DBMS – Mini Project

Database to Manage Blood Donations

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Short Description and Scope of the Project

Emergencies occur every second. Availability of blood is very important without which they could have major setbacks. Every year India requires 40 million units of 250cc blood, out of which only a meagre 500,000 units of blood are available. The database system I created is a Blood Bank System that helps us manage various blood bank operations effectively.
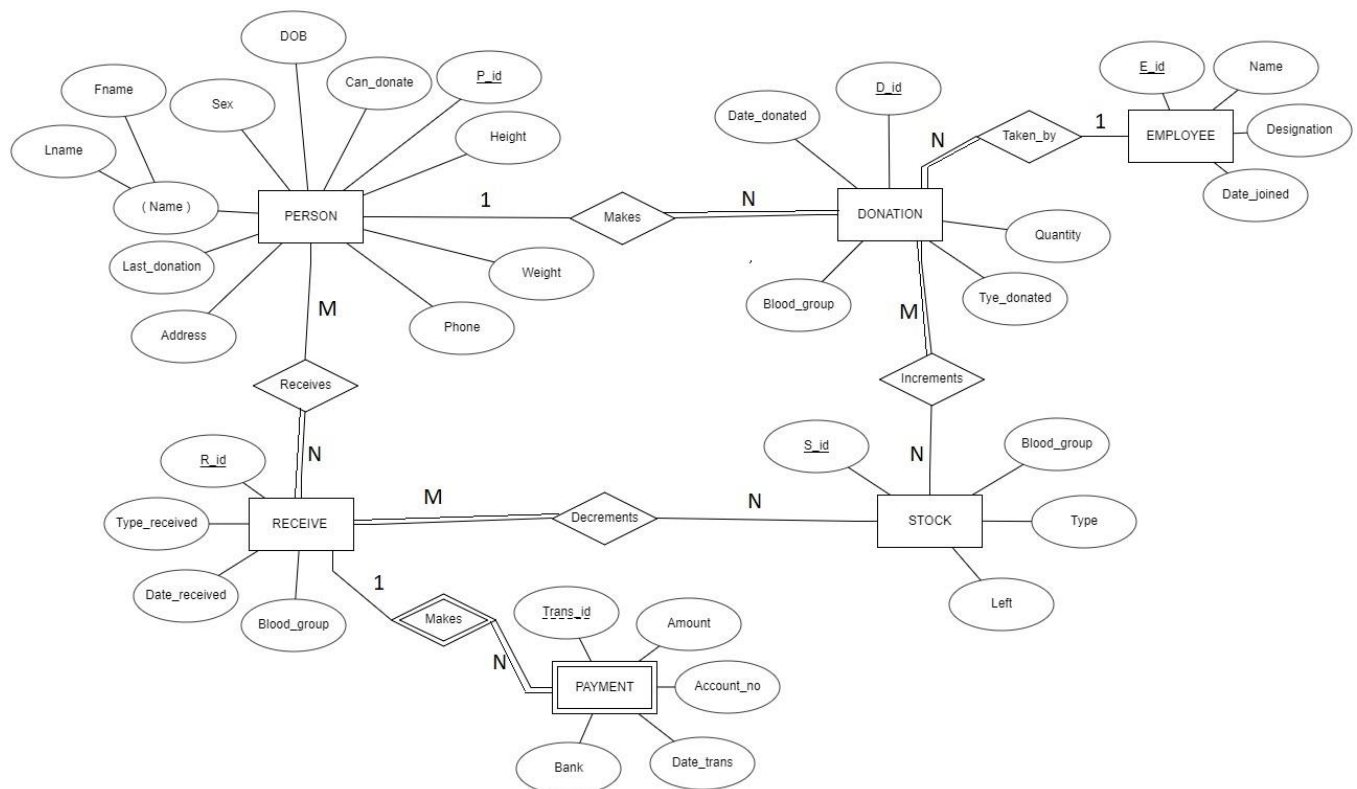
The project consists of a table to register users and store their details, a table to record the donations made and a table to record the donations received by users. These tables are further supported with a table for maintaining the stock, one for payment details and one for recording nurse details.

The software is written in python with Tkinter as the user interface. It is supported by a MySQL database to store all the information mentioned above. This software is made for a social cause and to help society.
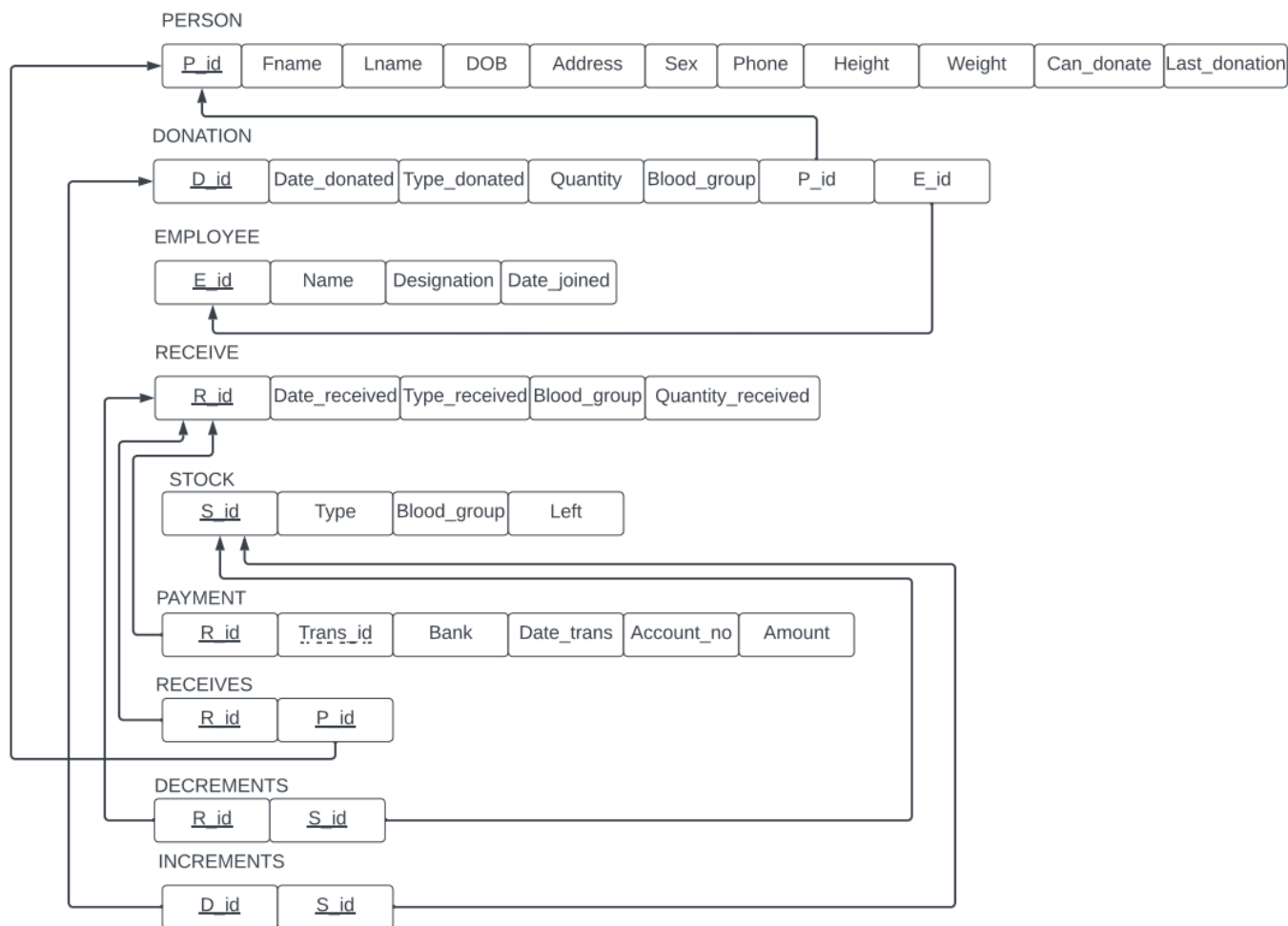
Advantages of this blood bank system:

• Encourages blood donors to donate as the system tells every necessary detail they need to know.

• Helps people find blood donors in times of need and emergency.

ER Diagram

Database to Manage Blood Donations

Relational Schema

PERSON

P_id	Fname	Lname	DOB	Address	Sex	Phone	Height	Weight	Can_donate	Last_donation

DONATION

D_id	Date_donated	Type_donated	Quantity	Blood_group	P_id	E_id

EMPLOYEE

E_id	Name	Designation	Date_joined

RECEIVE

R_id	Date_received	Type_received	Blood_group	Quantity_received

STOCK

S_id	Type	Blood_group	Left

PAYMENT

R_id	Trans_id	Bank	Date_trans	Account_no	Amount

RECEIVES

R_id	P_id

DECREMENTS

R_id	S_id

INCREMENTS

D_id	S_id

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DDL Statements – Building the Database

1) CREATE – Creation of Tables

    a. 461_Person

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_PERSON (
    ->      pid char(5),
    ->      fname varchar(15) NOT NULL,
    ->      lname varchar(15) NOT NULL,
    ->      DOB date,
    ->      `address` varchar(50),
    ->      sex char,
    ->      phone int,
    ->      height decimal(5,2),
    ->      `weight` decimal(5,2),
    ->      can_donate char NOT NULL,
    ->      last_donation date
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.027 sec)
```
Fig. 1a

    b. 461_Donation

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_DONATION (
    ->      did char(5),
    ->      date_donated date NOT NULL,
    ->      type_donated varchar(20) NOT NULL,
    ->      quantity decimal(5,2) NOT NULL,
    ->      blood_group varchar(3) DEFAULT NULL,
    ->      pid char(5) DEFAULT NULL,
    ->      eid char(5) DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.049 sec)
```
Fig. 1b

    c. 461_Employee

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_EMPLOYEE (
    ->      eid char(5) DEFAULT NULL,
    ->      `name` varchar(15) NOT NULL,
    ->      designation varchar(20) DEFAULT NULL,
    ->      date_of_joining date DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.067 sec)
```
Fig. 1c

    d. 461_Receive

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_RECEIVE (
    ->      rid char(5),
    ->      date_received date NOT NULL,
    ->      type_received varchar(20) NOT NULL,
    ->      blood_group char DEFAULT NULL,
    ->      quantity_received decimal(5,2) NOT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.070 sec)
```
Fig. 1d

    e. 461_Stock

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_STOCK (
    ->      `sid` char(5),
    ->      `type` varchar(20) NOT NULL,
    ->      `blood_group` varchar(3) DEFAULT NULL,
    ->      `left` decimal(5,2) NOT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.027 sec)
```
Fig. 1e

f.   461_Payment

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_PAYMENT (
    ->     rid char(5) DEFAULT NULL,
    ->     transaction_id int(11) NOT NULL,
    ->     bank varchar(20) DEFAULT NULL,
    ->     date_trans date NOT NULL,
    ->     account_no varchar(20) DEFAULT NULL,
    ->     amount decimal(10,2) DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.064 sec)
```
Fig. 1f

g.   461_Receives (RENAMED TO 461_Becomes)

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_RECEIVES (
    ->     rid char(5) DEFAULT NULL,
    ->     pid char(5) DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.071 sec)
```
Fig. 1g

h.   461_Decrements

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_DECREMENTS (
    ->     rid char(5) DEFAULT NULL,
    ->     `sid` char(5) DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.064 sec)
```
Fig. 1h

i.   461_Increments

```
MariaDB [pes1ug20cs461_blood_bank]> CREATE TABLE 461_INCREMENTS (
    ->     did char(5) DEFAULT NULL,
    ->     `sid` char(5) DEFAULT NULL
    -> ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
Query OK, 0 rows affected (0.071 sec)
```
Fig. 1i

2) ALTER

a.   To add Primary Key

```
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_PERSON`
    ->     ADD CONSTRAINT `pk_person` PRIMARY KEY (`pid`);
Query OK, 0 rows affected, 1 warning (0.042 sec)
Records: 0  Duplicates: 0  Warnings: 1
```

```
MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_DONATION`
    ->     ADD CONSTRAINT `pk_donation` PRIMARY KEY (`did`);
Query OK, 0 rows affected, 1 warning (0.046 sec)
Records: 0  Duplicates: 0  Warnings: 1

MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_EMPLOYEE`
    ->     ADD CONSTRAINT `pk_employee` PRIMARY KEY (`eid`);
Query OK, 0 rows affected, 1 warning (0.039 sec)
Records: 0  Duplicates: 0  Warnings: 1

MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_RECEIVE`
    ->     ADD CONSTRAINT `pk_receive` PRIMARY KEY (`rid`);
Query OK, 0 rows affected, 1 warning (0.038 sec)
Records: 0  Duplicates: 0  Warnings: 1

MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_STOCK`
    ->     ADD CONSTRAINT `pk_stock` PRIMARY KEY (`sid`);
Query OK, 0 rows affected, 1 warning (0.032 sec)
Records: 0  Duplicates: 0  Warnings: 1
```
Fig. 2a(i)

```
MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE `461_PAYMENT`
    ->     ADD CONSTRAINT `pk_payment` PRIMARY KEY (`transaction_id`);
Query OK, 0 rows affected, 1 warning (0.048 sec)
Records: 0  Duplicates: 0  Warnings: 1
```
Fig. 2a(ii)

