CSC 785- Information Retrieval
Project 3 – Blood Donation System
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1. Design a database: blood donation system and satisfy following:

   (a) A system in which data of Patient, data of donor, data of blood bank would be saved and will beinterrelation with each other.
   (b) DATA OF PATIENT: Patient Name, Patient Id, Patient Blood Group, Patent Disease
   (c) DATA OF DONAR: Donar Name, Donar Id, Donar Bood Group, Donar Medical report, Donar Address
   , Donar Contact number
   (d) DATA OF BLOOD BANK: Blood Bank Name, Blood Bank Address, Blood bank Donars name, Blood
   Bank Contact Number, Blood Bank Address

1. **Patient Table**- The Patient table stores information about patients. It has the following attributes:
   a. PatientId: A unique identifier for each patient.
   b. PatientName: The name of the patient.
   c. BloodGroup: The blood group of the patient.
   d. PatientDisease: Any disease or medical condition the patient may have.

```
mysql> CREATE TABLE Patient (     PatientId INT PRIMARY KEY,     PatientName
VARCHAR(255),     BloodGroup VARCHAR(5),     PatientDisease VARCHAR(255) );
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> INSERT INTO Patient (PatientId, PatientName, BloodGroup, PatientDisease) VALUES
(1, 'John Doe', 'A+', 'None'),     (2, 'Jane Smith', 'B-', 'Hypertension'),     (3, 'Michae
l Johnson', 'O+', 'Diabetes'),     (4, 'Emily Davis', 'AB+', 'None'),     (5, 'KC Santosh',
 'O-', 'Asthma'), (6, 'Srijana Raut', 'O-', 'Diabetes');
Query OK, 6 rows affected (0.01 sec)
Records: 6  Duplicates: 0  Warnings: 0
```

```
mysql> select * from patient;
+-----------+-----------------+------------+----------------+
| PatientId | PatientName     | BloodGroup | PatientDisease |
+-----------+-----------------+------------+----------------+
|         1 | John Doe        | A+         | None           |
|         2 | Jane Smith      | B-         | Hypertension   |
|         3 | Michael Johnson | O+         | Diabetes       |
|         4 | Emily Davis     | AB+        | None           |
|         5 | KC Santosh      | O-         | Asthma         |
|         6 | Srijana Raut    | O-         | Diabetes       |
+-----------+-----------------+------------+----------------+
6 rows in set (0.00 sec)
```

Note: I modify the Table Patient by adding one column with DonorID as foreign Key to show the relation between the two tables.

```
mysql> UPDATE Patient p
    -> JOIN Donor d ON p.BloodGroup = d.BloodGroup
    -> SET p.DonorId = d.DonorId;
Query OK, 6 rows affected (0.01 sec)
Rows matched: 6  Changed: 6  Warnings: 0
```

Now the Final Table Looks like.

```
mysql> select * from Patient;
+-----------+-----------------+------------+----------------+---------+
| PatientId | PatientName     | BloodGroup | PatientDisease | DonorId |
+-----------+-----------------+------------+----------------+---------+
|         1 | John Doe        | A+         | None           |       1 |
|         2 | Jane Smith      | B-         | Hypertension   |       2 |
|         3 | Michael Johnson | O+         | Diabetes       |       3 |
|         4 | Emily Davis     | AB+        | None           |       4 |
|         5 | KC Santosh      | O-         | Asthma         |       5 |
|         6 | Srijana Raut    | O-         | Diabetes       |       5 |
+-----------+-----------------+------------+----------------+---------+
6 rows in set (0.00 sec)
```

