) |
+-----------------------+
|                     4 |
|                     0 |
|                     5 |
|                     4 |
+-----------------------+
4 rows in set (0.00 sec)
```

```
mysql> select fname,lname,char(salary) from customer;
+----------+-----------+----------------------------+
| fname    | lname     | char(salary)               |
+----------+-----------+----------------------------+
| boris    | edison    | 0x4E20                     |
| alston   | fernandes | 0x7530                     |
|    Bipin | giri      | 0x6978                     |
| rohit    | sharma    | 0x4268                     |
+----------+-----------+----------------------------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select fname,lname, round(salary+0.257,-1) from customer;
+---------+----------+-----------------------+
| fname   | lname    | round(salary+0.257,-1) |
+---------+----------+-----------------------+
| boris   | edison   |                 20000 |
| alston  | fernandes |                 30000 |
|    Bipin | giri     |                 27000 |
| rohit   | sharma   |                 17000 |
+---------+----------+-----------------------+
4 rows in set (0.00 sec)

mysql> select fname,lname, round(salary+0.257,1) from customer;
+---------+----------+----------------------+
| fname   | lname    | round(salary+0.257,1) |
+---------+----------+----------------------+
| boris   | edison   |              20000.3 |
| alston  | fernandes |              30000.3 |
|    Bipin | giri     |              27000.3 |
| rohit   | sharma   |              17000.3 |
+---------+----------+----------------------+
4 rows in set (0.00 sec)
```

```
mysql> select fname,lname,truncate(salary,-2) from customer;
+---------+----------+---------------------+
| fname   | lname    | truncate(salary,-2) |
+---------+----------+---------------------+
| boris   | edison   |               20000 |
| alston  | fernandes |               30000 |
|    Bipin | giri     |               27000 |
| rohit   | sharma   |               17000 |
+---------+----------+---------------------+
4 rows in set (0.00 sec)

mysql> select fname,lname,truncate(salary,-10) from customer;
+---------+----------+----------------------+
| fname   | lname    | truncate(salary,-10) |
+---------+----------+----------------------+
| boris   | edison   |                    0 |
| alston  | fernandes |                    0 |
|    Bipin | giri     |                    0 |
| rohit   | sharma   |                    0 |
+---------+----------+----------------------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select fname,lname,truncate(salary,-4) from customer;
+----------+-----------+---------------------+
| fname    | lname     | truncate(salary,-4) |
+----------+-----------+---------------------+
| boris    | edison    |               20000 |
| alston   | fernandes |               30000 |
|    Bipin | giri      |               20000 |
| rohit    | sharma    |               10000 |
+----------+-----------+---------------------+
4 rows in set (0.00 sec)
```

```
mysql> select rpad(fname,10,'+')  from customer;
+--------------------+
| rpad(fname,10,'+') |
+--------------------+
| boris+++++         |
| alston++++         |
|    Bipin++         |
| rohit+++++         |
+--------------------+
4 rows in set (0.00 sec)

mysql> select rpad(fname,10,'+'), lpad(lname,12,'+') from customer;
+--------------------+--------------------+
| rpad(fname,10,'+') | lpad(lname,12,'+') |
+--------------------+--------------------+
| boris+++++         | ++++++edison       |
| alston++++         | +++fernandes       |
|    Bipin++         | ++++++++giri       |
| rohit+++++         | ++++++sharma       |
+--------------------+--------------------+
4 rows in set (0.00 sec)
```

```
mysql> select concat(rpad(fname,10,'+'), lpad(lname,12,'+')) from customer;
+-----------------------------------------------+
| concat(rpad(fname,10,'+'), lpad(lname,12,'+')) |
+-----------------------------------------------+
| boris++++++++++edison                         |
| alston+++++++fernandes                        |
|    Bipin++++++++++giri                        |
| rohit++++++++++sharma                         |
+-----------------------------------------------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select fname,mod(salary,12) from customer;
+----------+----------------+
| fname    | mod(salary,12) |
+----------+----------------+
| boris    |              8 |
| alston   |              0 |
|    Bipin |              0 |
| rohit    |              8 |
+----------+----------------+
4 rows in set (0.01 sec)
```

```
mysql> SELECT DATEDIFF("2017-06-25", "2017-06-15");
+--------------------------------------+
| DATEDIFF("2017-06-25", "2017-06-15") |
+--------------------------------------+
|                                   10 |
+--------------------------------------+
1 row in set (0.00 sec)

mysql> SELECT DATEDIFF("2017-06-25 09:34:21", "2017-06-15 15:25:35") days_between;
+--------------+
| days_between |
+--------------+
|           10 |
+--------------+
1 row in set (0.00 sec)
```

```
mysql> SELECT MONTHNAME("2017-06-15");
+-------------------------+
| MONTHNAME("2017-06-15") |
+-------------------------+
| June                    |
+-------------------------+
1 row in set (0.01 sec)
```

```
mysql> select last_day(curdate());
+--------------------+
| last_day(curdate()) |
+--------------------+
| 2022-03-31         |
+--------------------+
1 row in set (0.01 sec)
```