b. Foreign Key Constraints

Fig. 2b

c. Modifying datatype

Fig. 2c

d. Renaming a Table

Fig. 2d

3) DROP and TRUNCATE

a. TRUNCATE on 461_Person

Fig. 3a

    b. Table 461_Person was deleted using DROP statement

```
MariaDB [pes1ug20cs461_blood_bank]> drop table 461_person;
Query OK, 0 rows affected (0.040 sec)

MariaDB [pes1ug20cs461_blood_bank]> desc 461_person;
ERROR 1146 (42S02): Table 'pes1ug20cs461_blood_bank.461_person' doesn't exist
MariaDB [pes1ug20cs461_blood_bank]>
```

Fig. 3b

  4) Adding DEFAULT and CHECK Constraints

    a. CHECK

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PERSON VALUES("P_50","Lakshmi","Swamy","2008-07-17","M G Road"
,'Girl',8378296214,144,48,'N',NULL);
ERROR 4025 (23000): CONSTRAINT `check_gender` failed for `pes1ug20cs461_blood_bank`.`461_person`
MariaDB [pes1ug20cs461_blood_bank]>
```

```
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE 461_Person
    ->     ADD CONSTRAINT check_gender CHECK (sex = 'M' OR sex = 'F'),
    ->     ADD CONSTRAINT check_can_donate CHECK (can_donate = 'Y' OR can_donate = 'N');
Query OK, 19 rows affected, 15 warnings (0.061 sec)
Records: 19  Duplicates: 0  Warnings: 15
```
Fig. 4a

    b. DEFAULT

```
MariaDB [pes1ug20cs461_blood_bank]> ALTER TABLE 461_Person
    ->     ALTER can_donate SET DEFAULT 'N';
Query OK, 0 rows affected (0.009 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PERSON VALUES("P_02","Ravi","Shankar","2010-09-30","M G Road",'F',8378692214,152,58,DEFAULT,NULL)
    -> ;
Query OK, 1 row affected, 1 warning (0.004 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_person where pid = 'P_02';
+------+-------+---------+------------+----------+-----+------------+--------+--------+------------+---------------+
| pid  | fname | lname   | DOB        | address  | sex | phone      | height | weight | can_donate | last_donation |
+------+-------+---------+------------+----------+-----+------------+--------+--------+------------+---------------+
| P_02 | Ravi  | Shankar | 2010-09-30 | M G Road | F   | 2147483647 | 152.00 | 58.00  | N          | NULL          |
+------+-------+---------+------------+----------+-----+------------+--------+--------+------------+---------------+
1 row in set (0.001 sec)
```

Fig. 4b

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Populating the Database

Under database pes1ug20cs461_blood_bank

```
MariaDB [pes1ug20cs461_blood_bank]> show tables;
+----------------------------------+
| Tables_in_pes1ug20cs461_blood_bank |
+----------------------------------+
| 461_becomes                      |
| 461_decrements                   |
| 461_donation                     |
| 461_employee                     |
| 461_increments                   |
| 461_payment                      |
| 461_person                       |
| 461_receive                      |
| 461_stock                        |
+----------------------------------+
9 rows in set (0.002 sec)
```

1) Insertion using CSV

```
MariaDB [pes1ug20cs461_blood_bank]> LOAD DATA INFILE 'D:/Tanvi/PES/Sem5/301_DBMS/Project/Person.csv'
    -> INTO TABLE 461_PERSON
    -> COLUMNS TERMINATED BY ','
    -> OPTIONALLY ENCLOSED BY '"'
    -> ESCAPED BY '"'
    -> LINES TERMINATED BY '\n'
    -> IGNORE 1 LINES;
Query OK, 20 rows affected, 55 warnings (0.008 sec)
Records: 20  Deleted: 0  Skipped: 0  Warnings: 55

