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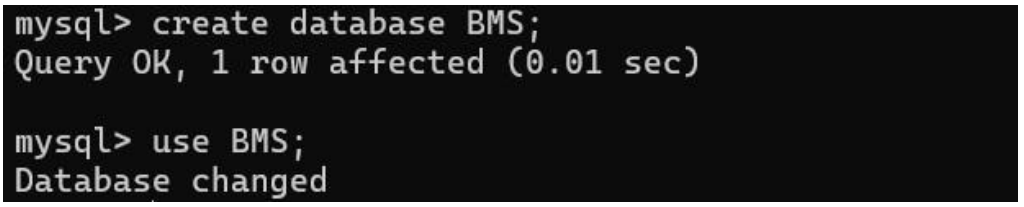
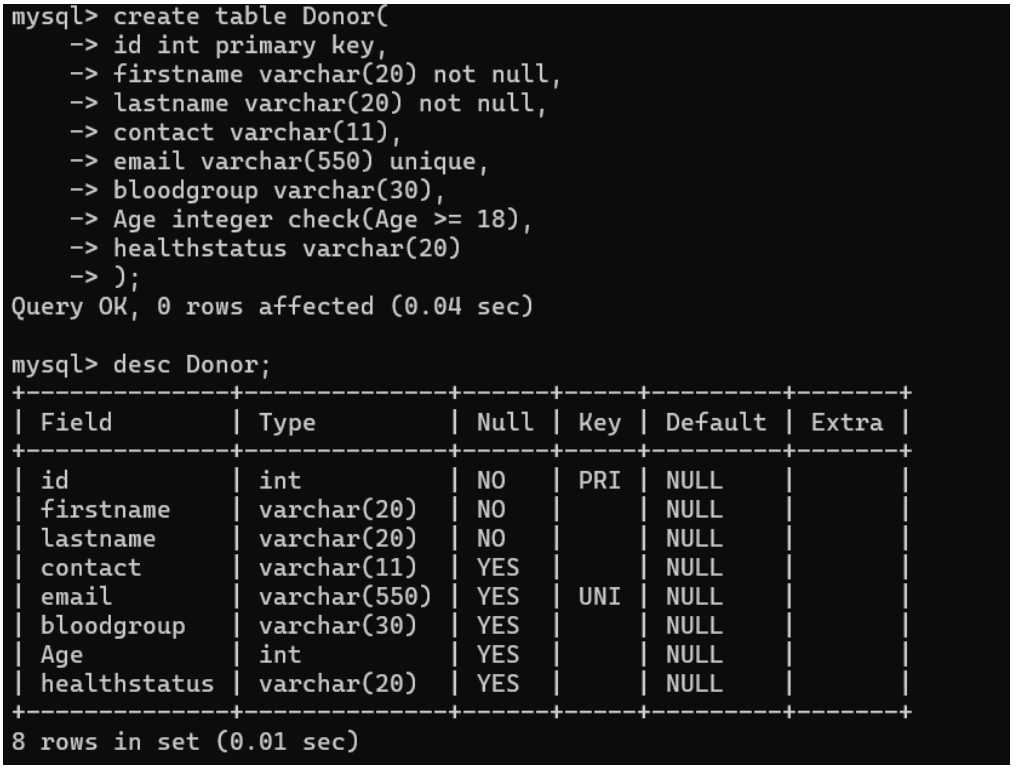
Experiment No.	**2**
Aim	**To understand DDL and DML commands in MySql.**
Problem Statement	Write **DDL commands** to create a table with **primary key, foreign key,** and **check constraints,** and demonstrate altering the table to **add, modify, or drop** a column. Use **DML commands** to **insert** values into the table, **update** specific records, and **delete** records.
DDL Command	 Database created with the name BMS and use command is used with database name to perform operations on the database.  The Donor table is created with a primary key, unique email, and not null constraints on `firstName` and `lastName`. It includes a check constraint on `Age` (must be ≥ 18) and stores other details like contact, blood group, and health status.

```
mysql> create table Blood(
    -> id int primary key,
    -> bloodgroup varchar(20) not null,
    -> quantity integer,
    -> expiry_date date,
    -> bloodStatus varchar(10)
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> desc Blood;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| id          | int         | NO   | PRI | NULL    |       |
| bloodgroup  | varchar(20) | NO   |     | NULL    |       |
| quantity    | int         | YES  |     | NULL    |       |
| expiry_date | date        | YES  |     | NULL    |       |
| bloodStatus | varchar(10) | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

The **Blood** table is created to store information about blood units. It includes attributes such as id (the primary key), bloodgroup, quantity, expiry_date, and bloodStatus. This table helps manage the inventory of blood units and track their availability and condition.