```
mysql> SELECT DATE_ADD("2020-9-22", INTERVAL 2 MONTH);
+-----------------------------------------+
| DATE_ADD("2020-9-22", INTERVAL 2 MONTH) |
+-----------------------------------------+
| 2020-11-22                              |
+-----------------------------------------+
1 row in set (0.01 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> SELECT DATE_ADD("2020-11-12", INTERVAL 10 DAY);
+----------------------------------------+
| DATE_ADD("2020-11-12", INTERVAL 10 DAY) |
+----------------------------------------+
| 2020-11-22                             |
+----------------------------------------+
1 row in set (0.01 sec)

mysql> SELECT DATE_ADD("2020-11-22 06:12:10", INTERVAL 3 HOUR);
+-------------------------------------------------+
| DATE_ADD("2020-11-22 06:12:10", INTERVAL 3 HOUR) |
+-------------------------------------------------+
| 2020-11-22 09:12:10                             |
+-------------------------------------------------+
1 row in set (0.00 sec)

mysql> SELECT DATE_ADD("2020-11-22 09:06:10", INTERVAL 3 MINUTE);
+---------------------------------------------------+
| DATE_ADD("2020-11-22 09:06:10", INTERVAL 3 MINUTE) |
+---------------------------------------------------+
| 2020-11-22 09:09:10                               |
+---------------------------------------------------+
1 row in set (0.00 sec)
```

```
mysql> SELECT "2020-11-22" + 1 ;
+------------------+
| "2020-11-22" + 1 |
+------------------+
|             2021 |
+------------------+
1 row in set, 1 warning (0.00 sec)

mysql> SELECT month("2020-11-22") + 1 ;
+--------------------------+
| month("2020-11-22") + 1 |
+--------------------------+
|                       12 |
+--------------------------+
1 row in set (0.01 sec)
```

```
mysql> select curdate() + 1;
+---------------+
| curdate() + 1 |
+---------------+
|      20220325 |
+---------------+
1 row in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

Aggregate functions:

```
mysql> show tables;
+-----------------+
| Tables_in_Hotel |
+-----------------+
| customer        |
+-----------------+
1 row in set (0.00 sec)
```

```
mysql> create table Employee(uid int , fname char(20) , salary int);
Query OK, 0 rows affected (0.73 sec)

mysql> desc Employee
    -> ;
+--------+----------+------+-----+---------+-------+
| Field  | Type     | Null | Key | Default | Extra |
+--------+----------+------+-----+---------+-------+
| uid    | int(11)  | YES  |     | NULL    |       |
| fname  | char(20) | YES  |     | NULL    |       |
| salary | int(11)  | YES  |     | NULL    |       |
+--------+----------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> insert into Employee values(2020,'rohit',30000)
    -> ;
```

```
mysql> select * from Employee;
+------+-------+--------+
| uid  | fname | salary |
+------+-------+--------+
| 2020 | rohit |  30000 |
+------+-------+--------+
1 row in set (0.00 sec)
```

```
mysql> insert into Employee values(2021, 'Rohan' ,40000);
Query OK, 1 row affected (0.08 sec)

mysql> insert into Employee values(3021, 'Joe' ,40000),(2023,'Kevin' , 56000);
Query OK, 2 rows affected (0.10 sec)
Records: 2  Duplicates: 0  Warnings: 0
```

```
mysql> alter table Employee
    -> Add dept_name char(20);
Query OK, 0 rows affected (1.73 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**
Student: Bipin Giri **Roll no.: 19**

```
mysql> desc Employee
    -> ;
+-----------+----------+------+-----+---------+-------+
| Field     | Type     | Null | Key | Default | Extra |
+-----------+----------+------+-----+---------+-------+
| uid       | int(11)  | YES  |     | NULL    |       |
| fname     | char(20) | YES  |     | NULL    |       |
| salary    | int(11)  | YES  |     | NULL    |       |
| dept_name | char(20) | YES  |     | NULL    |       |
+-----------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> update Employee set dept_name = 'comp' where fname='rohit';
Query OK, 1 row affected (0.14 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from Employee;
+------+-------+--------+-----------+
| uid  | fname | salary | dept_name |
+------+-------+--------+-----------+
| 2020 | rohit |  30000 | comp      |
| 2021 | Rohan |  40000 | NULL      |
| 3021 | Joe   |  40000 | NULL      |
| 2023 | Kevin |  56000 | NULL      |
+------+-------+--------+-----------+
4 rows in set (0.00 sec)
```

```
mysql> update Employee set dept_name='Extc' where fname ='Joe' or fname='Kevin';
Query OK, 2 rows affected (0.09 sec)
Rows matched: 2  Changed: 2  Warnings: 0

mysql> update Employee set dept_name='comp' where fname ='Rohan';
Query OK, 1 row affected (0.12 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from Employee;
+------+-------+--------+-----------+
| uid  | fname | salary | dept_name |
+------+-------+--------+-----------+
| 2020 | rohit |  30000 | comp      |
| 2021 | Rohan |  40000 | comp      |
| 3021 | Joe   |  40000 | Extc      |
| 2023 | Kevin |  56000 | Extc      |
+------+-------+--------+-----------+
4 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> insert into Employee values(3031, 'Aniket' ,26000,'IT'),(2033,'Kelvin' ,
56000,'IT');
Query OK, 2 rows affected (0.10 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from Employee;
+------+--------+--------+-----------+
| uid  | fname  | salary | dept_name |
+------+--------+--------+-----------+
| 2020 | rohit  |  30000 | comp      |
| 2021 | Rohan  |  40000 | comp      |
| 3021 | Joe    |  40000 | Extc      |
| 2023 | Kevin  |  56000 | Extc      |
| 3031 | Aniket |  26000 | IT        |
| 2033 | Kelvin |  56000 | IT        |
+------+--------+--------+-----------+
6 rows in set (0.00 sec)
```

