

## Lab-1: Basics of DDL and DML Statements

Prepare Lab Sheet of MYSQL Statements for following.

1. Create a database named "Yourname\_Roll\_COMPANY" e.g.: Atiz\_02\_Company and then create following tables within the database. Specify proper primary keys and the needed constraints while defining the tables. Use appropriate data types for the attributes.

CREATE DATABASE Kaushal\_13\_Company;

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.01 sec)

mysql> create database Kaushal_13_Company;
Query OK, 1 row affected (0.01 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| kaushal_13_company |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)
```

- a. Employee (SSN, Ename, Gender, Bdate, Address, Salary, Ono, Years\_of\_experience); where Ono is a foreign key referencing to the Office table. Set default value of salary to 0.00. The Ename should not be null. Set SSN to auto increment. The Ename and address should be varchar, Gender should be char(1), Bdate should be date type, Salary should be decimal type with two digits after decimal. Years\_of\_experience should be integer. Use Check constraint for gender as CHECK (Gender IN ('M', 'F'))

```
mysql> create table Employee(
  -> SSN int auto_increment primary key not null,
  -> Ename varchar(255) not null,
  -> Gender char(1) check (Gender in ('M','F')),
  -> Bdate date,
  -> Address varchar(255),
  -> Salary decimal(10,2) default 0.00,
  -> Ono int,
  -> Years_of_experience int,
  -> foreign key (Ono) references Office(Onumber)
  -> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc Employee;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| SSN | int | NO | PRI | NULL | auto_increment |
| Ename | varchar(255) | NO | | NULL | |
| Gender | char(1) | YES | | NULL | |
| Bdate | date | YES | | NULL | |
| Address | varchar(255) | YES | | NULL | |
| Salary | decimal(10,2) | YES | | 0.00 | |
| Ono | int | YES | MUL | NULL | |
| Years_of_experience | int | YES | | NULL | |
+-----+-----+-----+-----+-----+-----+
8 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

- b. Office (Onumber, Oname, Country); where Oname should not be NULL. Country should be varchar.

```
mysql> use Kaushal_13_Company;
Database changed
mysql> create table Office(
  -> Onumber int primary key,
  -> Oname varchar(255) not null,
  -> Country varchar(255)
  -> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc Office;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Onumber | int           | NO   | PRI | NULL    |       |
| Oname   | varchar(255)  | NO   |     | NULL    |       |
| Country | varchar(255)  | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.01 sec)
```

- c. Project (Pnumber, Pname, Plocation, Onumber); where Onumber is a foreign key referencing Office table. Create a constraint name fk\_pro for the foreign key. Pname should be unique and should not be null. Both Pname and Plocations should be of type varchar(40).

```
mysql> create table Project(
  -> Pnumber int primary key,
  -> Pname varchar(40) unique not null,
  -> Plocation varchar(40),
  -> Onumber int,
  -> constraint fk_pro foreign key(Onumber) references Office(Onumber)
  -> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc Project;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Pnumber | int           | NO   | PRI | NULL    |       |
| Pname   | varchar(40)   | NO   | UNI | NULL    |       |
| Plocation | varchar(40)   | YES  |     | NULL    |       |
| Onumber | int           | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

- d. Works\_on( ESSN, Pno); where ESSN references Employee SSN and Pno references to Pnumber from Project . Set cascade on update and cascade on delete to both

Ans:-

**DELETE CASCADE:** When we create a foreign key using this option, it deletes the referencing rows in the child table when the referenced row is deleted in the parent table which has a primary key.

**UPDATE CASCADE:** When we create a foreign key using UPDATE CASCADE the referencing rows are updated in the child table when the referenced row is updated in the parent table which has a primary key.

```
mysql> create table Works_on(
->   ESSN int,
->   Pno int,
->   foreign key (ESSN) references Employee(SSN)
->   on update cascade
->   on delete cascade,
->   foreign key (Pno) references Project(Pnumber)
->   on update cascade
->   on delete cascade
-> );
Query OK, 0 rows affected (0.06 sec)

mysql> desc Works_on;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ESSN  | int  | YES  | MUL | NULL    |       |
| Pno   | int  | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)
```

- e. Dependents(Did, Dname, Dage, SSN); where SSN is Foreign key referencing the employee. Set NULL on delete and on update to the foreign key. Add constraint age\_constraint using CHECK(Dage<16).

Constraints are rules or conditions that are applied to the data within a database for data integrity and consistency.

Check Constraints is used to check the age to be less than 16 while inserting the data.