```
mysql> create table Donne(
    -> id int primary key,
    -> firstname varchar(10) not null,
    -> lastname varchar(10) not null,
    -> contact varchar(20),
    -> email varchar(30) unique,
    -> bloodgroup varchar(10),
    -> healthstatus varchar(15),
    -> request_id varchar(10),
    -> request_date date
    -> );
Query OK, 0 rows affected (0.03 sec)

mysql> desc donne;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| id           | int         | NO   | PRI | NULL    |       |
| firstname    | varchar(10) | NO   |     | NULL    |       |
| lastname     | varchar(10) | NO   |     | NULL    |       |
| contact      | varchar(20) | YES  |     | NULL    |       |
| email        | varchar(30) | YES  | UNI | NULL    |       |
| bloodgroup   | varchar(10) | YES  |     | NULL    |       |
| healthstatus | varchar(15) | YES  |     | NULL    |       |
| request_id   | varchar(10) | YES  |     | NULL    |       |
| request_date | date        | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

The **Donne** table is designed to hold details about donors. It consists of attributes including id (the primary key), firstName, lastName, contact, email (which is unique), bloodgroup, request_id, request date and healthstatus. This structure ensures that each donor's information is recorded accurately for future reference.

```
mysql> CREATE TABLE Blood_Donation (
    ->     id INT PRIMARY KEY,
    ->     donar_id INT(20),
    ->     blood_id INT(20),
    ->     donee_id INT(20),
    ->     donation_date DATE,
    ->     receive_date DATE,
    ->     FOREIGN KEY (donar_id) REFERENCES Donor(id),
    ->     FOREIGN KEY (blood_id) REFERENCES Blood(id),
    ->     FOREIGN KEY (donee_id) REFERENCES Donne(id)
    -> );
Query OK, 0 rows affected, 3 warnings (0.04 sec)

mysql> desc Blood_Donation;
+---------------+------+------+-----+---------+-------+
| Field         | Type | Null | Key | Default | Extra |
+---------------+------+------+-----+---------+-------+
| id            | int  | NO   | PRI | NULL    |       |
| donar_id      | int  | YES  | MUL | NULL    |       |
| blood_id      | int  | YES  | MUL | NULL    |       |
| donee_id      | int  | YES  | MUL | NULL    |       |
| donation_date | date | YES  |     | NULL    |       |
| receive_date  | date | YES  |     | NULL    |       |
+---------------+------+------+-----+---------+-------+
6 rows in set (0.00 sec)
```

The **Blood_Donation** table serves to link donations to their respective donors and blood units. It contains foreign keys referencing the id from the **Donor** table, id from the **Blood** table, and id from the **Donne** table, along with a donation_date. This table maintains the relationships between donors and the blood they donate, facilitating effective tracking of donation events.

Alter Command:

```
mysql> alter table Donor
    -> add Column gender varchar(15);
Query OK, 0 rows affected (0.04 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Donor;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| id           | int          | NO   | PRI | NULL    |       |
| firstname    | varchar(20)  | NO   |     | NULL    |       |
| lastname     | varchar(20)  | NO   |     | NULL    |       |
| contact      | varchar(11)  | YES  |     | NULL    |       |
| email        | varchar(550) | YES  | UNI | NULL    |       |
| bloodgroup   | varchar(30)  | YES  |     | NULL    |       |
| Age          | int          | YES  |     | NULL    |       |
| healthstatus | varchar(20)  | YES  |     | NULL    |       |
| gender       | varchar(15)  | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

The command adds a new column named **gender** of type **varchar(15)** to the existing **Donor** table, allowing the storage of gender information for each donor.

```
mysql> alter table Donor
    -> modify column gender varchar(15) not null;
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Donor;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| id           | int          | NO   | PRI | NULL    |       |
| firstname    | varchar(20)  | NO   |     | NULL    |       |
| lastname     | varchar(20)  | NO   |     | NULL    |       |
| contact      | varchar(11)  | YES  |     | NULL    |       |
| email        | varchar(550) | YES  | UNI | NULL    |       |
| bloodgroup   | varchar(30)  | YES  |     | NULL    |       |
| Age          | int          | YES  |     | NULL    |       |
| healthstatus | varchar(20)  | YES  |     | NULL    |       |
| gender       | varchar(15)  | NO   |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