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_person;
+------+----------+-----------+------------+------------------------+-----+------------+--------+--------+------------+---------------+
| pid  | fname    | lname     | DOB        | address                | sex | phone      | height | weight | can_donate | last_donation |
+------+----------+-----------+------------+------------------------+-----+------------+--------+--------+------------+---------------+
| P_54 | Reinald  | Cocks     | 1996-10-08 | Mirza road             | M   | 2147483647 | 175.00 | 68.00  | Y          | 0000-00-00    |
| P_20 | Jacques  | Karlmann  | 1990-08-06 | JC Road                | M   | 2147483647 | 162.00 | 72.00  | Y          | 2019-08-05    |
| P_29 | Philbert | Nail      | 1996-09-23 | Anna Sali              | F   | 2147483647 | 167.00 | 74.00  | N          | 0000-00-00    |
| P_74 | Wilburt  | Grinaway  | 1979-07-26 | 14, Kailsh Marg        | M   | 2147483647 | 159.00 | 69.00  | Y          | 2021-07-26    |
| P_57 | Ravi     | Svanini   | 2005-05-12 | 5, Lohia Garden        | M   | 2147483647 | 142.00 | 56.00  | N          | 0000-00-00    |
| P_30 | Lynn     | Membry    | 2020-06-18 | 1, Pink Street         | F   | 2147483647 | 95.00  | 10.00  | N          | 0000-00-00    |
| P_15 | Dunn     | Mungin    | 2015-05-24 | 3, Blue Avenue         | M   | 2147483647 | 126.00 | 25.00  | N          | 0000-00-00    |
| P_79 | Winifred | Elner     | 1968-07-10 | 4, Banyan Avenie       | F   | 2147483647 | 165.00 | 80.00  | Y          | 0000-00-00    |
| P_66 | Dickie   | MacPharlain | 2000-06-17 | 6, Poes Garden       | M   | 2147483647 | 174.00 | 63.00  | N          | 0000-00-00    |
| P_32 | Kelly    | Gorrick   | 1998-11-18 | 7, Dhamaka street      | M   | 2147483647 | 163.00 | 59.00  | Y          | 2022-09-23    |
| P_13 | Pebrook  | Kits      | 2004-06-11 | 8, Clone Colony        | M   | 2147483647 | 139.00 | 62.00  | N          | 0000-00-00    |
| P_09 | Kareem   | Collet    | 2010-07-23 | 56, Brigade Road       | M   | 2147483647 | 128.00 | 40.00  | N          | 0000-00-00    |
| P_52 | Simonette | Jellett  | 2019-06-01 | Lavelle Road           | F   | 2147483647 | 101.00 | 21.00  | N          | 0000-00-00    |
| P_48 | L;urette | Skells    | 1955-09-16 | Church Street, Bangalore | F | 2147483647 | 164.00 | 71.00  | N          | 0000-00-00    |
| P_68 | Patrick  | Grogan    | 1970-12-31 | American Street        | M   | 2147483647 | 178.00 | 77.00  | Y          | 2020-04-17    |
| P_41 | Alair    | O'Brien   | 1987-01-25 | T Nagar                | M   | 2147483647 | 161.00 | 93.00  | N          | 0000-00-00    |
| P_34 | Hastings | Arbon     | 1986-05-18 | M G Road, Bangalore    | M   | 2147483647 | 157.00 | 66.00  | Y          | 0000-00-00    |
| P_90 | Rose     | Govey     | 2008-07-17 | M G Road               | F   | 2147483647 | 144.00 | 48.00  | N          | 0000-00-00    |
| P_15 | Honor    | Davall    | 2014-09-24 | NAL Wind Tunnel Road   | F   | 1349988838 | 138.00 | 58.00  | N          | 0000-00-00    |
| P_92 | Lethia   | Beckley   | 2018-04-21 | Bunder Road            | F   | 2147483647 | 123.00 | 22.00  | N          | 0000-00-00    |
+------+----------+-----------+------------+------------------------+-----+------------+--------+--------+------------+---------------+
20 rows in set (0.001 sec)
```

2) Insertion using INSERT INTO

   a. Type 1

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_EMPLOYEE (`eid`,`name`,`designation`,`date_of_joining`)VALUES
    -> ("E_98","Bev","Nurse","2019-04-28"),
    -> ("E_18","Kelwin","Sr Nurse", "2018-01-02"),
    -> ("E_99","Gwenni","Nurse","2019-09-20"),
    -> ("E_43","Andriette","Jr Nurse","2020-08-12"),
    -> ("E_83","Stevy","Jr Nurse","2020-11-15");
Query OK, 5 rows affected (0.004 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_employee
    -> ;
+------+-----------+-------------+----------------+
| eid  | name      | designation | date_of_joining |
+------+-----------+-------------+----------------+
| E_98 | Bev       | Nurse       | 2019-04-28     |
| E_18 | Kelwin    | Sr Nurse    | 2018-01-02     |
| E_99 | Gwenni    | Nurse       | 2019-09-20     |
| E_43 | Andriette | Jr Nurse    | 2020-08-12     |
| E_83 | Stevy     | Jr Nurse    | 2020-11-15     |
+------+-----------+-------------+----------------+
5 rows in set (0.001 sec)
```

   b. Type 2

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```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_35","2019-07-20","Platelets","A-",465);
Query OK, 1 row affected (0.030 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_47","2022-07-19","Blood","AB+",470);
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_48","2018-10-04","Blood","O+",430);
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_72","2021-03-10","Plasma","B-",300);
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_81","2020-05-02","Blood","O+",390);
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_receive;
+------+---------------+---------------+-------------+-------------------+
| rid  | date_received | type_received | blood_group | quantity_received |
+------+---------------+---------------+-------------+-------------------+
| R_35 | 2019-07-20    | Platelets     | A-          |            465.00 |
| R_47 | 2022-07-19    | Blood         | AB+         |            470.00 |
| R_48 | 2018-10-04    | Blood         | O+          |            430.00 |
| R_72 | 2021-03-10    | Plasma        | B-          |            300.00 |
| R_81 | 2020-05-02    | Blood         | O+          |            390.00 |
+------+---------------+---------------+-------------+-------------------+
5 rows in set (0.001 sec)
```

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PAYMENT VALUES ("R_35","809276","UNION BANK","2019-07-20","62752161050",600);
Query OK, 1 row affected (0.005 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PAYMENT VALUES ("R_47","678756","KOTAK","2022-07-19","25117151590",700);
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PAYMENT VALUES ("R_48","421678","SBI","2018-10-04","31867857630",675);
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PAYMENT VALUES ("R_72","324304","ICICI","2021-03-10","36223120970",800);
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_PAYMENT VALUES ("R_81","977538","UION BANK","2020-05-02","67240893420",950);
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_payment;
+------+----------------+------------+------------+-------------+--------+
| rid  | transaction_id | bank       | date_trans | account_no  | amount |
+------+----------------+------------+------------+-------------+--------+
| R_35 |         809276 | UNION BANK | 2019-07-20 | 62752161050 | 600.00 |
| R_47 |         678756 | KOTAK      | 2022-07-19 | 25117151590 | 700.00 |
| R_48 |         421678 | SBI        | 2018-10-04 | 31867857630 | 675.00 |
| R_72 |         324304 | ICICI      | 2021-03-10 | 36223120970 | 800.00 |
| R_81 |         977538 | UION BANK  | 2020-05-02 | 67240893420 | 950.00 |
+------+----------------+------------+------------+-------------+--------+
5 rows in set (0.001 sec)
```

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DONATION VALUES ("D_35", "2020-04-17", "Blood",400, "O+", "P_48","E_18");
Query OK, 1 row affected (0.029 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DONATION VALUES ("D_47","2021-02-11","Plasma",470,"B-","P_32","E_18");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DONATION VALUES ("D_80","2021-07-26","Blood",320,"A+","P_74","E_99");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DONATION VALUES ("D_83","2019-08-05","Platelets",450,"AB-","P_20","E_98");
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DONATION VALUES ("D_90","2022-09-23","Blood",470,"B-","P_32","E_83");
Query OK, 1 row affected (0.027 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_donation;
+------+--------------+--------------+----------+-------------+------+------+
| did  | date_donated | type_donated | quantity | blood_group | pid  | eid  |
+------+--------------+--------------+----------+-------------+------+------+
| D_35 | 2020-04-17   | Blood        |   400.00 | O+          | P_48 | E_18 |
| D_47 | 2021-02-11   | Plasma       |   470.00 | B-          | P_32 | E_18 |
| D_80 | 2021-07-26   | Blood        |   320.00 | A+          | P_74 | E_99 |
| D_83 | 2019-08-05   | Platelets    |   450.00 | AB-         | P_20 | E_98 |
| D_90 | 2022-09-23   | Blood        |   470.00 | B-          | P_32 | E_83 |
+------+--------------+--------------+----------+-------------+------+------+
5 rows in set (0.001 sec)
```

Database to Manage Blood Donations

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVES VALUES ("R_35","P_48");
Query OK, 1 row affected (0.008 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVES VALUES ("R_47","P_09");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVES VALUES ("R_48","P_52");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVES VALUES ("R_72","P_13");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVES VALUES ("R_81","P_54");
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_receives;
+------+------+
| rid  | pid  |
+------+------+
| R_35 | P_48 |
| R_47 | P_09 |
| R_48 | P_52 |
| R_72 | P_13 |
| R_81 | P_54 |
+------+------+
5 rows in set (0.001 sec)
```