```
mysql> insert into Employee values(3031, 'David' ,28000,'comp'),(2333,'nick' , 660
Query OK, 2 rows affected (0.08 sec)
Records: 2  Duplicates: 0  Warnings: 0
```

```
mysql> select Distinct * from Employee;
+------+--------+--------+-----------+
| uid  | fname  | salary | dept_name |
+------+--------+--------+-----------+
| 2020 | rohit  |  30000 | comp      |
| 2021 | Rohan  |  40000 | comp      |
| 3021 | Joe    |  40000 | Extc      |
| 2023 | Kevin  |  56000 | Extc      |
| 3031 | Aniket |  26000 | IT        |
| 2033 | Kelvin |  56000 | IT        |
| 3031 | David  |  28000 | comp      |
| 2333 | nick   |  66000 | comp      |
+------+--------+--------+-----------+
8 rows in set (0.04 sec)
```

```
mysql> select uid,max(salary) from Employee
    -> group by uid
    -> having max(salary)>50000;
+------+-------------+
| uid  | max(salary) |
+------+-------------+
| 2023 |       56000 |
| 2033 |       56000 |
| 2333 |       66000 |
+------+-------------+
3 rows in set (0.04 sec)
```

```
mysql> select dept_name,max(salary)
    -> from Employee
    -> group by dept_name
    -> ;
+-----------+-------------+
| dept_name | max(salary) |
+-----------+-------------+
| comp      |       66000 |
| Extc      |       56000 |
| IT        |       56000 |
+-----------+-------------+
3 rows in set (0.02 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select dept_name,avg(salary) from Employee group by dept_name;
+-----------+-------------+
| dept_name | avg(salary) |
+-----------+-------------+
| comp      |  41000.0000 |
| Extc      |  48000.0000 |
| IT        |  41000.0000 |
+-----------+-------------+
3 rows in set (0.00 sec)
```

```
mysql> select dept_name,round(avg(salary)) from Employee group by dept_name;
+-----------+--------------------+
| dept_name | round(avg(salary)) |
+-----------+--------------------+
| comp      |              41000 |
| Extc      |              48000 |
| IT        |              41000 |
+-----------+--------------------+
3 rows in set (0.06 sec)
```

```
mysql> select dept_name,fname,max(salary) from Employee group by dept_name,fname;
+-----------+--------+-------------+
| dept_name | fname  | max(salary) |
+-----------+--------+-------------+
| comp      | David  |       28000 |
| comp      | nick   |       66000 |
| comp      | Rohan  |       40000 |
| comp      | rohit  |       30000 |
| Extc      | Joe    |       40000 |
| Extc      | Kevin  |       56000 |
| IT        | Aniket |       26000 |
| IT        | Kelvin |       56000 |
+-----------+--------+-------------+
8 rows in set (0.00 sec)
```

```
mysql> select dept_name,fname,max(salary) from Employee group by fname,dept_name ;
+-----------+--------+-------------+
| dept_name | fname  | max(salary) |
+-----------+--------+-------------+
| IT        | Aniket |       26000 |
| comp      | David  |       28000 |
| Extc      | Joe    |       40000 |
| IT        | Kelvin |       56000 |
| Extc      | Kevin  |       56000 |
| comp      | nick   |       66000 |
| comp      | Rohan  |       40000 |
| comp      | rohit  |       30000 |
+-----------+--------+-------------+
8 rows in set (0.00 sec)
```

```
mysql> select dept_name ,count(salary) from Employee group by dept_name having sum(salary)>100000 ;
+-----------+---------------+
| dept_name | count(salary) |
+-----------+---------------+
| comp      |             4 |
| IT        |             4 |
+-----------+---------------+
2 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Class: SE Comp**

Student: Bipin Giri **Roll no.: 19**

```
mysql> select * from Employee order by dept_name,salary ;
+------+--------+--------+-----------+
| uid  | fname  | salary | dept_name |
+------+--------+--------+-----------+
| 3031 | David  |  28000 | comp      |
| 2020 | rohit  |  30000 | comp      |
| 2021 | Rohan  |  40000 | comp      |
| 2333 | nick   |  66000 | comp      |
| 3021 | Joe    |  40000 | Extc      |
| 2023 | Kevin  |  56000 | Extc      |
| 3031 | Aniket |  26000 | IT        |
| 3031 | Aniket |  26000 | IT        |
| 2033 | Kelvin |  56000 | IT        |
| 2033 | Kelvin |  56000 | IT        |
+------+--------+--------+-----------+
10 rows in set (0.00 sec)
```

Conclusion: In this experiment, students will be able to use:

- Single row functions in SQL statements
- Aggregate functions in SQL statements
- Order by, Group by and Having clause in SQL statements

References: https://www.tutorialspoint.com/

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

Experiment No: 7

Topic: Perform Sub Queries, Nested Queries and Joins

Prerequisite: Knowledge of concepts sub query, nested query, Joins and SQL syntax.

Mapping With COs:

- Write simple and complex queries
- Apply views, joins and triggers for specific tasks.