The gender column is modified with not null so it will not accept null values for further insert operation.

```
mysql> alter table Donor
    -> drop column gender;
Query OK, 0 rows affected (0.03 sec)
Records: 0  Duplicates: 0  Warnings: 0

mysql> desc Donor;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| id           | int          | NO   | PRI | NULL    |       |
| firstname    | varchar(20)  | NO   |     | NULL    |       |
| lastname     | varchar(20)  | NO   |     | NULL    |       |
| contact      | varchar(11)  | YES  |     | NULL    |       |
| email        | varchar(550) | YES  | UNI | NULL    |       |
| bloodgroup   | varchar(30)  | YES  |     | NULL    |       |
| Age          | int          | YES  |     | NULL    |       |
| healthstatus | varchar(20)  | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
8 rows in set (0.00 sec)
```

Gender column is dropped using alter command.

```
mysql> truncate table bloodManager;
Query OK, 0 rows affected (0.04 sec)
```

Truncate command used.

```
mysql> drop table bloodManager;
Query OK, 0 rows affected (0.02 sec)
```

Drop Command used.

DML Command

```
mysql> INSERT INTO Donor(id, firstname, lastname, contact, email, bloodgroup, Age, healthstatus)
    -> VALUES
    -> (101, 'Sujal', 'Dingankar', '7798802841', 'sujal.dingankar@spit.ac.in', 'O+', 20, 'Healthy'),
    -> (102, 'Shreeya', 'Nemade', '7698231082', 'shreeya.nemade@spit.ac.in', 'A+', 19, 'Healthy'),
    -> (103, 'Harsha', 'Surwase', '5612798561', 'harsha.surwase@spit.ac.in', 'B+', 19, 'Healthy'),
    -> (104, 'Avinash', 'Patil', '1234598745', 'avinash.patil@spit.ac.in', 'AB+', 20, 'Healthy'),
    -> (105, 'Shruti', 'Bhuvad', '455612345', 'shruti.bhuvad@spit.ac.in', 'A+', 21, 'Healthy');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql> select * from Donor;
+-----+----------+----------+-----------+--------------------------+-----------+------+-------------+
| id  | firstname | lastname | contact   | email                    | bloodgroup | Age  | healthstatus |
+-----+----------+----------+-----------+--------------------------+-----------+------+-------------+
| 101 | Sujal    | Dingankar | 7798802841 | sujal.dingankar@spit.ac.in | O+        |   20 | Healthy     |
| 102 | Shreeya  | Nemade    | 7698231082 | shreeya.nemade@spit.ac.in  | A+        |   19 | Healthy     |
| 103 | Harsha   | Surwase   | 5612798561 | harsha.surwase@spit.ac.in  | B+        |   19 | Healthy     |
| 104 | Avinash  | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+       |   20 | Healthy     |
| 105 | Shruti   | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+        |   21 | Healthy     |
+-----+----------+----------+-----------+--------------------------+-----------+------+-------------+
5 rows in set (0.00 sec)
```

This INSERT command adds five records to the Donor table, each representing a unique donor with attributes such as ID, first name, last name, contact number, email address, blood group, age and health status, all adhering to the specified data types and constraints.

```
mysql> Insert into Blood(id, bloodgroup, quantity, expiry_date, bloodstatus) Values
    -> (101,'A+',50,'2024-10-13','Available'),
    -> (102,'B+',100,'2024-10-09','Available'),
    -> (103,'AB+',150,'2024-10-15','Expired'),
    -> (104,'O+',170,'2024-10-20','Available'),
    -> (105,'A+',60,'2024-10-14','Available');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql> select * from Blood;
+-----+------------+----------+-------------+-------------+
| id  | bloodgroup | quantity | expiry_date | bloodStatus |
+-----+------------+----------+-------------+-------------+
| 101 | A+         |       50 | 2024-10-13  | Available   |
| 102 | B+         |      100 | 2024-10-09  | Available   |
| 103 | AB+        |      150 | 2024-10-15  | Expired     |
| 104 | O+         |      170 | 2024-10-20  | Available   |
| 105 | A+         |       60 | 2024-10-14  | Available   |
+-----+------------+----------+-------------+-------------+
5 rows in set (0.00 sec)
```

