DBMS Lab 4

Aryansh Bhargavan

PES1UG20CS084

Task 1

1. Inserting shared data into tables:

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Compartment.csv"
    -> into table compartment
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 20 rows affected, 19 warnings (0.063 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "FareTable.csv"
    -> into table fare
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 9 rows affected, 8 warnings (0.020 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Payment-Info.csv"
    -> into table payment_info
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 15 rows affected (0.023 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "RouteInfo.csv"
    -> into table route_info
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 44 rows affected, 43 warnings (0.031 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Ticket.csv"
    -> into table ticket
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 13 rows affected (0.030 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Ticket-Passenger.csv"
    -> into table ticket_passenger
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 24 rows affected (0.062 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Train.csv"
    -> into table train
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 6 rows affected (0.022 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Train_User.csv"
    -> into table train_user
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 1 row affected, 1 warning (0.023 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "User-Phone.csv"
    -> into table user_phone
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 66 rows affected (0.030 sec)
```

```
MariaDB [pes1ug20cs084_railway_lab4]> load data infile "Train_User.csv"
    -> into table user_train
    -> columns terminated by ','
    -> optionally enclosed by '"'
    -> escaped by '"'
    -> lines terminated by '\n'
    -> ignore 1 lines;
Query OK, 33 rows affected, 98 warnings (0.067 sec)
```

2. Calculate and update age attribute in User Table

```
update train_user set age=timestampdiff(year,dob,curdate());
```

```
MariaDB [lab4_pes1ug20cs084]> select * from train_user;
+---------+-----------+------------+-----------+------+------------+---------+------------------------------+
| user_id | user_type | firstname  | lastname  | age  | dob        | pincode | street_number                |
+---------+-----------+------------+-----------+------+------------+---------+------------------------------+
| ADM_001 | ADMIN     | Narendra   | Modi      |   33 | 1989-04-14 | 600047  | Old Jail Road                |
| ADM_002 | ADMIN     | Droupadi   | Murmu     |   32 | 1990-04-14 | 640012  | High Street                  |
| ADM_003 | ADMIN     | Manmohan   | Singh     |   31 | 1991-04-08 | 575003  | Pumpwell Road                |
| USR_001 | PSGR      | Ajit       | Ullal     |   51 | 1971-01-01 | 560001  | 10, Janpath                  |
| USR_002 | PSGR      | Muhammed   | Ali       |   21 | 2000-10-09 | 560003  | 10, Downing                  |
| USR_003 | PSGR      | Sai Deepak | Reddy     |   25 | 1996-12-12 | 600001  | 14, Kailsh Marg              |
| USR_004 | PSGR      | Rudra      | Agarwal   |   25 | 1996-12-13 | 600042  | 5, Lohia Garden              |
| USR_005 | PSGR      | Rahul      | Khanna    |   24 | 1997-12-14 | 600067  | 1, Pink Street               |
| USR_006 | PSGR      | Nirmala    | Seturaman |   23 | 1998-12-15 | 560105  | 3, Blue Avenue               |
| USR_007 | PSGR      | Smriti     | Irani     |   22 | 1999-12-16 | 575014  | 4, Banyan Avenie             |
| USR_008 | PSGR      | Ajit       | Sethi     |   56 | 1966-04-14 | 575001  | 6, Poes Garden               |
| USR_009 | PSGR      | Arjun      | Allu      |   55 | 1967-04-08 | 575020  | 7, Dhamaka street            |
| USR_010 | PSGR      | Samanta    | Prabhu    |   54 | 1968-04-14 | 600042  | 8, Clone Colony              |
| USR_011 | PSGR      | Kiran      | Bedi      |   53 | 1969-04-14 | 560003  | 56, Brigade Road             |
| USR_012 | PSGR      | Rahul      | Gandhi    |   52 | 1970-04-08 | 475001  | Mirza road                   |
| USR_013 | PSGR      | Rashkit    | Shetty    |   51 | 1971-04-14 | 560009  | JC Road                      |
| USR_014 | PSGR      | Rishi      | Sunak     |   50 | 1972-04-14 | 600034  | Anna Sali                    |
| USR_015 | PSGR      | Vedavalli  | Srinath   |   49 | 1973-04-14 | 560054  | Church Street, Bangalore     |
| USR_016 | PSGR      | Subbu      | Saravana  |   48 | 1974-04-14 | 600043  | American Street              |
| USR_017 | PSGR      | Sheela     | Dixit     |   47 | 1975-04-08 | 560048  | Kasturba Road                |
| USR_018 | PSGR      | Margaret   | Alva      |   46 | 1976-04-14 | 560008  | New BEL Road                 |
| USR_019 | PSGR      | Arun       | Kumar     |   45 | 1977-04-14 | 600046  | Mint Street                  |
| USR_020 | PSGR      | Anshu      | Bhardwaj  |   44 | 1978-04-14 | 575001  | KSR Road                     |
| USR_021 | PSGR      | Suma       | Sampat    |   43 | 1979-04-08 | 560012  | Old Airport Road, Bangalore  |
| USR_022 | PSGR      | Srihari    | Udupa     |   42 | 1980-04-14 | 560015  | Suranjan Das Road            |
| USR_023 | PSGR      | Satish     | Kotian    |   41 | 1981-04-14 | 600044  | T Nagar                      |
| USR_024 | PSGR      | Shradha    | Nayar     |   40 | 1982-04-08 | 560006  | M G Road, Bangalore          |
| USR_025 | PSGR      | Manisha    | Solanki   |   39 | 1983-04-08 | 575030  | M G Road                     |
| USR_026 | PSGR      | Bharti     | Devgan    |   38 | 1984-04-14 | 560059  | NAL Wind Tunnel Road         |
| USR_027 | PSGR      | Roopa      | Ram       |   37 | 1985-04-14 | 575023  | Bunder Road                  |
| USR_028 | PSGR      | Pallavi    | Ram       |   36 | 1986-04-08 | 560044  | Lavelle Road                 |
| USR_029 | PSGR      | Ravi       | Naik      |   35 | 1987-04-14 | 600045  | Thiru V ka Salai             |
| USR_030 | PSGR      | Virat      | Murthy    |   34 | 1988-04-14 | 575011  | Bejai New Road               |
+---------+-----------+------------+-----------+------+------------+---------+------------------------------+
```

3. Display all the route information whose distance falls in a range from 70 to 150 km.