2. **Donor Table**: The Donor table stores information about individuals who are potential blood donors.It has the following attributes:
    a. DonorId: A unique identifier for each donor.
    b. DonorName: The name of the donor.
    c. BloodGroup: The blood group of the donor.
    d. MedicalReport: This field is assumed to store the medical report of the donor, but it's set as NULL for now.
    e. Address: The address of the donor.
    f. ContactNumber: The contact number of the donor.

```
mysql> INSERT INTO Donor (DonorId, DonorName, BloodGroup, MedicalReport, Address, ContactNu
mber)
    -> VALUES
    ->     (1, 'Sarah Brown', 'A+', NULL, '123 Main St', '555-123-4567'),
    ->     (2, 'Robert Lee', 'B-', NULL, '456 Elm St', '555-987-6543'),
    ->     (3, 'Susan White', 'O+', NULL, '789 Oak St', '555-321-7890'),
    ->     (4, 'Sristi Raut', 'AB+', NULL, '101 Pine St', '555-555-5555'),
    -> (5, 'Shreya Poudel', 'O-', NULL, '422 N Dakota', '984-123-8877');
Query OK, 5 rows affected (0.02 sec)
Records: 5  Duplicates: 0  Warnings: 0
```

```
mysql> select * from Donor;
+---------+---------------+------------+----------------------------+--------------+---------------+
| DonorId | DonorName     | BloodGroup | MedicalReport              | Address      | ContactNumber |
+---------+---------------+------------+----------------------------+--------------+---------------+
|       1 | Sarah Brown   | A+         | NULL                       | 123 Main St  | 555-123-4567  |
|       2 | Robert Lee    | B-         | NULL                       | 456 Elm St   | 555-987-6543  |
|       3 | Susan White   | O+         | NULL                       | 789 Oak St   | 555-321-7890  |
|       4 | Sristi Raut   | AB+        | NULL                       | 101 Pine St  | 555-555-5555  |
|       5 | Shreya Poudel | O-         | NULL                       | 422 N Dakota | 984-123-8877  |
+---------+---------------+------------+----------------------------+--------------+---------------+
5 rows in set (0.00 sec)
```

3. **BloodBank Table**: The BloodBank table stores information about blood banks or centers that collect and distribute blood.It has the following attributes:
    a. BloodBankName: A unique identifier for each blood bank.
    b. Address: The address of the blood bank.
    c. DonorName: This field is intended to reference the name of the donor associated with the blood bank.

Here, while creating the table BloodBank, I got an error related to the foreign key constraint on the DonorName column. To modify an existing table in MySQL to add a UNIQUE constraint to a column, I have used the ALTER TABLE statement. In this case, I want to add a UNIQUE constraint to the DonorName column in the Donor table.

```
mysql> ALTER TABLE Donor
    -> ADD CONSTRAINT UC_DonorName UNIQUE (DonorName);
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> CREATE TABLE BloodBank (DonorBloodBankName VARCHAR(255), Address VARCHAR(255),     DonorName VARCHAR(255),
    ContactNumber VARCHAR(15),     FOREIGN
KEY (DonorName) REFERENCES Donor(DonorName) );
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> select * from BloodBank;
+------------------------+--------------+---------------+---------------+
| BloodBankName          | Address      | DonorName     | ContactNumber |
+------------------------+--------------+---------------+---------------+
| City Blood Bank        | 123 Oak Ave  | Sristi Raut   | 555-111-2222  |
| Community Blood Center | 456 Elm St   | Sarah Brown   | 555-222-3333  |
| County Blood Services  | 202 Birch St | Shreya Poudel | 555-555-6666  |
| National Blood Center  | 101 Maple St | Susan White   | 555-444-5555  |
| Regional Blood Bank    | 789 Pine St  | Robert Lee    | 555-333-4444  |
+------------------------+--------------+---------------+---------------+
5 rows in set (0.01 sec)
```

Example Query

Example 1 - The query will return the names of patients with the blood group 'O-' from the Patient table.

```
mysql> SELECT
    ->     PatientName
    -> FROM
    ->     Patient
    -> WHERE
    ->     BloodGroup = 'O-';
+--------------+
| PatientName  |
+--------------+
| KC Santosh   |
| Srijana Raut |
+--------------+
2 rows in set (0.00 sec)
```