Objective:

- To implement Subqueries, Nested Queries and Joins.
- Write different types of problems that can solve by:
  - Sub queries
  - Nested queries
  - Combine data across tables according to their system. (Implement JOIN)

Outcome:

- After completion of this lab, the students will understand and be able to do the following:
- Describe the types of problems that subqueries can solve.
- Sub queries are nested within a SELECT, INSERT, UPDATE, or DELETE statement.
- A subquery can be used inside the WHERE or HAVING clauses of the outer SELECT, INSERT, UPDATE, or DELETE statements.
- Build and execute sub query.
- Define and execute various types of joins

Instructions:

This experiment is a compulsory experiment. All the students are required to perform this experiment individually.

Deliverables:

- Implement Subqueries, Nested Queries and all the types of Joins for the assigned system. (All implemented queries with output snapshots)

Output Screenshots:

```
mysql> select * from employee
    -> ;
+------+---------+--------+---------------+
| uid  | Fname   | salary | department_id |
+------+---------+--------+---------------+
| 1234 | Boris   |   2000 | comp          |
|   19 | Bipin   |   3000 | comp          |
|   16 | Alston  |   4000 | comp          |
|   11 | Gouresh |   4000 | EXTC          |
|   38 | Shalen  |   4500 | EXTC          |
|   45 | Sakshi  |   4600 | EXTC          |
|   10 | Suhani  |   4300 | IT            |
|   13 | Erica   |   4400 | IT            |
|   45 | Shubham |   4700 | IT            |
+------+---------+--------+---------------+
9 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> desc employee;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| uid           | int         | YES  |     | NULL    |       |
| Fname         | varchar(20) | YES  |     | NULL    |       |
| salary        | int         | YES  |     | NULL    |       |
| department_id | varchar(10) | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
4 rows in set (0.01 sec)
```

```
mysql> alter table employee rename column department_id to d_name;
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> desc employee;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| uid    | int         | YES  |     | NULL    |       |
| Fname  | varchar(20) | YES  |     | NULL    |       |
| salary | int         | YES  |     | NULL    |       |
| d_name | varchar(10) | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
4 rows in set (0.01 sec)
```

```
mysql> select * from employee;
+------+---------+--------+--------+
| uid  | Fname   | salary | d_name |
+------+---------+--------+--------+
| 1234 | Boris   |   2000 | comp   |
|   19 | Bipin   |   3000 | comp   |
|   16 | Alston  |   4000 | comp   |
|   11 | Gouresh |   4000 | EXTC   |
|   38 | Shalen  |   4500 | EXTC   |
|   45 | Sakshi  |   4600 | EXTC   |
|   10 | Suhani  |   4300 | IT     |
|   13 | Erica   |   4400 | IT     |
|   45 | Shubham |   4700 | IT     |
+------+---------+--------+--------+
9 rows in set (0.00 sec)
```

```
mysql> create table department (d_name varchar(10), hod char(10), d_id int)
    -> ;
Query OK, 0 rows affected (0.15 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> insert into department values("comp","Sana Maam",1),("EXTC","Gejo Maam",2),("IT","Tayyab Sir",3);
Query OK, 3 rows affected (0.02 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from department;
+--------+-----------+------+
| d_name | hod       | d_id |
+--------+-----------+------+
| comp   | Sana Maam |    1 |
| EXTC   | Gejo Maam |    2 |
| IT     | Tayyab Sir |    3 |
+--------+-----------+------+
3 rows in set (0.00 sec)
```

```
mysql> update employee set uid=59 where salary=4700;
Query OK, 1 row affected (0.06 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> select * from employee;
+------+---------+--------+--------+
| uid  | Fname   | salary | d_name |
+------+---------+--------+--------+
| 1234 | Boris   |   2000 | comp   |
|   19 | Bipin   |   3000 | comp   |
|   16 | Alston  |   4000 | comp   |
|   11 | Gouresh |   4000 | EXTC   |
|   38 | Shalen  |   4500 | EXTC   |
|   45 | Sakshi  |   4600 | EXTC   |
|   10 | Suhani  |   4300 | IT     |
|   13 | Erica   |   4400 | IT     |
|   59 | Shubham |   4700 | IT     |
+------+---------+--------+--------+
9 rows in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name
    -> from employee
    -> where d_name = (select d_name from department where d_name="comp");
+------+--------+--------+
| uid  | Fname  | d_name |
+------+--------+--------+
|   16 | Alston | comp   |
|   19 | Bipin  | comp   |
| 1234 | Boris  | comp   |
+------+--------+--------+
3 rows in set (0.05 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select uid, Fname,d_name
    -> ,salary
    -> from employee
    -> where salary > (select avg(salary) from employee)
    -> ;
+-----+---------+--------+--------+
| uid | Fname   | d_name | salary |
+-----+---------+--------+--------+
|  10 | Suhani  | IT     |   4300 |
|  11 | Gouresh | EXTC   |   4000 |
|  13 | Erica   | IT     |   4400 |
|  16 | Alston  | comp   |   4000 |
|  38 | Shalen  | EXTC   |   4500 |
|  45 | Sakshi  | EXTC   |   4600 |
|  59 | Shubham | IT     |   4700 |
+-----+---------+--------+--------+
7 rows in set (0.05 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary < (select avg(salary) from employee);
