

1. Create a database named StudentManagement

Create DATABASE StudentManagement054;

```
mysql> Create DATABASE StudentManagement054;
Query OK, 1 row affected (0.03 sec)
```

2. Define the following tables with appropriate constraints:

a) TABLE 1: Students_054

Create table Students_054(StudentID INT PRIMARY KEY NOT NULL, FirstName varchar(50) NOT NULL, LastName varchar(50), Email VARCHAR(100) UNIQUE, DOB DATE NOT NULL, Courseid INT, FOREIGN KEY (courseid) REFERENCES Courses_054(Courseid));

```
mysql> Create table Students_054( StudentID INT PRIMARY KEY NOT NULL, FirstName
varchar(50) NOT NULL, LastName varchar(50), Email VARCHAR(100) UNIQUE, DOB DATE
NOT NULL, Courseid INT, FOREIGN KEY (courseid) REFERENCES Courses_054(Courseid)
);
Query OK, 0 rows affected (0.66 sec)
```

```
mysql> DESCRIBE Students_054;
+-----+-----+-----+-----+-----+
| Field | Type   | Null | Key  | Default | Extra |
+-----+-----+-----+-----+-----+
| StudentID | int    | NO   | PRI  | NULL    |       |
| FirstName | varchar(50) | NO   |       | NULL    |       |
| LastName  | varchar(50) | YES  |       | NULL    |       |
| Email     | varchar(100) | YES  | UNI  | NULL    |       |
| DOB        | date   | NO   |       | NULL    |       |
| Courseid  | int    | YES  | MUL  | NULL    |       |
+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

b) Table 2: Courses_054

Create table Courses_054(Courseid INT PRIMARY KEY NOT NULL, CourseName VARCHAR(100) NOT NULL UNIQUE, Credits INT DEFAULT 3);

```
mysql> Create table Courses_054( Courseid INT PRIMARY KEY NOT NULL, CourseName VARCHAR(100) NOT NULL UNIQUE, Credits INT DEFAULT 3);
Query OK, 0 rows affected (0.04 sec)
```

-> Table 2 must be Create first

```
mysql> Show tables;
+-----+
| Tables_in_StudentManagement054 |
+-----+
| Courses_054
| Students_054
+
2 rows in set (0.00 sec)
```

3. Insert records into the tables while ensuring the constraints are not violated.

a) Table 1: Students_054

```
Insert into Students_054 Values(1,"Nikki","Thakur",'nikki@gmail.com','2002-11-12',101),  
(2,'John','Deol','john@gmail.com','1998-7-12',102),  
(3,'Nikhil','Thakur','nikhil@gmail.com','2004-12-2',103),  
(4,'priya','Sharma','priya@gmail.com','1995-11-12',104),  
(5,'Navi','Singh','navi@gmail.com','2012-12-20',105),  
(6,'Shikha','Rani','shikha@gmail.com','2005-6-15',106),  
(7,'Shivani','Rajput','shivani@gmail.com','2007-10-10',107);
```

```
mysql> Insert into Students_054 Values(1,"Nikki","Thakur",'nikki@gmail.com','2002-11-12',101), (2,'John','Deol','john@gmail.com','1998-7-12',102), (3,'Nikhil','Thakur','nikhil@gmail.com','2004-12-2',103), (4,'priya','Sharma','priya@gmail.com','1995-11-12',104), (5,'Navi','Singh','navi@gmail.com','2012-12-20',105), (6,'Shikha','Rani','shikha@gmail.com','2005-6-15',106), (7,'Shivani','Rajput','shivani@gmail.com','2007-10-10',107);  
Query OK, 7 rows affected, 1 warning (0.02 sec)  
Records: 7 Duplicates: 0 Warnings: 1
```

```
mysql> SELECT* FROM Students_054;  
+-----+-----+-----+-----+-----+  
| StudentID | FirstName | LastName | Email | DOB | CourseId |  
+-----+-----+-----+-----+-----+  
| 1 | Nikki | Thakur | nikki@gmail.com | 2002-11-12 | 101 |  
| 2 | John | Deol | john@gmail.com | 1998-07-12 | 102 |  
| 3 | Nikhil | Thakur | nikhil@gmail.com | 2004-12-02 | 103 |  
| 4 | priya | Sharma | priya@gmail.com | 1995-11-12 | 104 |  
| 5 | Navi | Singh | navi@gmail.com | 2012-12-20 | 105 |  
| 6 | Shikha | Rani | shikha@gmail.com | 2005-06-15 | 106 |  
| 7 | Shivani | Rajput | shivani@gmail.com | 2007-10-10 | 107 |  
+-----+-----+-----+-----+-----+  
7 rows in set (0.00 sec)
```

b) Table 2: Courses_054

```
Insert into Courses_054 Values(101,'CS',4), (102,'DECO',2), (103,'OOP',4),  
(104,'SCIENCE',3), (105,'POP',1), (106,'DM',2), (107,'CT',4);
```

```
mysql> Insert into Courses_054 Values(101,'CS',4), (102,'DECO',2), (103,'OOP',4), (104,'SCIENCE',3), (105,'POP',1), (106,'DM',2), (107,'CT',4);  
Query OK, 7 rows affected (0.03 sec)  
Records: 7 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT* FROM Courses_054;  
+-----+-----+-----+  
| CourseId | CourseName | Credits |  
+-----+-----+-----+  
| 101 | CS | 4 |  
| 102 | DECO | 2 |  
| 103 | OOP | 4 |  
| 104 | SCIENCE | 3 |  
| 105 | POP | 1 |  
| 106 | DM | 2 |  
| 107 | CT | 4 |  
+-----+-----+-----+  
7 rows in set (0.00 sec)
```

4. Test the Constraints

1. Test 1: Insert a NULL value into a NOT NULL column.

