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Experiment No.	**5**
Aim	**Set operations and date time commands.**
Problem Statement	Set operations Union, intersect/intersection, except, rename using as, set division. The requirement for basic set operation is that the relation should have same arity and taken from same domain.
Commands	Donor Table. Donne Table. Blood Table. Blood_Donation 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+         |   21 | Healthy      |
| 104 | Avi       | Patil     | 1234598745 | avinash.patil@spit.ac.in   | AB+        |   18 | Healthy      |
| 105 | Shruti    | Bhuvad    | 455612345  | shruti.bhuvad@spit.ac.in   | A+         |   22 | Healthy      |
| 106 | John      | Doe       | 7894561230 | john.doe@example.com       | O+         |   25 | Healthy      |
| 107 | Jane      | Smith     | 7894567890 | jane.smith@example.com     | O+         |   30 | Healthy      |
| 108 | Mark      | Taylor    | 7894563456 | mark.taylor@example.com    | O+         |   19 | Healthy      |
| 109 | Lucy      | Brown     | 7894569876 | lucy.brown@example.com     | A+         |   35 | Healthy      |
+-----+-----------+-----------+------------+---------------------------+------------+------+--------------+
9 rows in set (0.00 sec)
```

```
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   | 777894561  | 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 | Shruti      | Bhuvad   | 7798802841 | sujal.dingankar@spit.ac.in  | O+         | Healthy      | R005       | 2024-10-25   |
+-----+-------------+----------+------------+-----------------------------+------------+--------------+------------+--------------+
5 rows in set (0.00 sec)
```

```
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)
```

```
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   |
+----+----------+----------+----------+---------------+--------------+
4 rows in set (0.00 sec)
```

Union:

```
mysql> Select id, firstname, lastname from Donor
    -> UNION
    -> Select id, firstname, lastname from Donne;
+-----+-------------+-----------+
| id  | firstname   | lastname  |
+-----+-------------+-----------+
| 101 | Sujal       | Dingankar |
| 102 | Shreeya     | Nemade    |
| 103 | Harsha      | Surwase   |
| 104 | Avi         | Patil     |
| 105 | Shruti      | Bhuvad    |
| 106 | John        | Doe       |
| 107 | Jane        | Smith     |
| 108 | Mark        | Taylor    |
| 109 | Lucy        | Brown     |
| 101 | Shubham     | Bhuvad    |
| 102 | Sanjay      | Kadam     |
| 103 | Harshvardan | Nemade    |
| 104 | Soham       | Bhojane   |
+-----+-------------+-----------+
13 rows in set (0.00 sec)
```

This query combines the `id`, `firstName`, and `lastName` from the `Donor` table and the `id`, `firstName`, and `lastName` from the `Donne` table into a single result set using `UNION`, eliminating duplicates.

Except/ Minus:

```
mysql> Select id, firstname, lastname from Donor
    -> Except
    -> Select id, firstname, lastname from Donne;
+-----+-----------+-----------+
| id  | firstname | lastname  |
+-----+-----------+-----------+
| 101 | Sujal     | Dingankar |
| 102 | Shreeya   | Nemade    |
| 103 | Harsha    | Surwase   |
| 104 | Avi       | Patil     |
| 105 | Shruti    | Bhuvad    |
| 106 | John      | Doe       |
| 107 | Jane      | Smith     |
| 108 | Mark      | Taylor    |
| 109 | Lucy      | Brown     |
+-----+-----------+-----------+
9 rows in set (0.00 sec)
```

This query retrieves all records from the `Donor` table that are not present in the `Donne` table, based on the matching columns `id`, `firstName`, and `lastName`, using the `EXCEPT` operation.

Intersect:

```
mysql> Select id, firstname, lastname from Donor
    -> INTERSECT
    -> Select id, firstname, lastname from Donne;
+-----+-----------+----------+
| id  | firstname | lastname |
+-----+-----------+----------+
| 105 | Shruti    | Bhuvad   |
+-----+-----------+----------+
1 row in set (0.00 sec)
```

This query retrieves the common id and firstName, lastName pairs from the Donor and Donne tables, returning records that exist in both tables.

Set Division and Rename using As:

```
mysql> SELECT
    ->     D.id AS donor_id,
    ->     D.firstname AS first_name,
    ->     D.lastname AS last_name,
    ->     COUNT(B.id) AS total_donations
    -> FROM
    ->     Donor D
    -> LEFT JOIN
    ->     blood_donation B ON D.id = B.donar_id
    -> GROUP BY
    ->     D.id, D.firstname, D.lastname;
+----------+------------+-----------+-----------------+
| donor_id | first_name | last_name | total_donations |
+----------+------------+-----------+-----------------+
|      101 | Sujal      | Dingankar |               1 |
|      102 | Shreeya    | Nemade    |               1 |
|      103 | Harsha     | Surwase   |               1 |
|      104 | Avi        | Patil     |               1 |
|      105 | Shruti     | Bhuvad    |               0 |
|      106 | John       | Doe       |               0 |
|      107 | Jane       | Smith     |               0 |
|      108 | Mark       | Taylor    |               0 |
|      109 | Lucy       | Brown     |               0 |
+----------+------------+-----------+-----------------+
9 rows in set (0.00 sec)
```

This query retrieves each donor's ID, first name, last name, and the number of donations they've made, ensuring the count matches the total donations recorded for that donor.

Date Functions in SQL:

```
mysql> Select * from Blood where expiry_date <= '2024-10-15';
+-----+------------+----------+-------------+-------------+
| 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     |
| 105 | A+         |       60 | 2024-10-14  | Available   |
+-----+------------+----------+-------------+-------------+
4 rows in set (0.00 sec)
```

This query retrieves expired blood units from the Blood table.

Conclusion	From this experiment, I learnt different set operations performed in SQL & also implemented them.