+------+-------+--------+--------+
| uid  | Fname | d_name | salary |
+------+-------+--------+--------+
|   19 | Bipin | comp   |   3000 |
| 1234 | Boris | comp   |   2000 |
+------+-------+--------+--------+
2 rows in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary in  (select avg(salary) from employee group by d_name);
+-----+-------+--------+--------+
| uid | Fname | d_name | salary |
+-----+-------+--------+--------+
|  19 | Bipin | comp   |   3000 |
+-----+-------+--------+--------+
1 row in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary in  (select max(salary) from employee group by d_name);
+-----+---------+-------+--------+
| uid | Fname   | d_name | salary |
+-----+---------+-------+--------+
|  11 | Gouresh | EXTC   |   4000 |
|  16 | Alston  | comp   |   4000 |
|  45 | Sakshi  | EXTC   |   4600 |
|  59 | Shubham | IT     |   4700 |
+-----+---------+-------+--------+
4 rows in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary in  (select max(salary) from employee);
+-----+---------+--------+--------+
| uid | Fname   | d_name | salary |
+-----+---------+--------+--------+
|  59 | Shubham | IT     |   4700 |
+-----+---------+--------+--------+
1 row in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select uid, Fname,d_name ,salary from employee where salary <  any  (select avg(salary) from employee group by d_name);

+------+---------+--------+--------+
| uid  | Fname   | d_name | salary |
+------+---------+--------+--------+
|   10 | Suhani  | IT     |   4300 |
|   11 | Gouresh | EXTC   |   4000 |
|   13 | Erica   | IT     |   4400 |
|   16 | Alston  | comp   |   4000 |
|   19 | Bipin   | comp   |   3000 |
| 1234 | Boris   | comp   |   2000 |
+------+---------+--------+--------+
6 rows in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary < all  (select avg(salary) from employee group by d_name);
+------+-------+--------+--------+
| uid  | Fname | d_name | salary |
+------+-------+--------+--------+
| 1234 | Boris | comp   |   2000 |
+------+-------+--------+--------+
1 row in set (0.00 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary > all  (select avg(salary) from employee group by d_name);
+-----+---------+--------+--------+
| uid | Fname   | d_name | salary |
+-----+---------+--------+--------+
|  38 | Shalen  | EXTC   |   4500 |
|  45 | Sakshi  | EXTC   |   4600 |
|  59 | Shubham | IT     |   4700 |
+-----+---------+--------+--------+
3 rows in set (0.01 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where salary <  any  (select avg(salary) from employee group by d_name)
    -> order by salary;
+------+---------+--------+--------+
| uid  | Fname   | d_name | salary |
+------+---------+--------+--------+
| 1234 | Boris   | comp   |   2000 |
|   19 | Bipin   | comp   |   3000 |
|   11 | Gouresh | EXTC   |   4000 |
|   16 | Alston  | comp   |   4000 |
|   10 | Suhani  | IT     |   4300 |
|   13 | Erica   | IT     |   4400 |
+------+---------+--------+--------+
6 rows in set (0.02 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where d_name = (select d_name from department where d_name like '%o%');
+------+--------+--------+--------+
| uid  | Fname  | d_name | salary |
+------+--------+--------+--------+
|   16 | Alston | comp   |   4000 |
|   19 | Bipin  | comp   |   3000 |
| 1234 | Boris  | comp   |   2000 |
+------+--------+--------+--------+
3 rows in set (0.01 sec)
```

```
mysql> select uid, Fname,d_name ,salary from employee where d_name = (select d_name from department where d_name like '%o%')
    -> order by uid;
+------+--------+--------+--------+
| uid  | Fname  | d_name | salary |
+------+--------+--------+--------+
|   16 | Alston | comp   |   4000 |
|   19 | Bipin  | comp   |   3000 |
| 1234 | Boris  | comp   |   2000 |
+------+--------+--------+--------+
3 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select uid, Fname,d_name ,salary from employee where d_name = (select d_name from department where d_name like '%o%')
order by uid desc;
+------+-------+-------+--------+
| uid  | Fname | d_name | salary |
+------+-------+-------+--------+
| 1234 | Boris | comp   |   2000 |
|   19 | Bipin | comp   |   3000 |
|   16 | Alston | comp  |   4000 |
+------+-------+-------+--------+
3 rows in set (0.01 sec)
```

```
mysql> select e.Fname, e.uid,e.d_name,d.hod from employee e join department d on (e.d_name = d.d_name);
+---------+------+-------+-----------+
| Fname   | uid  | d_name | hod       |
+---------+------+-------+-----------+
| Alston  |   16 | comp   | Sana Maam |
| Bipin   |   19 | comp   | Sana Maam |
| Boris   | 1234 | comp   | Sana Maam |
| Gouresh |   11 | EXTC   | Gejo Maam |
| Shalen  |   38 | EXTC   | Gejo Maam |
| Sakshi  |   45 | EXTC   | Gejo Maam |
| Suhani  |   10 | IT     | Tayyab Sir |
| Erica   |   13 | IT     | Tayyab Sir |
| Shubham |   59 | IT     | Tayyab Sir |
+---------+------+-------+-----------+
9 rows in set (0.00 sec)
```

```
mysql> select * from employee natural join department;
+--------+------+---------+--------+------------+------+
| d_name | uid  | Fname   | salary | hod        | d_id |
+--------+------+---------+--------+------------+------+
| comp   |   16 | Alston  |   4000 | Sana Maam  |    1 |
| comp   |   19 | Bipin   |   3000 | Sana Maam  |    1 |
| comp   | 1234 | Boris   |   2000 | Sana Maam  |    1 |
| EXTC   |   11 | Gouresh |   4000 | Gejo Maam  |    2 |
