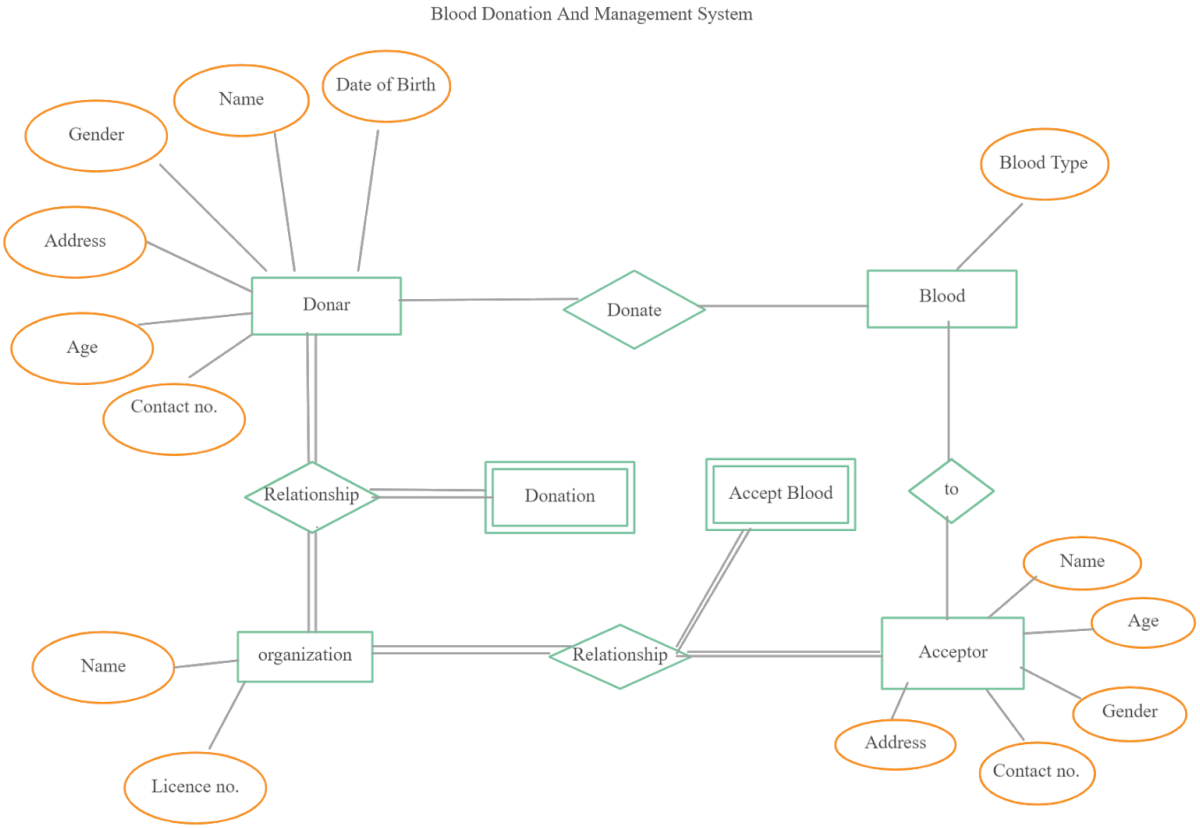
Blood Donation Database Management System

In day to day life we use databases everywhere. Blood donation databases are very important with nation wide significance. I am trying to create a database with separate tables in it containing all the information of donor, acceptor, blood group , organisation etc.

I will be using mysql databases and writing code in mysql client command line to create databases and tables.

ER Diagram and Relational Model:

An Entity Relationship (ER) diagram that describes the structure of a database with the help of a diagram. I am creating four tables of organisation, donor ,acceptor and blood (in the below diagram) for the project. The donor table consists of name , gender , address, date of birth, age, and contact number. The donor table is related to the blood table and organisation table. The organisation table consists of the name of the organisation and license number of the same. The organisation table is related to the donor and acceptor table.Blood table consists of blood type only and is related with donor and acceptor table. The acceptor table consists of name, age, address, contact number and gender. The acceptor table is related



With organization and blood tables. But there is no direct relation between donor and acceptor like in the real world . The organisation table handles the relation between donor and acceptor.