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DECREMENTS VALUES ("R_72", "S_02");
Query OK, 1 row affected (0.007 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_DECREMENTS VALUES ("R_81", "S_01");
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_decrements;
+------+------+
| rid  | sid  |
+------+------+
| R_72 | S_02 |
| R_81 | S_01 |
+------+------+
2 rows in set (0.000 sec)
```

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_INCREMENTS VALUES ("D_35","S_01");
Query OK, 1 row affected (0.006 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_INCREMENTS VALUES ("D_47","S_02");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_INCREMENTS VALUES ("D_80","S_03");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_INCREMENTS VALUES ("D_83","S_04");
Query OK, 1 row affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_INCREMENTS VALUES ("D_90","S_05");
Query OK, 1 row affected (0.003 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_increments;
+------+------+
| did  | sid  |
+------+------+
| D_35 | S_01 |
| D_47 | S_02 |
| D_80 | S_03 |
| D_83 | S_04 |
| D_90 | S_05 |
+------+------+
5 rows in set (0.000 sec)
```

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<div align="center">

Join Queries

</div>

1) Find all patients who have donated more than the average amount donated

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT 461_donation.pid, did, fname, lname, quantity
    -> FROM 461_DONATION join 461_PERSON on 461_donation.pid=461_person.pid
    -> WHERE 461_donation.quantity>(SELECT AVG(461_donation.quantity) FROM 461_donation);
+------+------+---------+----------+----------+
| pid  | did  | fname   | lname    | quantity |
+------+------+---------+----------+----------+
| P_32 | D_47 | Kelly   | Gorrick  |   470.00 |
| P_20 | D_83 | Jacques | Karlmann |   450.00 |
| P_32 | D_90 | Kelly   | Gorrick  |   470.00 |
+------+------+---------+----------+----------+
3 rows in set (0.001 sec)
```
Fig. 1

2) Retrieve all the persons' first name, last name, and address along with the type of donation and their blood group (left outer join)

```
MariaDB [pes1ug20cs461_blood_bank]>
MariaDB [pes1ug20cs461_blood_bank]> SELECT P.fname, P.lname, P.address, D.type_donated, D.blood_group
    -> FROM 461_Person as P LEFT OUTER JOIN 461_DONATION as D ON P.pid=D.pid;
+-----------+-----------+-------------------------+--------------+-------------+
| fname     | lname     | address                 | type_donated | blood_group |
+-----------+-----------+-------------------------+--------------+-------------+
| L;urette  | Skells    | Church Street, Bangalore | Blood       | O+          |
| Kelly     | Gorrick   | 7, Dhamaka street       | Plasma       | B-          |
| Wilburt   | Grinaway  | 14, Kailsh Marg         | Blood        | A+          |
| Jacques   | Karlmann  | JC Road                 | Platelets    | AB-         |
| Kelly     | Gorrick   | 7, Dhamaka street       | Blood        | B-          |
| Ravi      | Shankar   | M G Road                | NULL         | NULL        |
| Kareem    | Collet    | 56, Brigade Road        | NULL         | NULL        |
| Pebrook   | Kits      | 8, Clone Colony         | NULL         | NULL        |
| Dunn      | Mungin    | 3, Blue Avenue          | NULL         | NULL        |
| Philbert  | Nail      | Anna Sali               | NULL         | NULL        |
| Lynn      | Membry    | 1, Pink Street          | NULL         | NULL        |
| Hastings  | Arbon     | M G Road, Bangalore     | NULL         | NULL        |
| Alair     | O'Brien   | T Nagar                 | NULL         | NULL        |
| Simonette | Jellett   | Lavelle Road            | NULL         | NULL        |
| Reinald   | Cocks     | Mirza road              | NULL         | NULL        |
| Ravi      | Svanini   | 5, Lohia Garden         | NULL         | NULL        |
| Dickie    | MacPharlain| 6, Poes Garden         | NULL         | NULL        |
| Patrick   | Grogan    | American Street         | NULL         | NULL        |
| Winifred  | Elner     | 4, Banyan Avenie        | NULL         | NULL        |
| Rose      | Govey     | M G Road                | NULL         | NULL        |
| Lethia    | Beckley   | Bunder Road             | NULL         | NULL        |
+-----------+-----------+-------------------------+--------------+-------------+
21 rows in set (0.001 sec)
```
Fig. 2

3) Retrieve all the employee details who have taken donations (natural join)

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT E.eid, E.name, E.designation, E.date_of_joining, D.did
    -> FROM 461_EMPLOYEE as E join 461_DONATION as D ON E.eid=D.eid;
+------+--------+-------------+-----------------+------+
| eid  | name   | designation | date_of_joining | did  |
+------+--------+-------------+-----------------+------+
| E_18 | Kelwin | Sr Nurse    | 2018-01-02      | D_35 |
| E_18 | Kelwin | Sr Nurse    | 2018-01-02      | D_47 |
| E_83 | Stevy  | Jr Nurse    | 2020-11-15      | D_90 |
| E_98 | Bev    | Nurse       | 2019-04-28      | D_83 |
| E_99 | Gwenni | Nurse       | 2019-09-20      | D_80 |
+------+--------+-------------+-----------------+------+
5 rows in set (0.001 sec)
```
Fig. 3

4) Retrieve all the personal details (pid, fname, lname, sex, height, weight) along with their receiver id (rid) (right outer join)