| EXTC   |   38 | Shalen  |   4500 | Gejo Maam  |    2 |
| EXTC   |   45 | Sakshi  |   4600 | Gejo Maam  |    2 |
| IT     |   10 | Suhani  |   4300 | Tayyab Sir |    3 |
| IT     |   13 | Erica   |   4400 | Tayyab Sir |    3 |
| IT     |   59 | Shubham |   4700 | Tayyab Sir |    3 |
+--------+------+---------+--------+------------+------+
9 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select * from department natural join employee;
+--------+------------+------+------+---------+--------+
| d_name | hod        | d_id | uid  | Fname   | salary |
+--------+------------+------+------+---------+--------+
| comp   | Sana Maam  |    1 |   16 | Alston  |   4000 |
| comp   | Sana Maam  |    1 |   19 | Bipin   |   3000 |
| comp   | Sana Maam  |    1 | 1234 | Boris   |   2000 |
| EXTC   | Gejo Maam  |    2 |   11 | Gouresh |   4000 |
| EXTC   | Gejo Maam  |    2 |   38 | Shalen  |   4500 |
| EXTC   | Gejo Maam  |    2 |   45 | Sakshi  |   4600 |
| IT     | Tayyab Sir |    3 |   10 | Suhani  |   4300 |
| IT     | Tayyab Sir |    3 |   13 | Erica   |   4400 |
| IT     | Tayyab Sir |    3 |   59 | Shubham |   4700 |
+--------+------------+------+------+---------+--------+
9 rows in set (0.00 sec)
```

```
mysql> alter table employee
    -> add column CR int;
Query OK, 0 rows affected (0.16 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> select * from employee
    -> ;
+------+---------+--------+--------+------+
| uid  | Fname   | salary | d_name | CR   |
+------+---------+--------+--------+------+
|   10 | Suhani  |   4300 | IT     | NULL |
|   11 | Gouresh |   4000 | EXTC   | NULL |
|   13 | Erica   |   4400 | IT     | NULL |
|   16 | Alston  |   4000 | comp   | NULL |
|   19 | Bipin   |   3000 | comp   | NULL |
|   38 | Shalen  |   4500 | EXTC   | NULL |
|   45 | Sakshi  |   4600 | EXTC   | NULL |
|   59 | Shubham |   4700 | IT     | NULL |
| 1234 | Boris   |   2000 | comp   | NULL |
+------+---------+--------+--------+------+
9 rows in set (0.01 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> update employee set CR=10 where d_name="IT";
Query OK, 3 rows affected (0.03 sec)
Rows matched: 3  Changed: 3  Warnings: 0

mysql> select * from employee
    -> ;
+------+---------+--------+--------+------+
| uid  | Fname   | salary | d_name | CR   |
+------+---------+--------+--------+------+
|   10 | Suhani  |   4300 | IT     |   10 |
|   11 | Gouresh |   4000 | EXTC   | NULL |
|   13 | Erica   |   4400 | IT     |   10 |
|   16 | Alston  |   4000 | comp   | NULL |
|   19 | Bipin   |   3000 | comp   | NULL |
|   38 | Shalen  |   4500 | EXTC   | NULL |
|   45 | Sakshi  |   4600 | EXTC   | NULL |
|   59 | Shubham |   4700 | IT     |   10 |
| 1234 | Boris   |   2000 | comp   | NULL |
+------+---------+--------+--------+------+
9 rows in set (0.01 sec)
```

```
mysql> update employee set CR=19 where d_name="comp";
Query OK, 3 rows affected (0.02 sec)
Rows matched: 3  Changed: 3  Warnings: 0

mysql> update employee set CR=11 where d_name="EXTC";
Query OK, 3 rows affected (0.05 sec)
Rows matched: 3  Changed: 3  Warnings: 0
```

```
mysql> select * from employee
    -> ;
+------+---------+--------+--------+------+
| uid  | Fname   | salary | d_name | CR   |
+------+---------+--------+--------+------+
|   10 | Suhani  |   4300 | IT     |   10 |
|   11 | Gouresh |   4000 | EXTC   |   11 |
|   13 | Erica   |   4400 | IT     |   10 |
|   16 | Alston  |   4000 | comp   |   19 |
|   19 | Bipin   |   3000 | comp   |   19 |
|   38 | Shalen  |   4500 | EXTC   |   11 |
|   45 | Sakshi  |   4600 | EXTC   |   11 |
|   59 | Shubham |   4700 | IT     |   10 |
| 1234 | Boris   |   2000 | comp   |   19 |
+------+---------+--------+--------+------+
9 rows in set (0.00 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select e.Fname, e.uid,e.d_name,c.CR from employee e join employee c on (e.uid = c.CR);
+---------+-----+--------+------+
| Fname   | uid | d_name | CR   |
+---------+-----+--------+------+
| Suhani  |  10 | IT     |   10 |
| Gouresh |  11 | EXTC   |   11 |
| Suhani  |  10 | IT     |   10 |
| Bipin   |  19 | comp   |   19 |
| Bipin   |  19 | comp   |   19 |
| Gouresh |  11 | EXTC   |   11 |
| Gouresh |  11 | EXTC   |   11 |
| Suhani  |  10 | IT     |   10 |
| Bipin   |  19 | comp   |   19 |
+---------+-----+--------+------+
9 rows in set (0.00 sec)

mysql> select distinct e.Fname, e.uid,e.d_name,c.CR from employee e join employee c on (e.uid = c.CR);
+---------+-----+--------+------+
| Fname   | uid | d_name | CR   |
+---------+-----+--------+------+
| Suhani  |  10 | IT     |   10 |
| Gouresh |  11 | EXTC   |   11 |
| Bipin   |  19 | comp   |   19 |
+---------+-----+--------+------+
3 rows in set (0.01 sec)
```

```
mysql> select distinct e.Fname, e.uid,e.d_name,c.CR from employee e join employee c where (e.uid = c.CR);
+---------+-----+--------+------+
| Fname   | uid | d_name | CR   |
+---------+-----+--------+------+
| Suhani  |  10 | IT     |   10 |
| Gouresh |  11 | EXTC   |   11 |
| Bipin   |  19 | comp   |   19 |
+---------+-----+--------+------+
3 rows in set (0.00 sec)
```

```
mysql> select distinct e.Fname, e.uid,e.d_name,c.CR from employee e join employee c on (e.uid = c.CR) and c.CR=19;
+-------+-----+--------+------+
| Fname | uid | d_name | CR   |
+-------+-----+--------+------+
| Bipin |  19 | comp   |   19 |
+-------+-----+--------+------+
1 row in set (0.01 sec)
```