<u>Creating and interrelating tables</u>:

I am creating a database BDDMS .

CODE:

```
CREATE DATABASE BDDMS;
```

Firstly, I will create a table DONOR , which will have detailed information of the donor. The attributes are name, date of birth, gender, age, address . The table will also have a foreign key organisation id . The primary key is donor_id.

CODE:

```
CREATE TABLE DONOR(
   ->    DONOR_ID   INT             NOT NULL,
   ->    NAME VARCHAR (20)     NOT NULL,
   ->    AGE  INT             NOT NULL,
   ->    ADDRESS  CHAR (25) ,
   ->    GENDER VARCHAR (20),
   ->    CONTACT_NO VARCHAR(20),
   ->    DOB   DATE ,
   ->    ORGANISATION_ID   INT,
   ->    PRIMARY KEY (DONOR_ID)
   -> );
Query OK, 0 rows affected (3.61 sec)
```

CODE:

```
DESC DONOR;
```

Output:

```
+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| DONOR_ID        | int         | NO   | PRI | NULL    |       |
| NAME            | varchar(20) | NO   |     | NULL    |       |
| AGE             | int         | NO   |     | NULL    |       |
| ADDRESS         | char(25)    | YES  |     | NULL    |       |
| GENDER          | varchar(20) | YES  |     | NULL    |       |
| CONTACT_NO      | varchar(20) | YES  |     | NULL    |       |
| DOB             | date        | YES  |     | NULL    |       |
| ORGANISATION_ID | int         | YES  |     | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
8 rows in set (0.22 sec)
```

CODE:

```
mysql> CREATE TABLE ORGANISATION(
    ->    NAME VARCHAR (20)     NOT NULL,
    ->    LISCENCE_NO VARCHAR (20)     NOT NULL,
    ->    ORGANISATION_ID   INT,
    ->    PRIMARY KEY (ORGANISATION_ID)
    -> );
Query OK, 0 rows affected (1.19 sec)
```

Output:

```
DESC ORGANISATION;

+-----------------+-------------+------+-----+---------+-------+
| Field           | Type        | Null | Key | Default | Extra |
+-----------------+-------------+------+-----+---------+-------+
| NAME            | varchar(20) | NO   |     | NULL    |       |
| LISCENCE_NO     | varchar(20) | NO   |     | NULL    |       |
| ORGANISATION_ID | int         | NO   | PRI | NULL    |       |
+-----------------+-------------+------+-----+---------+-------+
3 rows in set (0.08 sec)
```

Now, I add foreign key organisation_id to the donor table which references the organisation table's organisaion_id.

CODE:

```
ALTER TABLE DONOR
    -> ADD FOREIGN KEY (ORGANISATION_ID) REFERENCES
ORGANISATION(ORGANISATION_ID);
Query OK, 0 rows affected (2.70 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Now, I will create the blood table containing donor_id and blood_gr.

```
CREATE TABLE BLOOD(
    ->     SERIAL_NO INT  NOT NULL,
    ->     BLOOD_GR VARCHAR (20)     NOT NULL,
    ->     DONOR_ID   INT,
    ->     PRIMARY KEY (SERIAL_NO)
```

```
   ->     );
Query OK, 0 rows affected (0.35 sec)
```

Now I will create a foreign key serial_no to the donor table which refers to the serial_no blood table.

```
mysql> ALTER TABLE DONOR
   -> ADD SERIAL_NO INT;
Query OK, 0 rows affected (1.54 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql>  ALTER TABLE DONOR
   ->  ADD FOREIGN KEY (SERIAL_NO) REFERENCES BLOOD(SERIAL_NO);
Query OK, 0 rows affected (3.56 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

Now I will create an acceptor table. The donor_id is the foreign key here referring to the donor table's donor_id.

```
mysql>  CREATE TABLE ACCEPTOR(
   ->       ACCEPTOR_ID INT          NOT NULL,
   ->       DONOR_ID   INT           NOT NULL,
   ->       NAME VARCHAR (20)     NOT NULL,
   ->       AGE  INT             NOT NULL,
   ->       ADDRESS  CHAR (25) ,
   ->       GENDER VARCHAR (20),
   ->       CONTACT_NO VARCHAR(20),
   ->       PRIMARY KEY (ACCEPTOR_ID),
   ->       FOREIGN KEY (DONOR_ID) REFERENCES DONOR(DONOR_ID)
   ->     );
Query OK, 0 rows affected (0.79 sec)
```

Now I will be adding data into each table.