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT 461_person.pid, rid, fname, lname, sex, height, `weight`
    -> FROM 461_BECOMES right outer join 461_PERSON on 461_PERSON.pid=461_BECOMES.pid;
+------+------+----------+-----------+-----+--------+--------+
| pid  | rid  | fname    | lname     | sex | height | weight |
+------+------+----------+-----------+-----+--------+--------+
| P_48 | R_35 | L;urette | Skells    | F   | 164.00 | 71.00  |
| P_09 | R_47 | Kareem   | Collet    | M   | 128.00 | 40.00  |
| P_52 | R_48 | Simonette| Jellett   | F   | 101.00 | 21.00  |
| P_13 | R_72 | Pebrook  | Kits      | M   | 139.00 | 62.00  |
| P_54 | R_81 | Reinald  | Cocks     | M   | 175.00 | 68.00  |
| P_02 | NULL | Ravi     | Shankar   | F   | 152.00 | 58.00  |
| P_15 | NULL | Dunn     | Mungin    | M   | 126.00 | 25.00  |
| P_20 | NULL | Jacques  | Karlmann  | M   | 162.00 | 72.00  |
| P_29 | NULL | Philbert | Nail      | F   | 167.00 | 74.00  |
| P_30 | NULL | Lynn     | Membry    | F   |  95.00 | 10.00  |
| P_32 | NULL | Kelly    | Gorrick   | M   | 163.00 | 59.00  |
| P_34 | NULL | Hastings | Arbon     | M   | 157.00 | 66.00  |
| P_41 | NULL | Alair    | O'Brien   | M   | 161.00 | 93.00  |
| P_57 | NULL | Ravi     | Svanini   | M   | 142.00 | 56.00  |
| P_66 | NULL | Dickie   | MacPharlain| M  | 174.00 | 63.00  |
| P_68 | NULL | Patrick  | Grogan    | M   | 178.00 | 77.00  |
| P_74 | NULL | Wilburt  | Grinaway  | M   | 159.00 | 69.00  |
| P_79 | NULL | Winifred | Elner     | F   | 165.00 | 80.00  |
| P_90 | NULL | Rose     | Govey     | F   | 144.00 | 48.00  |
| P_92 | NULL | Lethia   | Beckley   | F   | 123.00 | 22.00  |
+------+------+----------+-----------+-----+--------+--------+
20 rows in set (0.001 sec)
```

Fig. 4

Aggregate Functions

1) Display the eid, name and the number of times the donation was taken by the employee

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT D.eid, E.name, count(*) as number_of_donations_taken
    -> FROM 461_DONATION D,
    ->    461_EMPLOYEE E
    -> WHERE D.eid = E.eid
    -> GROUP BY (D.eid);
+------+--------+---------------------------+
| eid  | name   | number_of_donations_taken |
+------+--------+---------------------------+
| E_18 | Kelwin |                         2 |
| E_83 | Stevy  |                         1 |
| E_98 | Bev    |                         1 |
| E_99 | Gwenni |                         1 |
+------+--------+---------------------------+
4 rows in set (0.001 sec)
```
Fig. 1

2) Find and display the average amount donated

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT avg(quantity)
    -> FROM 461_DONATION D;
+---------------+
| avg(quantity) |
+---------------+
|    422.000000 |
+---------------+
1 row in set (0.000 sec)
```
Fig. 2

3) Find the maximum, minimum and average cost to receive a donation

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT max(amount) as Max_Cost, min(amount) as Min_Cost, avg(amount) as Average_Cost
    -> FROM 461_PAYMENT;
+----------+----------+--------------+
| Max_Cost | Min_Cost | Average_Cost |
+----------+----------+--------------+
|   950.00 |   600.00 |   745.000000 |
+----------+----------+--------------+
1 row in set (0.001 sec)
```

Fig. 3

4) Find the total amount of blood, platelets, or plasma available for each blood group

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT blood_group,sum(`left`)
    -> FROM 461_STOCK
    -> GROUP BY(blood_group);
+-------------+-------------+
| blood_group | sum(`left`) |
+-------------+-------------+
| A+          |      320.00 |
| AB-         |      450.00 |
| B-          |      640.00 |
| O+          |       10.00 |
+-------------+-------------+
4 rows in set (0.001 sec)
```
Fig. 4

Set Operations

1) Find the list of people (pid, fname, lname) who have donated or received blood

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT P.pid, P.fname, P.lname
    -> FROM 461_person P,
    ->     461_donation D
    -> WHERE P.pid = D.pid
    -> UNION
    -> SELECT P.pid, P.fname, P.lname
    -> FROM 461_person P,
    ->     461_becomes B
    -> WHERE P.pid = B.pid
    -> ;
+------+-----------+----------+
| pid  | fname     | lname    |
+------+-----------+----------+
| P_20 | Jacques   | Karlmann |
| P_32 | Kelly     | Gorrick  |
| P_48 | L;urette  | Skells   |
| P_74 | Wilburt   | Grinaway |
| P_09 | Kareem    | Collet   |
| P_13 | Pebrook   | Kits     |
| P_52 | Simonette | Jellett  |
| P_54 | Reinald   | Cocks    |
+------+-----------+----------+
8 rows in set (0.005 sec)
```
Fig. 1

2) Find the list of people (pid, fname, lname) who have donated as well as received blood

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT P1.pid, P1.fname, P1.lname
    -> FROM 461_person P1,
    ->     461_donation D
    -> WHERE P1.pid = D.pid and
    -> EXISTS (
    -> SELECT P2.pid, P2.fname, P2.lname
    -> FROM 461_person P2,
    ->     461_becomes B
    -> WHERE P2.pid = B.pid and P1.pid = P2.pid
    -> );
+------+----------+--------+
| pid  | fname    | lname  |
+------+----------+--------+
| P_48 | L;urette | Skells |
+------+----------+--------+
1 row in set (0.004 sec)
```
Fig. 2

3) Find the list of people (pid, fname, lname) who have donated blood but not received blood

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT P1.pid, P1.fname, P1.lname
    -> FROM 461_person P1,
    ->     461_donation D
    -> WHERE P1.pid = D.pid and
    -> NOT EXISTS (
    -> SELECT P2.pid, P2.fname, P2.lname
    -> FROM 461_person P2,
    ->     461_becomes B
    -> WHERE P2.pid = B.pid and P1.pid = P2.pid
    -> );
+------+---------+----------+
| pid  | fname   | lname    |
+------+---------+----------+
| P_20 | Jacques | Karlmann |
| P_32 | Kelly   | Gorrick  |
| P_32 | Kelly   | Gorrick  |
| P_74 | Wilburt | Grinaway |
+------+---------+----------+
4 rows in set (0.004 sec)
```
Fig. 3