```
mysql> create table Dependents(
->   Did int primary key,
->   Dname varchar(255),
->   Dage int,
->   SSN int,
->   Drelation char(50),
->   foreign key (SSN) references Employee(SSN)
->   on delete set null
->   on update set null,
->   constraint age_constraint check (Dage<16)
-> );
Query OK, 0 rows affected (0.07 sec)

mysql> desc Dependents;
+-----+-----+-----+-----+-----+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Did   | int  | NO   | PRI | NULL    |       |
| Dname | varchar(255) | YES |     | NULL    |       |
| Dage  | int  | YES  |     | NULL    |       |
| SSN   | int  | YES  | MUL | NULL    |       |
| Drelation | char(50) | YES |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

2. Alter table Dependents and modify the attribute Drelation of type Char(50) to Varchar(50)

Altered the table to modify the data type of Drelation column

```
mysql> alter table Dependents
-> modify Drelation varchar(50);
Query OK, 0 rows affected (0.13 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> desc Dependents;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Did   | int           | NO   | PRI | NULL    |       |
| Dname | varchar(255)  | YES  |     | NULL    |       |
| Dage  | int           | YES  |     | NULL    |       |
| SSN   | int           | YES  | MUL | NULL    |       |
| Drelation | varchar(50) | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

3. Insert at least five tuples into the tables. (Illustrate insertion of single tuple and multiple tuples both). During insertion insert following as well.

There should be one record in the Employee table having Ename "Your name" i. e. Deric and SSN "Your roll number" e.g. 6.

Similarly one of the tuple in employee should have salary 30000.

```
mysql> insert into Employee (SSN, Ename, Gender, Bdate, Address, Salary, Ono, Years_of_experience)
-> values (1,"Santosh Parajuli","M","1996-05-01","Kirtipur",55000,1,7),
-> (2,"Raju Shrestha","M","1995-01-01","Kalimati",50000,2,5),
-> (3,"Bipin Maharjan","M","1994-08-12","Kirtipur",40000,5,2),
-> (4,"Rishi Pradhananga","M","1990-10-21","Anamnagar",60000,4,8),
-> (5,"Dipen Khatri","M","1993-02-07","Pepsicola",58000,3,10),
-> (13,"Kaushal Khatiwada","M","1996-10-28","Kaushaltar",30000,6,6);
Query OK, 6 rows affected (0.02 sec)
Records: 6 Duplicates: 0 Warnings: 0

mysql> select * from Employee;
+-----+-----+-----+-----+-----+-----+-----+-----+
| SSN | Ename          | Gender | Bdate      | Address    | Salary | Ono | Years_of_experience |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 1   | Santosh Parajuli | M      | 1996-05-01 | Kirtipur   | 55000.00 | 1   | 7                   |
| 2   | Raju Shrestha    | M      | 1995-01-01 | Kalimati   | 50000.00 | 2   | 5                   |
| 3   | Bipin Maharjan   | M      | 1994-08-12 | Kirtipur   | 40000.00 | 5   | 2                   |
| 4   | Rishi Pradhananga | M      | 1990-10-21 | Anamnagar  | 60000.00 | 4   | 8                   |
| 5   | Dipen Khatri     | M      | 1993-02-07 | Pepsicola  | 58000.00 | 3   | 10                  |
| 13  | Kaushal Khatiwada | M      | 1996-10-28 | Kaushaltar | 30000.00 | 6   | 6                   |
+-----+-----+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