Firstly I will enter data in the organisation table.

```
INSERT INTO ORGANISATION(ORGANISATION_ID, NAME,LISCENCE_NO)
VALUES ('100', 'SURAKSHA', 'L1')
VALUES ('101', 'DSHA', 'L2')
VALUES ('102', 'APOLLO', 'L3')
VALUES ('103', 'NARAYANA', 'L4');
```

Output:

```
mysql> select * from organisation;
+----------+-------------+-----------------+
| NAME     | LISCENCE_NO | ORGANISATION_ID |
+----------+-------------+-----------------+
| SURAKSHA | L1          |             100 |
| DISHA    | L2          |             101 |
| APOLLO   | L3          |             102 |
| NARAYANA | L4          |             103 |
+----------+-------------+-----------------+
4 rows in set (0.06 sec)
```

Now I will enter data into the blood table.

Code:

```
INSERT INTO BLOOD(SERIAL_NO, BLOOD_GR,DONOR_ID)
VALUES (1, 'A+',1),
VALUES (2, 'B-', 2),
VALUES (3, 'O+', 4),
VALUES (4, 'O+', 4);
```

Output:

```
mysql> select * from blood;
+-----------+----------+----------+
| SERIAL_NO | BLOOD_GR | DONOR_ID |
+-----------+----------+----------+
```

```
|        1 | A+       |        1 |
|        2 | B-       |        2 |
|        3 | O+       |        4 |
|        4 | O+       |        4 |
+-----------+----------+----------+
4 rows in set (0.00 sec)
```

I will add date and time for donation and acceptance table now.

```
ALTER TABLE DONOR
ADD DONATION_DATE DATE;

ALTER TABLE DONOR
ADD DONATION_TIME TIME;

ALTER TABLE ACCEPTOR
ADD ACCEPTOR_DATE DATE;

ALTER TABLE ACCEPTOR
ADD ACCEPTOR_TIME TIME;
```

Now I will enter data into donor table.

Code:

```
INSERT INTO DONOR(DONOR_ID, NAME,AGE, ADDRESS,
GENDER,CONTACT_NO,DOB,ORGANISATION_ID,SERIAL_NO,DONATION_DATE,DONATION
_TIME)
VALUES ('1', 'ARKADIP GHOSH', '24', 'KOLKATA', 'MALE', '55555',DATE
'2000-1-1',100,1,DATE '2020-12-17','08:00:00');
VALUES ('2', 'CENA', '34', 'LA', 'MALE', '66666',DATE '1970-1-1',101,1,DATE
'2020-12-18','09:00:00');
VALUES ('3', 'ROCK', '44', 'NEWYORK', 'MALE', '77777',DATE '1980-1-1',102,1,DATE
'2020-12-19','10:00:00');
VALUES ('4', 'TRUMP', '64', 'WASHINGTON', 'MALE', '77777',DATE '1950-1-1',103,1,DATE
'2020-12-20','11:00:00');
```

Output:

```
mysql> SELECT * FROM DONOR;
```

```
+----------+--------------+-----+-----------+--------+-----------+-----------+----------------+----------+---------
------+--------------+
| DONOR_ID | NAME         | AGE | ADDRESS    | GENDER | CONTACT_NO | DOB       |
ORGANISATION_ID | SERIAL_NO | DONATION_DATE | DONATION_TIME |
+----------+--------------+-----+-----------+--------+-----------+-----------+----------------+----------+---------
------+--------------+
|       1 | ARKADIP GHOSH |  24 | KOLKATA    | MALE   | 55555      | 2000-01-01 |
100 |         1 | 2020-12-17    | 08:00:00      |
|       2 | CENA          |  34 | LA         | MALE   | 66666      | 1970-01-01 |           101 |         1
| 2020-12-18    | 09:00:00      |
|       3 | ROCK          |  44 | NEWYORK    | MALE   | 77777      | 1980-01-01 |           102 |
1 | 2020-12-19    | 10:00:00      |
|       4 | TRUMP         |  64 | WASHINGTON | MALE   | 77777      | 1950-01-01 |           103
|         1 | 2020-12-20    | 11:00:00      |
+----------+--------------+-----+-----------+--------+-----------+-----------+----------------+----------+---------
------+--------------+
4 rows in set (0.00 sec)
```

