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Group B: SQL & PL/SQLAssignment No: 4

Aim:

Design any database with at least 3 entities and relationships between them. Apply DCL and DDL commands. Draw suitable ER/EER diagram for the system.

Objective:

- To understand the different issues involved in the design and implementation of a databasesystem
- To understand and use Data Definition Language and Data Control Language to write query for adatabase

Theory:

DATADEFINITIONLANGUAGE(DDL): TheDataDefinitionLanguage(DDL)isusedto create and destroy databases and database objects. These commands will primarily be used by database administrators during the setup and removal phases of a database project. **Some commands of DDLare:**

- CREATE – to create table (objects) in thedatabase
- ALTER – alters the structure of thedatabase
- DROP – delete table from thedatabase
- TRUNCATE – remove all records from a table, including all spaces allocated forthe records are removed
- RENAME – rename atable

1. CREATE:

(a) CREATE DATABASE: You can create a MySQL database by using MySQLCommand
Syntax:

CREATE DATABASE database_name;
Example:

Let's take an example to create a database name "employees"

CREATE DATABASE employees;
We can check the created database by the following query:

SHOW DATABASES;

(b) USE DATABASE: Used to select a particulardatabase.

Syntax:

USE database_name;

Example: Let's take an example to use a database name "customers".

USE customers;

(c) DROP DATABASE: You can drop/delete/remove a MySQL database easily with the MySQL command. You should be careful while deleting any database because you will lose your all the data available in yourdatabase.

Syntax:

DROP DATABASE database_name;

Example: Let's take an example to drop a database name "employees"

DROP DATABASE employees;

(d) CREATE TABLE: This is used to create a new relation(table)

The MySQL CREATE TABLE command is used to create a new table into the database.

Syntax:

Following is a generic syntax for creating a MySQL table in the database.

CREATE TABLE table_name (column_namecolumn_type...);

Example:

Here, we will create a table named "student" in the database "mydatabase".

```
CREATE TABLE cus_tbl(
  roll_no INT NOT NULL ,
  fnameVARCHAR(100) NOT NULL,
  surname VARCHAR(100) NOT NULL,
```

PRIMARY KEY (roll_no)

See the created table: Use the following command to see the table already created:

SHOW tables;

See the table structure: Use the following command to see the table already created:

DESCRIBE table_name;

2. ALTER:

MySQL ALTER statement is used when you want to change the name of your table or any table field. It is also used to add or delete an existing column in a table.

The ALTER statement is always used with "ADD", "DROP" and "MODIFY" commands according to the situation.

(a) ALTER TABLE ...ADD...: This is used to add some extra fields intoexisting relation.

Syntax: ALTER TABLE relation_name ADD (new field_1 data_type(size), new field_2 data_type(size),..);

Example: ALTER TABLE student ADD (Address CHAR(10));

(b) ALTER TABLE...MODIFY...: This is used to change the width as well as data type of fields of existingrelations.

Syntax: ALTER TABLE relation_name MODIFY (field_1 newdata_type(Size), field_2 newdata_type(Size),... field_newdata_type(Size));

Example: ALTER TABLE student MODIFY(fname VARCHAR(10),class VARCHAR(5));

c) ALTERTABLE..DROP..... This is used to remove any field of existingrelations.

Syntax: ALTER TABLE relation_name DROP COLUMN (field_name);

Example: ALTER TABLE student DROP column (sname);

d)ALTERTABLE..RENAME..... This is used to change the name of fieldsin existing relations.

Syntax: ALTER TABLE relation_name RENAME COLUMN (OLD field_name) to (NEW field_name);

Example: ALTER TABLE student RENAME COLUMN sname to stu_name;

3. RENAME: It is used to modify the name of the existing databaseobject.

Syntax: RENAME TABLE old_relation_name TO new_relation_name;

Example: RENAME TABLE studentd TO studentd1;

4. <u>TRUNCATE andDROP</u>

<u>Difference between Truncate &Drop:-</u>

RUNCATE: This command will remove the data permanently. But structure will not be removed.
DROP: This command will delete the table data and structure permanently.

Syntax: TRUNCATE TABLE <Table

name>***Example*** TRUNCATE TABLE student;

Syntax: DROP TABLE <Table

name>***Example*** DROP TABLE student;

Data Control Language(DCL) : Thisis used to control privilege in Database. To perform any operation in the database, such as for creating tables, sequences or views we need privileges.