There should be one record in the Project table having Pname = "Your name\_ProjMDS" and Pnumber = 2\*Your Roll number.

```
mysql> insert into Project (Pnumber, Pname, Plocation, Onumber)
-> values (1,"SaaS Product Deployment","Satdobato",1),
->         (2,"HCI Deployment","Kupondole",2),
->         (3,"Sever Protection","Bangalore",3),
->         (4,"Dell R740 Resouce Upgradation","New York",4),
->         (5,"Payment Feature Addition","Sanepa",5),
->         (13,"Kaushal_ProjMDS","Kaushaltar",6);
Query OK, 6 rows affected (0.01 sec)
Records: 6 Duplicates: 0 Warnings: 0

mysql> select * from Project;
+-----+-----+-----+-----+
| Pnumber | Pname                | Plocation | Onumber |
+-----+-----+-----+-----+
| 1       | SaaS Product Deployment | Satdobato | 1       |
| 2       | HCI Deployment         | Kupondole | 2       |
| 3       | Sever Protection       | Bangalore | 3       |
| 4       | Dell R740 Resouce Upgradation | New York | 4       |
| 5       | Payment Feature Addition | Sanepa    | 5       |
| 13      | Kaushal_ProjMDS        | Kaushaltar | 6       |
+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

One of the tuple in Office table should have office name "Yourname\_Office\_Roll" i.e. Deric\_Office\_06.

In addition, there should be one tuple in office table having office name Yourname\_Ncell\_Roll.

```
mysql> insert into Office(Onumber,Oname,Country)
-> values (1,"C8I","Nepal"),
->         (2,"Cypher Technology","Nepal"),
->         (3,"Visec Technology","India"),
->         (4,"Dell Technology","USA"),
->         (5,"Info Developer","Nepal"),
->         (6,"Kaushal_Office_13","Nepal");
Query OK, 6 rows affected (0.02 sec)
Records: 6 Duplicates: 0 Warnings: 0

mysql> insert into Office(Onumber,Oname,Country)
-> values (13,"Kaushal_Ncell_13","Nepal");
Query OK, 1 row affected (0.01 sec)

mysql> select * from Office;
+-----+-----+-----+
| Onumber | Oname                | Country |
+-----+-----+-----+
| 1       | C8I                  | Nepal   |
| 2       | Cypher Technology    | Nepal   |
| 3       | Visec Technology     | India   |
| 4       | Dell Technology      | USA     |
| 5       | Info Developer       | Nepal   |
| 6       | Kaushal_Office_13    | Nepal   |
| 13      | Kaushal_Ncell_13     | Nepal   |
+-----+-----+-----+
7 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

"Works\_on" Table

```
mysql> insert into Works_on(ESSN,Pno)
-> values (1,1),
->         (2,2),
->         (3,5),
->         (4,4),
->         (5,3),
->         (13,13);
Query OK, 6 rows affected (0.01 sec)
Records: 6 Duplicates: 0 Warnings: 0

mysql> select * from Works_on;
+-----+-----+
| ESSN | Pno |
+-----+-----+
| 1    | 1   |
| 2    | 2   |
| 3    | 5   |
| 4    | 4   |
| 5    | 3   |
| 13   | 13  |
+-----+-----+
6 rows in set (0.00 sec)
```

In the dependents table insert the rows with Dname and Drelation having values from your family. For example, Deric has his elder brother and mother as his dependents. So the table will have records with values Dname=Denish and Drelation=Brother and Dname=Gayatri and Drelation=Mother. Take assumptions based on your family members while inserting the values.

```
mysql> insert into Dependents (Did,Dname,Dage,SSN,Drelation)
-> values (1,"Ram Khatiwada",15,13,"Brother"),
->        (2,"Sharmila Parajuli",11,1,"Sister"),
->        (3,"Ryan Shrestha",9,2,"Brother"),
->        (4,"Gopal Khatri",3,5,"Son");
Query OK, 4 rows affected (0.01 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> select * from Dependents;
+-----+-----+-----+-----+-----+
| Did | Dname          | Dage | SSN | Drelation |
+-----+-----+-----+-----+-----+
| 1   | Ram Khatiwada  | 15   | 13  | Brother   |
| 2   | Sharmila Parajuli | 11   | 1   | Sister    |
| 3   | Ryan Shrestha  | 9    | 2   | Brother   |
| 4   | Gopal Khatri   | 3    | 5   | Son       |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

But insert query violates the check constraints i.e. <16 then it restricts the query execution.  
For mother record age

```
mysql> insert into dependents (Did,Dname,Dage,SSN,Drelation)
-> values (5,"Maya Khatiwada",50,13,"Mother");
ERROR 3819 (HY000): Check constraint 'age_constraint' is violated.
mysql>
```

4. Update the name of office having office name "Yourname\_Ncell\_Roll" to "Yourname\_Ntc\_Roll".