Now I will change the primary key of the donor and acceptor table so that we can hold multiple rows of one donor and one particular acceptor.

Code:

```
ALTER TABLE ACCEPTOR DROP PRIMARY KEY, ADD PRIMARY
KEY(ACCEPTOR_ID,ACCEPTOR_DATE,ACCEPTOR_TIME);
 ALTER TABLE DONOR DROP PRIMARY KEY, ADD PRIMARY
KEY(DONOR_ID,DONATION_DATE,DONATION_TIME);
```

Now I will add data into the acceptor table.

code:

```
INSERT INTO ACCEPTOR(ACCEPTOR_ID,DONOR_ID, NAME,AGE, ADDRESS,
GENDER,CONTACT_NO,ACCEPTOR_DATE ,ACCEPTOR_TIME)
VALUES ('10', '1 ', 'VINCE','50','US','MALE','11111',DATE  '2021-2-2','10:00:00'),
VALUES ('10', '1 ', 'VINCE','50','US','MALE','11111',DATE  '2021-3-2','10:00:00'),
VALUES ('11', '3 ', 'SHANE','40','US','MALE','32111',DATE  '2021-3-2','20:00:00'),
VALUES ('12', '2 ', 'STEPH','53','US','FEMALE','22311',DATE  '2021-3-2','10:00:00'),
```

Output:

```
mysql> SELECT * FROM ACCEPTOR;
+-------------+----------+-------+-----+---------+--------+------------+--------------+--------------+
| ACCEPTOR_ID | DONOR_ID | NAME  | AGE | ADDRESS | GENDER | CONTACT_NO |
ACCEPTOR_DATE | ACCEPTOR_TIME |
+-------------+----------+-------+-----+---------+--------+------------+--------------+--------------+
|         10 |        1 | VINCE |  50 | US      | MALE   | 11111      | 2021-02-02   | 10:00:00     |
|         10 |        1 | VINCE |  50 | US      | MALE   | 11111      | 2021-03-02   | 10:00:00     |
|         11 |        3 | SHANE |  40 | US      | MALE   | 32111      | 2021-03-02   | 20:00:00
|
|         12 |        2 | STEPH |  53 | US      | FEMALE | 22311      | 2021-03-02   | 10:00:00
|
+-------------+----------+-------+-----+---------+--------+------------+--------------+--------------+
4 rows in set (0.09 sec)
```

So now I have completed entering data into each table and removed the redundancy also from the donor and acceptor table.

Running queries:

1. Show all tables in the database.

Solution:

code:

```
mysql> SHOW TABLES;
```

Output:

```
+-----------------+
| Tables_in_bddms |
+-----------------+
| acceptor        |
| blood           |
| donor           |
| organisation    |
+-----------------+
4 rows in set (0.10 sec)
```

```

```

2. SHOW NAME OF ALL DONORS ALONG WITH THEIR DATE AND TIME.

Solution:

code:

```
mysql> SELECT NAME,DONATION_DATE, DONATION_TIME FROM DONOR;
```

Output:

```
+--------------+---------------+---------------+
| NAME         | DONATION_DATE | DONATION_TIME |
+--------------+---------------+---------------+
| ARKADIP GHOSH | 2020-12-17    | 08:00:00      |
| CENA          | 2020-12-18    | 09:00:00      |
| ROCK          | 2020-12-19    | 10:00:00      |
| TRUMP         | 2020-12-20    | 11:00:00      |
+--------------+---------------+---------------+
4 rows in set (0.00 sec)
```