DCL defines two commands,

- **Grant :**Gives user access privileges to database.
- **Revoke :**Take back permissions fromuser.

Syntax: GRANT privilege_nameON object_name TO {user_name };

Example:GRANT CREATE TABLE TO user1;

REVOKE privilege_name ON object_name FROM {user_name };

Example:REVOKE CREATE TABLE FROM user1;

LAB PRACTICE ASSIGNMENT:

Consider the following table structures for this assignment:

Table Name 1: **CUSTOMER**

Fields:

Cust_idvarchar(10) Primary Key,C_nameVarchar(15) Not NULL,City varchar(10).

Table Name 2: **BRANCH**

Fields:

Branch_idVarchar(5) Primary Key, bnameVarchar (15), City varchar(10).

Table Name 3: **DEPOSIT**

Fields:

Acc_novarchar(10) Primary Key,Cust_idVarchar(10) Not NULL, Amount int,Branch_idVarchar(5), Open_date date.

Table Name 4: **BORROW**

Fields:

Loan_noVarchar(5) Primary Key, Cust_idVarchar (10), Branch_idvarchar(5), Amountint.

Perform the following command/operation on the above table:

1) Create aDatabase
2) ShowDatabase
3) UseDatabase
4) DropDatabase
5) Create tables and Describe that Tables
6) AlterCommand
   i) Add column address to Customer table
   ii) Modify anycolumn
   iii) Rename column address tonew_address
   iv) Drop column address from Customer table
   v) Rename table Branch toBranch1
6) Perform DCL Commands Grant and Revoke on Customertable
7) Truncatetable
8) Droptable

Note:

1) For truncate and drop command create any othertable
2) In write-up, write the description and uses of all commands with syntax in thegiven format
3) Printout should also consists of command execution in the given orderonly.

Conclusion:-

We have studied and created a database with at least 3 entities and relationships between them and applied DCL and DDL commands.

Code &Output: -

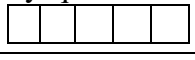
```
Atharva@BRAINMETRON:~$

sudomysql -u root #mysql>

showdatabases;
+.....+
|Database           |
+.....+
| information_schema |
|mysql              |
| performance_schema |
|sys                |
|Atharva            |
+.....+
5 rows in set (0.08 sec)

mysql> use Atharva
Database changed

mysql> show tables;
+.....+
| Tables_in_Atharva |
+.....+
|student           |
+.....+
1 row in set (0.00sec)

mysql> create table employee(EID int, Ename varchar(10),Salary int,Designation varchar(10));
Query OK, 0 rows affected (0.54 sec)

mysql> show tables;
+.....+
| Tables_in_Atharva |
+.....+
|employee          |
|student           |
+.....+
2 rows in set (0.00sec)

mysql> insert into employee values(1001,'Atharva',50000,Developer);

Query OK, 1 row affected (0.09 sec)

mysql> select * from employee;
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
```