```
mysql> select * from Office;
+-----+-----+-----+
| Onumber | Oname                | Country |
+-----+-----+-----+
| 1       | C8I                  | Nepal   |
| 2       | Cypher Technology    | Nepal   |
| 3       | Visec Technology     | India   |
| 4       | Dell Technology      | USA     |
| 5       | Info Developer       | Nepal   |
| 6       | Kaushal_Office_13    | Nepal   |
| 13      | Kaushal_Ncell_13     | Nepal   |
+-----+-----+-----+
7 rows in set (0.00 sec)
```

```
mysql> update Office
-> set Oname="Kaushal_Ntc_13"
-> where Oname="Kaushal_Ncell_13";
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
mysql> select * from Office;
+-----+-----+-----+
| Onumber | Oname                | Country |
+-----+-----+-----+
| 1       | C8I                  | Nepal   |
| 2       | Cypher Technology    | Nepal   |
| 3       | Visec Technology     | India   |
| 4       | Dell Technology      | USA     |
| 5       | Info Developer       | Nepal   |
| 6       | Kaushal_Office_13    | Nepal   |
| 13      | Kaushal_Ntc_13       | Nepal   |
+-----+-----+-----+
7 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

5. Delete those employees whose SSN is 1. {{{Got null on Dependent SSN}}}

```
mysql> delete from Employee
-> where SSN=1;
Query OK, 1 row affected (0.01 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+-----+-----+-----+
| SSN | Ename          | Gender | Bdate   | Address   | Salary | Ono | Years_of_experience |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 2   | Raju Shrestha  | M      | 1995-01-01 | Kalimati | 50000.00 | 2   | 5                   |
| 3   | Bipin Maharjan | M      | 1994-08-12 | Kirtipur | 40000.00 | 5   | 2                   |
| 4   | Rishi Pradhananga | M      | 1990-10-21 | Anamnagar | 60000.00 | 4   | 8                   |
| 5   | Dipen Khatri   | M      | 1993-02-07 | Pepsicola | 58000.00 | 3   | 10                  |
| 13  | Kaushal Khatiwada | M      | 1996-10-28 | Kaushaltar | 30000.00 | 6   | 6                   |
+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

Here, after deleting the primary key record, foreign key on “Dependents” table referencing the “Employee” SSN is set to NULL.

```
mysql> select * from Dependents;
+-----+-----+-----+-----+-----+
| Did | Dname          | Dage | SSN | Drelation |
+-----+-----+-----+-----+-----+
| 1   | Ram Khatiwada  | 15   | 13  | Brother   |
| 2   | Sharmila Parajuli | 11   | NULL | Sister    |
| 3   | Ryan Shrestha  | 9     | 2   | Brother   |
| 4   | Gopal Khatri   | 3     | 5   | Son       |
+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

Here, after deleting the primary key record, foreign key on “Works\_on” table referencing the Employee SSN is also Deleted to maintain integrity.

```
mysql> select * from Works_on;
+-----+-----+
| ESSN | Pno |
+-----+-----+
| 2    | 2   |
| 3    | 5   |
| 4    | 4   |
| 5    | 3   |
| 13   | 13  |
+-----+-----+
5 rows in set (0.00 sec)
```



## Lab-1: Basics of DDL and DML Statements

6. Alter table Project to rename the attribute in Plcoation to Proj\_location

```
mysql> desc Project;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Pnumber    | int       | NO   | PRI | NULL    |       |
| Pname      | varchar(40) | NO   | UNI | NULL    |       |
| Plocation  | varchar(40) | YES  |     | NULL    |       |
| Onumber    | int       | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> alter table Project
-> rename column Plocation to Proj_location;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> desc Project;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| Pnumber    | int       | NO   | PRI | NULL    |       |
| Pname      | varchar(40) | NO   | UNI | NULL    |       |
| Proj_location | varchar(40) | YES  |     | NULL    |       |
| Onumber    | int       | YES  | MUL | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)
```

