EXERCISE 1: DDL, DML & SQL Constraints

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1. Create the following tables with suitable constraints

   a. DEPARTMENT (DEPT_ID, DEPT_NAME).
   Constraints: Make DEPT_ID as the primary key and DEPT_NAME should not be null.

```
mysql> create table department_24mcs1017(dept_id int primary key,dept_name varchar(20) not null);
Query OK, 0 rows affected (0.05 sec)
```

   b. PROJECT (PROJECT_ID, PROJECT_NAME, DID)
   Constraints: Make PROJECT_ID as the primary key and PROJECT_NAME should not be null. DID will be the foreign keys for DEPARTMENT.

```
mysql> CREATE TABLE PROJECT_24MCS1017 (
    ->     PROJECT_ID INT PRIMARY KEY,
    ->     PROJECT_NAME VARCHAR(255) NOT NULL,
    ->     DID INT,
    ->     FOREIGN KEY (DID) REFERENCES DEPARTMENT_24MCS1017(DEPT_ID)
    -> );
Query OK, 0 rows affected (0.06 sec)
```

   c.EMPLOYEE(EMP_ID, NAME, GENDER, DID, PID, DOJ, AGE,LOCATION).
   Constraints: Make EMP_ID as the primary key. DID and PID will be the foreign keys for DEPARTMENT and PROJECT tables respectively. Only records with age above 21 years can be included in EMPLOYEE table. If the location is not specified, put the location as ‘CHENNAI’.

```
mysql> CREATE TABLE EMPLOYEE_24MCS1017 (
    ->     EMP_ID INT PRIMARY KEY,
    ->     NAME VARCHAR(255) NOT NULL,
    ->     GENDER CHAR(1) NOT NULL,
    ->     DID INT,
    ->     PID INT,
    ->     DOJ DATE NOT NULL,
    ->     AGE INT CHECK (AGE > 21),
    ->     LOCATION VARCHAR(255) DEFAULT 'CHENNAI',
    ->     FOREIGN KEY (DID) REFERENCES DEPARTMENT_24MCS1017(DEPT_ID),
    ->     FOREIGN KEY (PID) REFERENCES PROJECT_24MCS1017(PROJECT_ID)
    -> );
Query OK, 0 rows affected (0.07 sec)
```

2. Insert 5 departments into DEPARTMENT table.

```
mysql> INSERT INTO DEPARTMENT_24MCS1017 (DEPT_ID, DEPT_NAME) VALUES
    -> (101, 'Human Resources'),
    -> (102, 'Finance'),
    -> (103, 'Engineering'),
    -> (104, 'Marketing'),
    -> (105, 'Sales');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

3. Insert 5 projects into the PROJECT table.

```
mysql> INSERT INTO PROJECT_24MCS1017 (PROJECT_ID, PROJECT_NAME, DID) VALUES
    -> (1, 'Project 1', 101),
    -> (2, 'Project 2', 102),
    -> (3, 'Project 3', 103),
    -> (4, 'Project 4',104),
    -> (5, 'Project 5', 105);
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

4. Insert 5 Employees into the EMPLOYEE table. Ensure that all the constraint criteria are met.

```
mysql> INSERT INTO EMPLOYEE_24MCS1017(EMP_ID, NAME, GENDER, DID, PID, DOJ, AGE, LOCATION) VALUES
    -> (1001, ' ROHIT', 'M', 101, 1, '2024-01-15', 30, 'Bangalore'),
    -> (1002, 'KUMAR', 'M',102, 2, '2024-02-20', 28, 'Mumbai'),
    -> (1003, ' KRITI', 'F', 103, 3, '2024-03-10', 35, 'Delhi'),
    -> (1004, 'RAHUL ', 'M', 104, 4, '2024-04-25', 29, 'Chennai'),
    -> (1005, 'MAHESH', 'M', 105, 5, '2024-05-30', 23, 'Pune');
Query OK, 5 rows affected (0.00 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

5. Update the employee PID from 1 to 2 for the employee whose employee id is ‘1001’.

```
mysql> UPDATE EMPLOYEE_24MCS1017
    -> SET PID = 2
    -> WHERE EMP_ID = 1001;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

6. Update the employee NAME from ‘KUMAR’ to ‘KUMAAR’ for the employee whose name is ‘KUMAR’.

```
mysql> UPDATE EMPLOYEE_24MCS1017
    -> SET NAME = 'KUMAAR'
    -> WHERE NAME = 'KUMAR';
Query OK, 1 row affected (0.00 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> SELECT * FROM EMPLOYEE_24MCS1017;
+--------+--------+--------+------+------+------------+------+-----------+
| EMP_ID | NAME   | GENDER | DID  | PID  | DOJ        | AGE  | LOCATION  |
+--------+--------+--------+------+------+------------+------+-----------+
|   1001 |  ROHIT | M      |  101 |    2 | 2024-01-15 |   30 | Bangalore |
|   1002 | KUMAAR | M      |  102 |    2 | 2024-02-20 |   28 | Mumbai    |
|   1003 |  KRITI | F      |  103 |    3 | 2024-03-10 |   35 | Delhi     |
|   1004 | RAHUL  | M      |  104 |    4 | 2024-04-25 |   29 | Chennai   |
|   1005 | MAHESH | M      |  105 |    5 | 2024-05-30 |   23 | Pune      |
+--------+--------+--------+------+------+------------+------+-----------+
5 rows in set (0.00 sec)
```

7. Delete the list of female employees belonging to project 2.

```
mysql> DELETE FROM EMPLOYEE_24MCS1017
    -> WHERE GENDER = 'F' AND PID = 2;
Query OK, 0 rows affected (0.00 sec)
```

8. Delete the list of male employees belonging to project 1.

```
mysql> DELETE FROM EMPLOYEE_24MCS1017
    -> WHERE GENDER = 'M' AND PID = 1;
Query OK, 0 rows affected (0.00 sec)
```

9. Delete the projects that are under department 102

```
mysql> DELETE FROM EMPLOYEE_24MCS1017
    -> WHERE PID IN (SELECT PROJECT_ID FROM PROJECT_24MCS1017 WHERE DID = 102);
Query OK, 2 rows affected (0.01 sec)

mysql> DELETE FROM PROJECT_24MCS1017
    -> WHERE DID = 102;
Query OK, 1 row affected (0.00 sec)

mysql> SELECT * FROM PROJECT_24MCS1017;
+------------+--------------+------+
| PROJECT_ID | PROJECT_NAME | DID  |
+------------+--------------+------+
|          1 | Project 1    |  101 |
|          3 | Project 3    |  103 |
|          4 | Project 4    |  104 |
|          5 | Project 5    |  105 |
+------------+--------------+------+
4 rows in set (0.00 sec)
```

10. Demonstrate with some queries the various constraint violations pertaining to the tables created above.

```
mysql> INSERT INTO DEPARTMENT_24MCS1017 (DEPT_ID, DEPT_NAME) VALUES (101, 'RESEARCH');
ERROR 1062 (23000): Duplicate entry '101' for key 'department_24mcs1017.PRIMARY'
```

```
mysql> INSERT INTO PROJECT_24MCS1017 (PROJECT_ID, PROJECT_NAME, DID) VALUES (6, 'New Project', 999);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails (`db1`.`project_24mcs1017`, CONST
RAINT `project_24mcs1017_ibfk_1` FOREIGN KEY (`DID`) REFERENCES `department_24mcs1017` (`dept_id`))
mysql>
```