This INSERT command adds five records to the Blood table, detailing various blood units with attributes including ID, blood group, quantity, expiry date, and availability status.

```
mysql> Insert into Donne(id, firstname,lastname, contact, email, bloodgroup, healthstatus, request_id, request_date)
    -> Values
    -> (101,'Shubham','Bhuvad','7798521123','shubham.bhuvad@spit.ac.in','A+','Healthy','R001','2024-10-05'),
    -> (102,'Sanjay','Kadam','4568912345','sanjay.bhuvad@spit.ac.in','AB+','Healthy','R002','2024-10-06'),
    -> (103,'Harshvardan','Nemade','7778894561','harshavardan.nemade@spit.ac.in','O+','Healthy','R003','2024-10-14'),
    -> (104,'Soham','Bhojane','564781234','soham.bhojane@spit.ac.in','A+','Healthy','R004','2024-10-20'),
    -> (105,'Pratiksha','Kunke','8895421463','pratiksha.kunke@spit.ac.in','B+','Healthy','R005','2024-10-18');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql> select * from Donne;
+-----+------------+----------+------------+-----------------------------+-----------+-------------+-----------+--------------+
| id  | firstname  | lastname | contact    | email                       | bloodgroup | healthstatus | request_id | request_date |
+-----+------------+----------+------------+-----------------------------+-----------+-------------+-----------+--------------+
| 101 | Shubham    | Bhuvad   | 7798521123 | shubham.bhuvad@spit.ac.in   | A+        | Healthy     | R001      | 2024-10-05   |
| 102 | Sanjay     | Kadam    | 4568912345 | sanjay.bhuvad@spit.ac.in    | AB+       | Healthy     | R002      | 2024-10-06   |
| 103 | Harshvardan | Nemade  | 7778894561 | harshavardan.nemade@spit.ac.in | O+     | Healthy     | R003      | 2024-10-14   |
| 104 | Soham      | Bhojane  | 564781234  | soham.bhojane@spit.ac.in    | A+        | Healthy     | R004      | 2024-10-20   |
| 105 | Pratiksha  | Kunke    | 8895421463 | pratiksha.kunke@spit.ac.in  | B+        | Healthy     | R005      | 2024-10-18   |
+-----+------------+----------+------------+-----------------------------+-----------+-------------+-----------+--------------+
5 rows in set (0.00 sec)
```

This **INSERT** command adds five records to the **Donne** table, capturing essential details for each individual, including ID, first name, last name, contact number, email address, blood group, and health status.

```
mysql> Insert into blood_donation(id,donar_id, blood_id, donee_id, donation_date, receive_date)
    -> Values
    -> (01,101,101,101,'2024-10-01','2024-10-05'),
    -> (02,102,102,NULL,'2024-10-15',NULL),
    -> (03,103,103,NULL,'2024-10-20',NULL),
    -> (04,104,104,104,'2024-10-16','2024-10-12'),
    -> (05,105,105,105,'2024-10-24','2024-10-25');
Query OK, 5 rows affected (0.01 sec)
Records: 5  Duplicates: 0  Warnings: 0

mysql> select * from blood_donation;
+----+----------+----------+----------+---------------+--------------+
| id | donar_id | blood_id | donee_id | donation_date | receive_date |
+----+----------+----------+----------+---------------+--------------+
|  1 |      101 |      101 |      101 | 2024-10-01    | 2024-10-05   |
|  2 |      102 |      102 |     NULL | 2024-10-15    | NULL         |
|  3 |      103 |      103 |     NULL | 2024-10-20    | NULL         |
|  4 |      104 |      104 |      104 | 2024-10-16    | 2024-10-12   |
|  5 |      105 |      105 |      105 | 2024-10-24    | 2024-10-25   |
+----+----------+----------+----------+---------------+--------------+
5 rows in set (0.00 sec)
```

This **INSERT** command adds five records to the **Blood_Donation** table, documenting donation events with details including the donation ID, donor ID, blood ID, individual ID, and the date of donation.

```
mysql> Select * from Donor;
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| id  | firstname | lastname  | contact    | email                     | bloodgroup | Age  | healthstatus |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| 101 | Sujal     | Dingankar | 7798802841 | sujal.dingankar@spit.ac.in | O+         |   20 | Healthy      |
| 102 | Shreeya   | Nemade    | 7698231082 | shreeya.nemade@spit.ac.in  | A+         |   19 | Healthy      |
| 103 | Harsha    | Surwase   | 5612798561 | harsha.surwase@spit.ac.in  | B+         |   19 | Healthy      |
| 104 | Avinash   | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+        |   20 | Healthy      |
| 105 | Shruti    | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+         |   21 | Healthy      |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
5 rows in set (0.00 sec)

mysql> update Donor set firstname = "Avi" where id = 104;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> Select * from Donor;
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| id  | firstname | lastname  | contact    | email                     | bloodgroup | Age  | healthstatus |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| 101 | Sujal     | Dingankar | 7798802841 | sujal.dingankar@spit.ac.in | O+         |   20 | Healthy      |
| 102 | Shreeya   | Nemade    | 7698231082 | shreeya.nemade@spit.ac.in  | A+         |   19 | Healthy      |
| 103 | Harsha    | Surwase   | 5612798561 | harsha.surwase@spit.ac.in  | B+         |   19 | Healthy      |
| 104 | Avi       | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+        |   20 | Healthy      |
| 105 | Shruti    | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+         |   21 | Healthy      |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
5 rows in set (0.00 sec)
```