7. Select tuples from all of the tables individually.

```
mysql> select * from Office;
+-----+-----+-----+
| Onumber | Oname      | Country |
+-----+-----+-----+
| 1       | C8I        | Nepal   |
| 2       | Cypher Technology | Nepal   |
| 3       | Visec Technology | India   |
| 4       | Dell Technology | USA     |
| 5       | Info Developer | Nepal   |
| 6       | Kaushal_Office_13 | Nepal   |
| 13      | Kaushal_Ntc_13 | Nepal   |
+-----+-----+-----+
7 rows in set (0.00 sec)

mysql> select * from Employee;
+-----+-----+-----+-----+-----+-----+-----+
| SSN | Ename      | Gender | Bdate      | Address      | Salary | Ono | Years_of_experience |
+-----+-----+-----+-----+-----+-----+-----+
| 2    | Raju Shrestha | M      | 1995-01-01 | Kalimati     | 50000.00 | 2   | 5 |
| 3    | Bipin Maharjan | M      | 1994-08-12 | Kirtipur     | 40000.00 | 5   | 2 |
| 4    | Rishi Pradhananga | M      | 1990-10-21 | Anamnagar    | 60000.00 | 4   | 8 |
| 5    | Dipen Khatri | M      | 1993-02-07 | Pepsicola    | 58000.00 | 3   | 10 |
| 13   | Kaushal Khatriwada | M      | 1996-10-28 | Kaushaltar   | 30000.00 | 6   | 6 |
+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

```
mysql> select * from Project;
```

Pnumber	Pname	Proj_location	Onumber
1	SaaS Product Deployment	Satdobato	1
2	HCI Deployment	Kupondole	2
3	Sever Protection	Bangalore	3
4	Dell R740 Resouce Upgradation	New York	4
5	Payment Feature Addition	Sanepa	5
13	Kaushal_ProjMDS	Kaushaltar	6

```
6 rows in set (0.00 sec)
```

  

```
mysql> select * from works_on;
```

ESSN	Pno
2	2
3	5
4	4
5	3
13	13

```
5 rows in set (0.00 sec)
```

  

```
mysql> select * from dependents;
```

Did	Dname	Dage	SSN	Drelation
1	Ram Khatiwada	15	13	Brother
2	Sharmila Parajuli	11	NULL	Sister
3	Ryan Shrestha	9	2	Brother
4	Gopal Khatri	3	5	Son

8. Drop the table Works\_on. Make sure to export your database before you drop it so that you can recover.

```
mysql> show tables;
```

Tables_in_kaushal_13_company
dependents
employee
office
project
works_on

```
5 rows in set (0.00 sec)
```

  

```
mysql> drop table Works_on;
```

Query OK, 0 rows affected (0.05 sec)

  

```
mysql> show tables;
```

Tables_in_kaushal_13_company
dependents
employee
office
project

```
4 rows in set (0.00 sec)
```

## Lab-1: Basics of DDL and DML Statements

- Drop the constraint age\_constraint from dependent table

After dropping the Age check constraint we will be able to insert age value greater than 16

```
mysql> alter table Dependents
-> drop constraint age_constraint;
Query OK, 0 rows affected (0.03 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> insert into dependents (Did,Dname,Dage,SSN,Drelation)
-> values (5,"Maya Khatiwada",50,13,"Mother");
Query OK, 1 row affected (0.01 sec)

mysql> select * from Dependents;
+-----+-----+-----+-----+-----+
| Did | Dname          | Dage | SSN  | Drelation |
+-----+-----+-----+-----+-----+
| 1   | Ram Khatiwada  | 15   | 13   | Brother    |
| 2   | Sharmila Parajuli | 11   | NULL | Sister     |
| 3   | Ryan Shrestha  | 9    | 2    | Brother    |
| 4   | Gopal Khatri   | 3    | 5    | Son        |
| 5   | Maya Khatiwada | 50   | 13   | Mother     |
+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

- Drop the database COMPANYY. Make sure to export your database before you drop it so that you can recover.

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| kaushal_13_company |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)

mysql> drop database Kaushal_13_Company;
Query OK, 4 rows affected (0.07 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)
```

## **Lab-1: Basics of DDL and DML Statements**