

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 (0.06 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     |
| Shivani   | 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* 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)
```

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

DElete from Students_054 where [Email='navi@gmail.com'](mailto: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 VAlues(8,'Anku','Thakur','john@gmail.com','1996-10-8',107);
```

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

```
mysql> Insert into Students_054 VAlues(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`))
```