1001	Atharva	50000	Developer

1 row in set (0.00 sec)

```
mysql> insert into employee values(1002,'Devansh',50000,'Developer');
Query OK, 1 row affected (0.06sec)

mysql> insert into employee values(1002,'Monika',70000,'HR');
Query OK, 1 row affected (0.06sec)

mysql> insert into employee values(1002,'Sushil',70000,'CEO');
Query OK, 1 row affected (0.06sec)

mysql> insert into employeevalues(1002,'Jaya',50000,'Manager');
Query OK, 1 row affected (0.06sec)

mysql> select * from employee;
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1002 | Monika  |  70000|HR           |
| 1002 | Sushil  |  70000|CEO          |
| 1002|Jaya      |  50000|Manager      |
+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> select * from student;
+.....+.....+.....+
| roll|sname      | contact|
+.....+.....+.....+
| 32 | Atharva | 9689672625 |
| 31 | abuzar | 976378092 |
|   30|summa      | 976378091|
|   33 | karishma | 976378090|
| 34 | vaibhav | 976378095 |
+.....+.....+.....+
5 rows in set (0.00sec)

mysql> describe employee;
+.....+.....+.....+.....+.....+.....+
|Field       |Type         | Null | Key | Default | Extra|
+.....+.....+.....+.....+.....+.....+
|EID          |int(11)      |YES  |     |NULL     |      |
|Ename        | varchar(10) |YES |      |NULL     |      |
|Salary       |int(11)      |YES  |     |NULL     |      |
| Designation | varchar(10) |YES  |     |NULL     |      |
+.....+.....+.....+.....+.....+.....+
4 rows in set (0.00sec)

mysql> select EID,Ename from employee;
```

```
+.....+.....+
| EID  |Ename|
+.....+.....+
| 1001 | Atharva |
| 1002 | Devansh|
| 1002 | Monika|
| 1002 | Sushil|
| 1002|Jaya      |
+.....+.....+
5 rows in set (0.01 sec)

mysql> alter table employee add Address varchar(20);
Query OK, 0 rows affected (0.83 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select * from employee;
+.....+.....+.....+.....+.....+
| EID | Ename | Salary | Designation | Address |
+.....+.....+.....+.....+.....+
| 1001 | Atharva|  50000 | Developer |NULL          |
| 1002 | Devansh|  50000 | Developer |NULL        |
| 1002 | Monika  |  70000|HR           |NULL     |
| 1002 | Sushil  |  70000|CEO          |NULL     |
| 1002|Jaya      |  50000|Manager      |NULL     |
+.....+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> alter table employee modify Address varchar(20) ;
Query OK, 0 rows affected (0.06 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> describe employee;
+.....+.....+.....+.....+.....+.....+
|Field       |Type         | Null | Key | Default | Extra|
+.....+.....+.....+.....+.....+.....+
|EID         |int(11)      |YES  |      |NULL     |      |
|Ename        | varchar(10) |YES |      |NULL     |      |
|Salary       |int(11)      |YES  |     |NULL     |      |
| Designation | varchar(10) |YES  |     |NULL     |      |
|Address      | varchar(20) |YES |      |NULL     |      |
+.....+.....+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> alter table employee change Address Residence varchar(10);
Query OK, 5 rows affected (1.13 sec)
Records: 5 Duplicates: 0 Warnings: 0

mysql> select * from employee;
```



```
| EID | Ename | Salary | Designation | Residence |
+.....+.....+.....+.....+.....+
| 1001 | Atharva|  50000 | Developer |NULL           |

| 1002 | Devansh|  50000 | Developer |NULL          |
| 1002 | Monika  |  70000|HR           |NULL       |
| 1002 | Sushil  |  70000|CEO          |NULL       |
| 1002|Jaya      |  50000|Manager      |NULL       |
+.....+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> alter table employee drop Residence;
Query OK, 0 rows affected (0.84 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> select * from employee;
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1002 | Monika  |  70000|HR           |
| 1002 | Sushil  |  70000|CEO          |
| 1002|Jaya      |  50000|Manager      |
+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> select * from student
    -> ;
+.....+.....+.....+
| roll|sname      | contact|
+.....+.....+.....+
| 32 | Atharva | 9689672625 |
| 31 | abuzar | 976378092 |
|   30|summa      | 976378091|
|   33 | karishma | 976378090|
| 34 | vaibhav | 976378095 |
+.....+.....+.....+
5 rows in set (0.00sec)

mysql> truncate student;
Query OK, 0 rows affected (0.28 sec)

mysql> select * from student
    -> ;
Empty set (0.00 sec)

mysql> show tables;
```

```
| Tables_in_Atharva |
+-------------------+
|employee           |
|student            |
+-------------------+
2 rows in set (0.00 sec)

mysql> drop table student;
Query OK, 0 rows affected (0.26 sec)

mysql> show tables;
+-------------------+
| Tables_in_Atharva |
+-------------------+
|employee           |
+-------------------+
1 row in set (0.00 sec)

mysql> create user 'Atharva' identified by '1100';
Query OK, 0 rows affected (0.00 sec)

mysql> exit
Bye

Atharva@BRAINMETRON:~$ sudomysql -u
Atharva -p Enter password:

mysql> show databases;
+--------------------+
|Database            |
+--------------------+
| information_schema |
+--------------------+