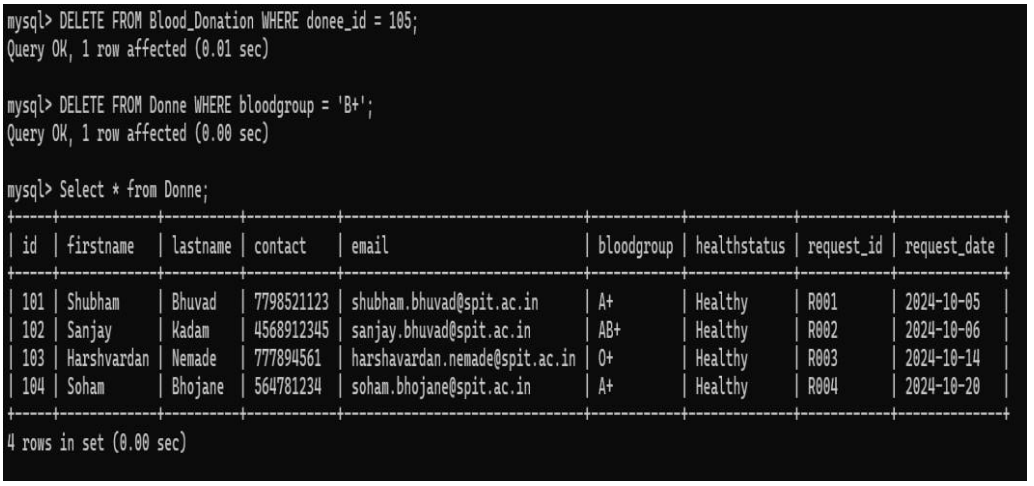
This **UPDATE** command modifies the **firstName** of the donor with ID **104**, changing it to "Avi" in the **Donor** table.

```
mysql> Select * from Donor;
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| id  | firstname | lastname  | contact    | email                     | bloodgroup | Age  | healthstatus |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| 101 | Sujal     | Dingankar | 7798802841 | sujal.dingankar@spit.ac.in | O+         |   20 | Healthy      |
| 102 | Shreeya   | Nemade    | 7698231082 | shreeya.nemade@spit.ac.in  | A+         |   19 | Healthy      |
| 103 | Harsha    | Surwase   | 5612798561 | harsha.surwase@spit.ac.in  | B+         |   19 | Healthy      |
| 104 | Avi       | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+        |   20 | Healthy      |
| 105 | Shruti    | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+         |   21 | Healthy      |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
5 rows in set (0.00 sec)

mysql> update Donor
    -> set age = 20
    -> where email like'%spit.ac.in';
Query OK, 3 rows affected (0.01 sec)
Rows matched: 5  Changed: 3  Warnings: 0

mysql> Select * from Donor;
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| id  | firstname | lastname  | contact    | email                     | bloodgroup | Age  | healthstatus |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
| 101 | Sujal     | Dingankar | 7798802841 | sujal.dingankar@spit.ac.in | O+         |   20 | Healthy      |
| 102 | Shreeya   | Nemade    | 7698231082 | shreeya.nemade@spit.ac.in  | A+         |   20 | Healthy      |
| 103 | Harsha    | Surwase   | 5612798561 | harsha.surwase@spit.ac.in  | B+         |   20 | Healthy      |
| 104 | Avi       | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+        |   20 | Healthy      |
| 105 | Shruti    | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+         |   20 | Healthy      |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
5 rows in set (0.00 sec)
```

This **UPDATE** command sets the **age** to **20** for all donors in the **Donor** table whose email addresses end with **@spit.ac.in**.

	 This **DELETE** command removes all records from the **Donne** table where the **bloodgroup** is **'B+'**.
Conclusion	From this experiment, I learned how to use different DDL and DML commands in MySQL to create and manage database structures and manipulate data. This experience improved my skills in organizing and handling information effectively within a database.