Database Management System Lab

Faculty: Sana Shaikh **Student: Bipin Giri**

Roll no.: 19

```
mysql> select e.Fname, e.uid,e.d_name,d.hod from employee e cross join department d;
+---------+------+--------+------------+
| Fname   | uid  | d_name | hod        |
+---------+------+--------+------------+
| Suhani  |   10 | IT     | Tayyab Sir |
| Suhani  |   10 | IT     | Gejo Maam  |
| Suhani  |   10 | IT     | Sana Maam  |
| Gouresh |   11 | EXTC   | Tayyab Sir |
| Gouresh |   11 | EXTC   | Gejo Maam  |
| Gouresh |   11 | EXTC   | Sana Maam  |
| Erica   |   13 | IT     | Tayyab Sir |
| Erica   |   13 | IT     | Gejo Maam  |
| Erica   |   13 | IT     | Sana Maam  |
| Alston  |   16 | comp   | Tayyab Sir |
| Alston  |   16 | comp   | Gejo Maam  |
| Alston  |   16 | comp   | Sana Maam  |
| Bipin   |   19 | comp   | Tayyab Sir |
| Bipin   |   19 | comp   | Gejo Maam  |
| Bipin   |   19 | comp   | Sana Maam  |
| Shalen  |   38 | EXTC   | Tayyab Sir |
| Shalen  |   38 | EXTC   | Gejo Maam  |
| Shalen  |   38 | EXTC   | Sana Maam  |
| Sakshi  |   45 | EXTC   | Tayyab Sir |
| Sakshi  |   45 | EXTC   | Gejo Maam  |
| Sakshi  |   45 | EXTC   | Sana Maam  |
| Shubham |   59 | IT     | Tayyab Sir |
| Shubham |   59 | IT     | Gejo Maam  |
| Shubham |   59 | IT     | Sana Maam  |
| Boris   | 1234 | comp   | Tayyab Sir |
| Boris   | 1234 | comp   | Gejo Maam  |
| Boris   | 1234 | comp   | Sana Maam  |
+---------+------+--------+------------+
27 rows in set (0.01 sec)
```

Conclusion:

In this experiment, students will understand and be able to do the following: Describe the types of problems that subqueries can solve. Sub queries are nested within a SELECT, INSERT, UPDATE, or DELETE statement. A subquery can be used inside the WHERE or HAVING clauses of the outer SELECT, INSERT, UPDATE, or DELETE statements. Build and execute sub query. Define and execute various types of joins.

References: https://www.w3schools.com/sql/sql_join.asp

Experiment No: 8

Topic:	Perform Views and Triggers.
Prerequisite:	Knowledge of Perform Views, Triggers. and SQL syntax.
Mapping With COs:	CSL402.4
Objective:	Creation and dropping of Views and Triggers.
Outcome:	After completion of this lab, the student should be able to: 1. - Explain the purpose of creating Views and Triggers. 2. - Create and drop Views 3. - Create useful Triggers
Instructions:	1. This experiment is a compulsory experiment. All the students are required to perform this experiment individually. 2. Implement Views and Triggers for the assigned system.

Deliverables:	**For Submissions:**
	1. All implemented queries with output.
	