1 row in set (0.00 sec)

mysql> create database Atharva;
ERROR 1044 (42000): Access denied for user 'Atharva'@'%' to database 'Atharva'
mysql> show tables;
ERROR 1046 (3D000): No database selected
mysql> use Atharva
ERROR 1044 (42000): Access denied for user 'Atharva'@'%' to database 'Atharva'
mysql> exit
Bye

Atharva@BRAINMETRON:~$

sudomysql -u root # mysql> use Atharva;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
```

```
Database changed
mysql> grant all on employee to Atharva;
Query OK, 0 rows affected (0.00 sec)

mysql> exit
Bye


Atharva@BRAINMETRON:~$ sudomysql -u
Atharva -p Enter password:

mysql> use Atharva;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+----------------------+
| Tables_in_Atharva |
+----------------------+
|employee           |
+----------------------+
1 row in set (0.00 sec)

mysql> select * from emloyee;
ERROR 1142 (42000): SELECT command denied to user 'Atharva'@'localhost' for table 'emloyee'
mysql> exit
Bye

Atharva@BRAINMETRON:~$ sudomysql -u root #
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 5.7.26-0ubuntu0.18.04.1 (Ubuntu)

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use Atharva;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed

mysql> REVOKE all ON employee FROM Atharva;
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> exit
Bye

Atharva@BRAINMETRON:~$ sudomysql -u
Atharva -p Enter password:

mysql> use Atharva;
ERROR 1044 (42000): Access denied for user 'Atharva'@'%' to database 'Atharva'

mysql> show databases;
+--------------------+
|Database            |
+--------------------+
| information_schema |
+--------------------+
1 row in set (0.01 sec)

mysql> exit
Bye
Atharva@BRAINMETRON:~$ sudomysql -u root #
Welcome to the MySQL monitor. Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 5.7.26-0ubuntu0.18.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use Atharva;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables
    -> ;
+----------------+
| Tables_in_Atharva |
+----------------+
|employee        |
+----------------+
1 row in set (0.00 sec)

mysql> UPDATE employee SET EID=1003 where Ename='Monika';
Query OK, 1 row affected (0.09 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> select * from employee;
+-----+---------+--------+-------------+
| EID | Ename | Salary | Designation |
+-----+---------+--------+-------------+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1003 | Monika  |  70000|HR           |
| 1002 | Sushil  |  70000|CEO          |
| 1002|Jaya      |  50000|Manager      |
|      |         |       |             |

5 rows in set (0.00 sec)

mysql> UPDATE employee SET EID=1004 where Ename='Sushil';
Query OK, 1 row affected (0.09 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from employee;
+-----+---------+--------+-------------+
| EID | Ename | Salary | Designation |
+-----+---------+--------+-------------+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1003 | Monika  |  70000|HR           |
| 1004 | Sushil  |  70000|CEO          |
| 1002|Jaya      |  50000|Manager      |
+-----+---------+--------+-------------+
5 rows in set (0.00sec)

mysql> UPDATE employee SET EID=1004 where Ename='Jaya';
Query OK, 1 row affected (0.06 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from employee;
+-----+---------+--------+-------------+
| EID | Ename | Salary | Designation |
+-----+---------+--------+-------------+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1003 | Monika  |  70000|HR           |
| 1004 | Sushil  |  70000|CEO          |
| 1004|Jaya      |  50000|Manager      |
+-----+---------+--------+-------------+
5 rows in set (0.00sec)

mysql> UPDATE employee SET EID=1005 where Ename='Jaya';
Query OK, 1 row affected (0.06 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from employee;
```

```
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
| 1001 | Atharva | 50000 | Developer|
| 1002 | Devansh | 50000 | Developer|
| 1003 | Monika  |  70000|HR           |
| 1004 | Sushil  |  70000|CEO          |
| 1005|Jaya      |  50000|Manager      |
+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> UPDATE employee SET salary=salary-10000;

Query OK, 5 rows affected (0.05 sec)
Rows matched: 5 Changed: 5 Warnings: 0

mysql> select * from employee;
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
| 1001 | Atharva | 40000 | Developer|
| 1002 | Devansh | 40000 | Developer|
| 1003 | Monika  |  60000|HR           |
| 1004 | Sushil  |  60000|CEO          |
| 1005|Jaya      |  40000|Manager      |
+.....+.....+.....+.....+
5 rows in set (0.00sec)

mysql> delete from employee where EID=1004;
Query OK, 1 row affected (0.06 sec)

mysql> select * from employee;
+.....+.....+.....+.....+
| EID | Ename | Salary | Designation |
+.....+.....+.....+.....+
| 1001 | Atharva | 40000 | Developer|
| 1002 | Devansh | 40000 | Developer|
| 1003 | Monika  |  60000|HR           |
| 1005|Jaya      |  40000|Manager      |
+.....+.....+.....+.....+
4 rows in set (0.00sec)

mysql> exit
Bye
```