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4) Find the list of people (pid, fname, lname) who neither donated nor received blood

```
MariaDB [pes1ug20cs461_blood_bank]> SELECT P1.pid, P1.fname, P1.lname
    -> FROM 461_person P1
    -> WHERE P1.pid not in (
    -> SELECT P.pid
    -> FROM 461_person P,
    ->     461_donation D
    -> WHERE P.pid = D.pid
    -> UNION
    -> SELECT P.pid
    -> FROM 461_person P,
    ->     461_becomes B
    -> WHERE P.pid = B.pid
    -> );
+------+----------+-------------+
| pid  | fname    | lname       |
+------+----------+-------------+
| P_02 | Ravi     | Shankar     |
| P_15 | Dunn     | Mungin      |
| P_29 | Philbert | Nail        |
| P_30 | Lynn     | Membry      |
| P_34 | Hastings | Arbon       |
| P_41 | Alair    | O'Brien     |
| P_57 | Ravi     | Svanini     |
| P_66 | Dickie   | MacPharlain |
| P_68 | Patrick  | Grogan      |
| P_79 | Winifred | Elner       |
| P_90 | Rose     | Govey       |
| P_92 | Lethia   | Beckley     |
+------+----------+-------------+
12 rows in set (0.002 sec)
```

Fig. 4

Function and Procedure

1) **Function:** Categorises the blood groups

Code:

```
MariaDB [pes1ug20cs461_blood_bank]> DELIMITER $$
MariaDB [pes1ug20cs461_blood_bank]> CREATE FUNCTION 461_donor_type(blood_group varchar(3))
    -> RETURNS varchar(150)
    -> DETERMINISTIC
    -> BEGIN
    -> DECLARE value varchar(150);
    -> IF blood_group like "O-" then
    -> SET value = "Universal Donor";
    -> END IF;
    -> IF blood_group like "AB+" then
    -> SET value = "Universal Receiver";
    -> END IF;
    -> IF blood_group like "O+" then
    -> SET value = "Donor for all Positive Blood Groups";
    -> ELSE
    -> SET value = "Rare Blood Group";
    -> END IF;
    -> RETURN value;
    -> END $$
Query OK, 0 rows affected (0.030 sec)
```
Fig. 1a

Output:

```
MariaDB [pes1ug20cs461_blood_bank]> WITH dude as
    -> (SELECT blood_group
    -> FROM 461_donation
    -> )
    -> SELECT blood_group,461_donor_type(blood_group) as Result FROM dude;
+-------------+-------------------------------------+
| blood_group | Result                              |
+-------------+-------------------------------------+
| O+          | Donor for all Positive Blood Groups |
| B-          | Rare Blood Group                    |
| O+          | Donor for all Positive Blood Groups |
| A+          | Rare Blood Group                    |
| AB-         | Rare Blood Group                    |
| B-          | Rare Blood Group                    |
+-------------+-------------------------------------+
6 rows in set (0.001 sec)
```
Fig. 1b

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2) **Function:** Prints whether people in the 461_PERSON table can donate blood based on age. To be able to donate age of the person must be greater than 18 and less than 65.

Code:

```
MariaDB [pes1ug20cs461_blood_bank]> DELIMITER $$
MariaDB [pes1ug20cs461_blood_bank]> CREATE FUNCTION 461_donate_age(dob date)
    -> RETURNS varchar(150)
    -> DETERMINISTIC
    -> BEGIN
    -> DECLARE value varchar(150);
    -> IF ((year(curdate()) - year(dob)) > 18 and (year(curdate()) - year(dob)) < 65) then
    -> SET value = "Based on their age person CAN donate blood";
    -> ELSE
    -> SET value = "Based on their age person CANNOT donate blood";
    -> END IF;
    -> RETURN value;
    -> END $$
Query OK, 0 rows affected (0.029 sec)
```

Fig. 2a

Output:

```
MariaDB [pes1ug20cs461_blood_bank]> WITH dude as
    -> (SELECT pid, dob
    -> FROM 461_person
    -> )
    -> SELECT pid, dob, 461_donate_age(dob) as Decision FROM dude;
+------+------------+------------------------------------------------+
| pid  | dob        | Decision                                       |
+------+------------+------------------------------------------------+
| P_02 | 2010-09-30 | Based on their age person CANNOT donate blood  |
| P_09 | 2010-07-23 | Based on their age person CANNOT donate blood  |
| P_13 | 2004-06-11 | Based on their age person CANNOT donate blood  |
| P_15 | 2015-05-24 | Based on their age person CANNOT donate blood  |
| P_20 | 1990-08-06 | Based on their age person CAN donate blood     |
| P_29 | 1996-09-23 | Based on their age person CAN donate blood     |
| P_30 | 2020-06-18 | Based on their age person CANNOT donate blood  |
| P_32 | 1998-11-18 | Based on their age person CAN donate blood     |
| P_34 | 1986-05-18 | Based on their age person CAN donate blood     |
| P_41 | 1987-01-25 | Based on their age person CAN donate blood     |
| P_48 | 1955-09-16 | Based on their age person CANNOT donate blood  |
| P_52 | 2019-06-01 | Based on their age person CANNOT donate blood  |
| P_54 | 1996-10-08 | Based on their age person CAN donate blood     |
| P_57 | 2005-05-12 | Based on their age person CANNOT donate blood  |
| P_66 | 2000-06-17 | Based on their age person CAN donate blood     |
| P_68 | 1970-12-31 | Based on their age person CAN donate blood     |
| P_74 | 1979-07-26 | Based on their age person CAN donate blood     |
| P_79 | 1968-07-10 | Based on their age person CAN donate blood     |
| P_90 | 2008-07-17 | Based on their age person CANNOT donate blood  |
| P_92 | 2018-04-21 | Based on their age person CANNOT donate blood  |
+------+------------+------------------------------------------------+
20 rows in set (0.002 sec)
```

Fig. 2b

3) **Procedure:** To update the amount donated for a given blood group.