3. Select the NAME, date and time of the acceptors who have taken blood from ARKADIP GHOSH.

code:

```
mysql> SELECT ACCEPTOR.NAME,ACCEPTOR_DATE,ACCEPTOR_TIME FROM
(DONOR,ACCEPTOR) WHERE DONOR.DONOR_ID=ACCEPTOR.DONOR_ID AND
DONOR.NAME="ARKADIP GHOSH";
```

Output:

```
+-------+---------------+---------------+
| NAME  | ACCEPTOR_DATE | ACCEPTOR_TIME |
+-------+---------------+---------------+
| VINCE | 2021-02-02    | 10:00:00      |
| VINCE | 2021-03-02    | 10:00:00      |
```

```
+-------+---------------+---------------+
```

4. Show name of persons who had blood transactions(acceptor and donor both) on 2020-02-02.

Solution:

code:

```
mysql> select A.NAME AS ACCEPTOR, D.NAME AS DONOR,D.DONATION_DATE AS DONATION_DATE,A.ACCEPTOR_DATE AS ACCEPTANCE_DATE FROM(DONOR D, ACCEPTOR A) WHERE D.DONATION_DATE='2021-03-02' OR A.ACCEPTOR_DATE='2021-03-02';
```

Output:

```
+----------+---------------+---------------+-----------------+
| ACCEPTOR | DONOR         | DONATION_DATE | ACCEPTANCE_DATE |
+----------+---------------+---------------+-----------------+
| STEPH    | ARKADIP GHOSH | 2020-12-17    | 2021-03-02      |
| SHANE    | ARKADIP GHOSH | 2020-12-17    | 2021-03-02      |
| VINCE    | ARKADIP GHOSH | 2020-12-17    | 2021-03-02      |
| STEPH    | ARKADIP GHOSH | 2021-03-02    | 2021-03-02      |
| SHANE    | ARKADIP GHOSH | 2021-03-02    | 2021-03-02      |
| VINCE    | ARKADIP GHOSH | 2021-03-02    | 2021-03-02      |
| VINCE    | ARKADIP GHOSH | 2021-03-02    | 2021-02-02      |
| STEPH    | CENA          | 2020-12-18    | 2021-03-02      |
| SHANE    | CENA          | 2020-12-18    | 2021-03-02      |
| VINCE    | CENA          | 2020-12-18    | 2021-03-02      |
| STEPH    | ROCK          | 2020-12-19    | 2021-03-02      |
| SHANE    | ROCK          | 2020-12-19    | 2021-03-02      |
| VINCE    | ROCK          | 2020-12-19    | 2021-03-02      |
| STEPH    | TRUMP         | 2020-12-20    | 2021-03-02      |
| SHANE    | TRUMP         | 2020-12-20    | 2021-03-02      |
| VINCE    | TRUMP         | 2020-12-20    | 2021-03-02      |
+----------+---------------+---------------+-----------------+
16 rows in set (0.00 sec)

+-----------------+
4 rows in set (0.10 sec)
```

5. Show all DONOR AND ACCEPTOR WHOSE BLOOD GROUP IS ‘A+’ ALONG WITH THEIR PHONE NUMBER.

Solution:

code:

```
mysql> select DISTINCT A.NAME AS ACCEPTOR, D.NAME AS DONOR,D.CONTACT_NO AS DONOR_CONTACT_NO,A.CONTACT_NO AS ACCEPTOR_CONTACT_NO,B.BLOOD_GR AS BLOOD_GROUP FROM(DONOR D, ACCEPTOR A,BLOOD B) WHERE D.DONOR_ID=A.DONOR_ID AND D.DONOR_ID =B.DONOR_ID AND B.BLOOD_GR='A+';
```

Output:

```
+----------+---------------+------------------+---------------------+-------------+
| ACCEPTOR | DONOR         | DONOR_CONTACT_NO | ACCEPTOR_CONTACT_NO | BLOOD_GROUP |
+----------+---------------+------------------+---------------------+-------------+
| VINCE    | ARKADIP GHOSH | 55555            | 11111               | A+          |
+----------+---------------+------------------+---------------------+-------------+
1 row in set (0.05 sec)
```