Example 2 - The query will return the names of donors who donated blood of type 'O-' along with the corresponding BloodBankAddress and BloodBank name from the BloodBank table.

```
mysql> SELECT
    ->     Donor.DonorName,
    ->     BloodBank.Address AS BloodBankAddress,
    ->     BloodBank.BloodBankName
    -> FROM
    ->     Donor
    -> JOIN
    ->     BloodBank
    -> ON
    ->     Donor.DonorName = BloodBank.DonorName
    -> WHERE
    ->     Donor.BloodGroup = 'O-';
+--------------+-----------------+----------------------+
| DonorName    | BloodBankAddress | BloodBankName        |
+--------------+-----------------+----------------------+
| Shreya Poudel | 202 Birch St    | County Blood Services |
+--------------+-----------------+----------------------+
1 row in set (0.00 sec)
```

Example 3: Retrieving the names of patients who have received blood from donors with a blood group of 'O-' along with the blood group of each patient. Including the name of the blood bank organization associated with each donor.

```
mysql> SELECT
    ->     p.PatientName AS PatientName,
    ->     p.BloodGroup AS PatientBloodGroup,
    ->     d.DonorName AS DonorName,
    ->     bb.BloodBankName AS BloodBankName
    -> FROM
    ->     Patient p
    -> JOIN
    ->     Donor d ON p.DonorId = d.DonorId
    -> JOIN
    ->     BloodBank bb ON d.DonorName = bb.DonorName
    -> WHERE
    ->     d.BloodGroup = 'O-';
+-------------+-------------------+--------------+----------------------+
| PatientName | PatientBloodGroup | DonorName    | BloodBankName        |
+-------------+-------------------+--------------+----------------------+
| KC Santosh  | O-                | Shreya Poudel | County Blood Services |
| Srijana Raut | O-                | Shreya Poudel | County Blood Services |
+-------------+-------------------+--------------+----------------------+
2 rows in set (0.01 sec)
```

Example 4: Retrieving the names of patients who have received blood from donors with a blood group of 'A+' along with the blood group of each patient. Including the name of the blood bank organization associated with each donor.

```
mysql> SELECT
    ->     p.PatientName AS PatientName,
    ->     p.BloodGroup AS PatientBloodGroup,
    ->     d.DonorName AS DonorName,
    ->     bb.BloodBankName AS BloodBankName
    -> FROM
    ->     Patient p
    -> JOIN
    ->     Donor d ON p.DonorId = d.DonorId
    -> JOIN
    ->     BloodBank bb ON d.DonorName = bb.DonorName
    -> WHERE
    ->     d.BloodGroup = 'A+';
+-------------+-------------------+-------------+-----------------------+
| PatientName | PatientBloodGroup | DonorName   | BloodBankName         |
+-------------+-------------------+-------------+-----------------------+
| John Doe    | A+                | Sarah Brown | Community Blood Center |
+-------------+-------------------+-------------+-----------------------+
1 row in set (0.00 sec)
```

Findings while doing Project 3

1. Ever table can have (but doesn't have to have) a primary key. The primary key of one table may also help to identify records in other tables.
    a. Blood Bank table have no primary key i.e., ID are not mentioned.
    b. The Blood_Bank table references the Donor table through the Donor_Name field. However, using the donor's name as a foreign key may not be the most effective way to establish this relationship because names are not guaranteed to be unique.
2. To associate as a foreign key that column should hold uniqueness in the table from where it is associated. We have DonorName in Blood Bank table which is the foreign key of Donar table. Thus, it should be unique constraint so that we can reference to foreign key as DonorName table.
3. No Direct relation between Patient's table and the Donor's table.
4. No Direct relation between Patient's table and the Blood_Bank table.
5. Blood bank Address is a duplicate column name in Blood_Bank table.
6. Also, if we go as real time then the blood group receiver and donor should also be matched while entering data.