Code:

```
MariaDB [pes1ug20cs461_blood_bank]> DELIMITER $$
MariaDB [pes1ug20cs461_blood_bank]> CREATE PROCEDURE 461_amt_chk(
    -> IN bg varchar(5),IN amt int, OUT msg varchar(50))
    -> BEGIN
    -> DECLARE `left` int;
    -> UPDATE 461_STOCK
    -> SET `left` = amt
    -> WHERE blood_group= bg;
    -> SET msg='Amount Updated';
    -> END;$$
Query OK, 0 rows affected (0.044 sec)

MariaDB [pes1ug20cs461_blood_bank]> DELIMITER ;
```
Fig. 3a

Output:

```
MariaDB [pes1ug20cs461_blood_bank]> CALL 461_amt_chk('O+',200,@A);
Query OK, 1 row affected (0.032 sec)

MariaDB [pes1ug20cs461_blood_bank]> SELECT @A;
+----------------+
| @A             |
+----------------+
| Amount Updated |
+----------------+
1 row in set (0.001 sec)

MariaDB [pes1ug20cs461_blood_bank]> SELECT * FROM 461_stock;
+------+-----------+-------------+--------+
| sid  | type      | blood_group | left   |
+------+-----------+-------------+--------+
| S_01 | Blood     | O+          | 200.00 |
| S_02 | Plasma    | B-          | 170.00 |
| S_03 | Blood     | A+          | 320.00 |
| S_04 | Platelets | AB-         | 450.00 |
+------+-----------+-------------+--------+
4 rows in set (0.001 sec)
```
Fig. 3b

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Triggers and Cursors

1) **Trigger:** To update the stock table based on the blood group and quantity when inserted into the donation table and receiver table

    a) **Increment stock on donation**

    Code:

Fig. 1a(i)

    Output:

Fig. 1a(ii)

Fig. 1a(iii)

b) Decrement stock on receiver entry

Code:

```
MariaDB [pes1ug20cs461_blood_bank]> DELIMITER $$
MariaDB [pes1ug20cs461_blood_bank]> CREATE TRIGGER 461_stock_update2
    -> AFTER INSERT
    -> ON 461_RECEIVE FOR EACH ROW
    -> BEGIN
    -> DECLARE error_msg VARCHAR(255);
    -> declare count int;
    -> SET error_msg = ('Required amount of blood is not available');
    -> IF (select `left` from 461_stock where blood_group = new.blood_group) < new.quantity_received THEN
    -> SIGNAL SQLSTATE '45000'
    -> SET MESSAGE_TEXT = error_msg;
    -> END IF;
    -> IF (select `left` from 461_stock where blood_group = new.blood_group) > new.quantity_received THEN
    -> UPDATE 461_STOCK
    -> SET `left` = `left` - new.quantity_received
    -> WHERE blood_group= new.blood_group;
    -> END IF;
    -> END $$
Query OK, 0 rows affected (0.008 sec)
```
Fig. 1b(i)

Output:

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_90","2022-11-02","Blood","O+",1200);
ERROR 1644 (45000): Required amount of blood is not available
MariaDB [pes1ug20cs461_blood_bank]> select * from 461_stock;
+------+----------+-------------+--------+
| sid  | type     | blood_group | left   |
+------+----------+-------------+--------+
| S_01 | Blood    | O+          | 600.00 |
| S_02 | Plasma   | B-          | 170.00 |
| S_03 | Blood    | A+          | 320.00 |
| S_04 | Platelets| AB-         | 450.00 |
+------+----------+-------------+--------+
4 rows in set (0.001 sec)
```
Fig. 1b(ii)

```
MariaDB [pes1ug20cs461_blood_bank]> INSERT INTO 461_RECEIVE VALUES ("R_90","2022-11-02","Blood","O+",390);
Query OK, 1 row affected (0.007 sec)

MariaDB [pes1ug20cs461_blood_bank]> select * from 461_stock;
+------+----------+-------------+--------+
| sid  | type     | blood_group | left   |
+------+----------+-------------+--------+
| S_01 | Blood    | O+          | 210.00 |
| S_02 | Plasma   | B-          | 170.00 |
| S_03 | Blood    | A+          | 320.00 |
| S_04 | Platelets| AB-         | 450.00 |
+------+----------+-------------+--------+
4 rows in set (0.001 sec)
```
Fig. 1b(iii)

2) **Cursor:** To calculate the number of donations for a patient

Code:

```
MariaDB [pes1ug20cs461_blood_bank]> DELIMITER $$
MariaDB [pes1ug20cs461_blood_bank]> CREATE PROCEDURE 461_donation_cnt(IN pid char(5), OUT count int)
    -> BEGIN
    -> DECLARE done INT DEFAULT FALSE;
    -> DECLARE cur1 CURSOR FOR SELECT count(*) FROM 461_DONATION where 461_DONATION.pid=pid;
    -> DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;
    -> OPEN cur1;
    -> read_loop: LOOP
    -> FETCH cur1 INTO count;
    -> IF done THEN
    -> LEAVE read_loop;
    -> END IF;
    -> END LOOP;
    -> CLOSE cur1;
    -> END $$
Query OK, 0 rows affected (0.033 sec)
```
Fig. 2a

Output:

```
MariaDB [pes1ug20cs461_blood_bank]> CALL 461_donation_cnt('P_32',@A);
Query OK, 0 rows affected (0.002 sec)

MariaDB [pes1ug20cs461_blood_bank]> SELECT @A;
+------+
| @A   |
+------+
|    2 |
+------+
1 row in set (0.000 sec)
```
Fig. 2b

Developing a Frontend

1) Opening Window
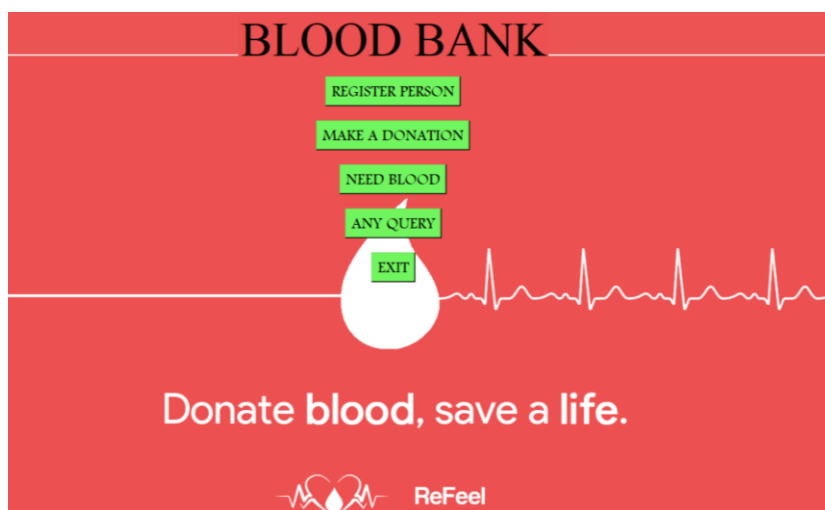
Fig. 1

2) Window to Insert, Delete, Update 461_Person Table

Fig. 2

3) Window to Insert, Delete, Update 461_Donation Table

Fig. 3

4) Window to Insert, Delete, Update 461_Receive Table

Fig. 4

5) Window to display the result of any query

Fig. 5