	Listing out our previous databases:
	`mysql> show databases`
	`-> ;`
	`+--------------------+`
	`| Database |`
	`+--------------------+`
	`| hotel |`
	`| information_schema |`
	`| mysql |`
	`| performance_schema |`
	`| sys |`
	`+--------------------+`
	`5 rows in set (0.02 sec)`
	
	Creating new database named student:
	`mysql> create database student;`
	`Query OK, 1 row affected (0.01 sec)`
	
	`mysql> show databases`
	`-> ;`
	`+--------------------+`
	`| Database |`
	`+--------------------+`
	`| hotel |`
	`| information_schema |`
	`| mysql |`
	`| performance_schema |`
	`| student |`
	`| sys |`
	`+--------------------+`
	`6 rows in set (0.00 sec)`

```
mysql> show tables;
Empty set (0.02 sec)
```

Creating two tables:

```
mysql> create table city ( cid int primary key , CityName char(15) ) ;
Query OK, 0 rows affected (0.03 sec)

mysql> create table student_detail(id int primary key , name char(20) , age int(3) , city int , foreign key (city)
 references city(cid));
Query OK, 0 rows affected, 1 warning (0.04 sec)
```

```
mysql> desc city;
+----------+----------+------+-----+---------+-------+
| Field    | Type     | Null | Key | Default | Extra |
+----------+----------+------+-----+---------+-------+
| cid      | int      | NO   | PRI | NULL    |       |
| CityName | char(15) | YES  |     | NULL    |       |
+----------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

```
mysql> desc student_detail;
+-------+----------+------+-----+---------+-------+
| Field | Type     | Null | Key | Default | Extra |
+-------+----------+------+-----+---------+-------+
| id    | int      | NO   | PRI | NULL    |       |
| name  | char(20) | YES  |     | NULL    |       |
| age   | int      | YES  |     | NULL    |       |
| city  | int      | YES  | MUL | NULL    |       |
+-------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Inserting values into tables:

```
mysql> insert into city values ( 1, "Agra"),(2, "Bhopal"),(3,"Delhi"),(4,"Nodia");
Query OK, 4 rows affected (0.02 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

```
mysql> select * from city;
+-----+----------+
| cid | CityName |
+-----+----------+
|   1 | Agra     |
|   2 | Bhopal   |
|   3 | Delhi    |
|   4 | Nodia    |
+-----+----------+
4 rows in set (0.01 sec)
```

```
mysql> insert into student_detail values (1, "Ram kumar",19,1),(2,"Salman khan",18,2),
    -> (3,"Meera khan",19,1),
    -> (4,"Sarita kumar",21,3);
Query OK, 4 rows affected (0.01 sec)
Records: 4  Duplicates: 0  Warnings: 0
```

```
mysql> select * from student_detail;
+----+-------------+------+------+
| id | name        | age  | city |
+----+-------------+------+------+
|  1 | Ram kumar   |   19 |    1 |
|  2 | Salman khan |   18 |    2 |
|  3 | Meera khan  |   19 |    1 |
|  4 | Sarita kumar|   21 |    3 |
+----+-------------+------+------+
4 rows in set (0.00 sec)
```

For getting this details we have to run this query again and again :

```
mysql> select id,name,age,CityName
    -> from student_detail
    -> inner join city
    -> on student_detail.city=city.cid;
+----+-------------+------+----------+
| id | name        | age  | CityName |
+----+-------------+------+----------+
|  1 | Ram kumar   |   19 | Agra     |
|  2 | Salman khan |   18 | Bhopal   |
|  3 | Meera khan  |   19 | Agra     |
|  4 | Sarita kumar|   21 | Delhi    |
+----+-------------+------+----------+
4 rows in set (0.00 sec)
```

Views:

So to prevent this repetition in future we are creating view of this table (query executed).

```
mysql> create view my_student_view
    -> As
    -> select id,name,age,CityName
    -> from student_detail
    -> inner join city
    -> on student_detail.city=city.cid;
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> select * from my_student_view;
+----+--------------+------+----------+
| id | name         | age  | CityName |
+----+--------------+------+----------+
|  1 | Ram kumar    |   19 | Agra     |
|  2 | Salman khan  |   18 | Bhopal   |
|  3 | Meera khan   |   19 | Agra     |
|  4 | Sarita kumar |   21 | Delhi    |
+----+--------------+------+----------+
4 rows in set (0.01 sec)
```

Now we are able to get the same thing using view by just single query

Now deleting the view which we created above:

```
mysql> drop view my_student_view;
Query OK, 0 rows affected (0.01 sec)
```

Getting error if we try to display view after deleting it:

```
mysql> select * from my_student_view;
ERROR 1146 (42S02): Table 'student.my_student_view' doesn't exist
mysql>
```

Triggers:

Creating Trigger for insertion into CityName:

```
mysql>
mysql> create trigger trig_insrt_city
    -> before insert on city
    -> for each row
    -> set new.CityName = upper(new.CityName);
Query OK, 0 rows affected (0.03 sec)
```

Inserting data in city table:

#Let's see whether trigger works or not.

```
mysql>
mysql> insert into city values (5,"Mumbai");
Query OK, 1 row affected (0.00 sec)
```

```
mysql> select * from city;
+-----+----------+
| cid | CityName |
+-----+----------+
|   1 | Agra     |
|   2 | Bhopal   |
|   3 | Delhi    |
|   4 | Nodia    |
|   5 | MUMBAI   |
+-----+----------+
5 rows in set (0.00 sec)
```

Trigger gets activated during insertion and changed CityName to upper case.

```
mysql> drop trigger trig_insrt_city;
Query OK, 0 rows affected (0.01 sec)
```

Dropping trigger if in case we don't need it anymore.

2. Viva based on Views and Triggers.

Conclusion:	Thus creation and dropping of View and Triggers are executed successfully.
References:	Put the reference of resources used to perform this experiment. (Referred textbooks/websites etc.)