```
Students_054 Values(8,null,'Thakur','anku@gmail.com','1996-10-8',104);
```

```
mysql> Insert into Students_054 Values(8,null,'Thakur','anku@gmail.com','1996-10-8',104);
ERROR 1048 (23000): Column 'FirstName' cannot be null
```

2. Test 2: Insert a duplicate value in the UNIQUE column.

Insert into Courses_054 VALUES (108,'CS',3);

```
mysql> Insert into Courses_054 VALUES  (108,'CS',3);
ERROR 1062 (23000): Duplicate entry 'CS' for key 'Courses_054.CourseName'
```

3. Test 3: Insert a record with an invalid FOREIGN KEY reference.

Insert into Students_054 Values(8,'Anku','Thakur','anku@gmail.com','1996-10-8',194);

```
mysql> Insert into Students_054 Values(8,'Anku','Thakur','anku@gmail.com','1996-10-8',194);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('StudentManagement054'.`Students_054`, CONSTRAINT `Students_054_ibfk_1` FOREIGN KEY (`CourseId`) REFERENCES `Courses_054` (`CourseId`))
```

5. Attempt following questions:

1. Write a query to display the names of students who were born after the year 2000.

seLECT FirstName,LastName FROM Students_054 where DOB>'2000-12-31';

```
mysql> seLECT FirstName,LastName  FROM Students_054 where DOB>'2000-12-31';
+-----+-----+
| FirstName | LastName |
+-----+-----+
| Nikki    | Thakur   |
| Nikhil   | Thakur   |
| Shikha   | Rani     |
| Shivant  | Rajput   |
+-----+-----+
4 rows in set (0.00 sec)
```

2. Write a query to update the course credits for "Computer Science" to 4.

Update Courses_054

SET Credits=4 where CourseName='CS';

```
mysql> Update Courses_054
      -> SET Credits=4 where CourseName='CS';
Query OK, 0 rows affected (0.00 sec)
Rows matched: 1  Changed: 0  Warnings: 0
```

```
mysql> SElect* FRon Courses_054;
+-----+-----+-----+
| CourseId | CourseName | Credits |
+-----+-----+-----+
| 101 | CS | 4 |
| 102 | DECO | 2 |
| 103 | OOP | 4 |
| 104 | SCIENCE | 3 |
| 105 | POP | 1 |
| 106 | DM | 2 |
| 107 | CT | 4 |
+-----+-----+-----+
7 rows in set (0.00 sec)
```

3. Write a query to delete a student record whose email is 'test@example.com'.

DElete from Students_054 where Email='navi@gmail.com';

```
mysql> DElete from Students_054 where Email='navi@gmail.com';
Query OK, 1 row affected (0.02 sec)
```

```
mysql> Select*FRom Students_054;
+-----+-----+-----+-----+-----+-----+
| StudentID | FirstName | LastName | Email           | DOB       | Courseid |
+-----+-----+-----+-----+-----+-----+
|      1 | Nikki     | Thakur    | nikki@gmail.com | 2002-11-12 |    101   |
|      2 | John       | Deol       | john@gmail.com  | 1998-07-12 |    102   |
|      3 | Nikhil    | Thakur    | nikhil@gmail.com | 2004-12-02 |    103   |
|      4 | priya      | Sharma    | priya@gmail.com | 1995-11-12 |    104   |
|      6 | Shikha     | Rani      | shikha@gmail.com | 2005-06-15 |    106   |
|      7 | Shivani    | Rajput    | shivani@gmail.com | 2007-10-10 |    107   |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

4. Write a query to find students who are not enrolled in any course.

Select* FROM Students_054 where Courseid=null;

```
mysql> Select* FROM Students_054 where Courseid=null;
Empty set (0.00 sec)
```

5. Test the UNIQUE constraint by inserting a duplicate email into the Students table.

Insert into Students_054 VAluess(8,'Anku','Thakur','john@gmail.com','1996-10-8',107);

```
mysql> Insert into Students_054 VAluess(8,'Anku','Thakur','john@gmail.com','1996-10-8',107);
ERROR 1062 (23000): Duplicate entry 'john@gmail.com' for key 'Students_054.Email'
```

6. Test the FOREIGN KEY constraint by inserting a student with a CourseID that does not exist in the Courses table

Insert into Students_054 VAluess(8,'Anku','Thakur','anku@gmail.com','1996-10-8',154);

```
mysql> Insert into Students_054 VAluess(8,'Anku','Thakur','anku@gmail.com','1996-10-8',154);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails ('StudentManagement054`.`Students_054`, CONSTRAINT `Students_054_ibfk_1` FOREIGN KEY (`Courseid`) REFERENCES `Courses_054` (`Courseid`))
```