```
select * from route_info where distance between 70 and 150;
```

```
MariaDB [lab4_pes1ug20cs084]> select * from route_info where distance between 70 and 150;
+----------------+--------------+-------------------+----------------+----------+---------+
| from_station_no | to_station_no | from_station_name | to_station_name | distance | train_no |
+----------------+--------------+-------------------+----------------+----------+---------+
|             1 |            2 | Mangaluru         | Kannur          |      131 |    2526 |
|             4 |            4 | Palakkad          | Chennai         |      130 |    2526 |
|             1 |            2 | Chennai           | Palakkad        |      130 |    2526 |
|             3 |            4 | Kannur            | Mangaluru       |      131 |    2526 |
|             3 |            4 | Mysore            | Bengaluru       |      139 |    5845 |
|             1 |            2 | Bengaluru         | Mysore          |      139 |    5845 |
|             1 |            2 | Chennai           | Sholingur       |       90 |    6262 |
|             1 |            3 | Chennai           | Katpadi         |      129 |    6262 |
|             4 |            5 | Bangarpet         | Bengaluru       |       71 |    6262 |
|             1 |            2 | Bengaluru         | Bangarpet       |       71 |    6262 |
|             3 |            5 | Katpadi           | Chennai         |      130 |    6262 |
|             4 |            5 | Sholingur         | Chennai         |       90 |    6262 |
+----------------+--------------+-------------------+----------------+----------+---------+
```

4. Display the train route information which are run between Chennai and Sholingur

```
select * from route_info where from_station_name="Chennai" and
to_station_name="Sholingur";
```

```
MariaDB [lab4_pes1ug20cs084]> select * from route_info where from_station_name="Chennai" and to_station_name="Sholingur";
+----------------+--------------+------------------+----------------+----------+----------+
| from_station_no | to_station_no | from_station_name | to_station_name | distance | train_no |
+----------------+--------------+------------------+----------------+----------+----------+
|              1 |            2 | Chennai          | Sholingur      |       90 |    62620 |
+----------------+--------------+------------------+----------------+----------+----------+
1 row in set (0.009 sec)
```

5. Display the train details whose type is not mail

```
select * from train where train_type != "Mail";
```

```
MariaDB [lab4_pes1ug20cs084]> select * from train where train_type != "Mail";
+----------+----------------+------------+-----------+-------------+--------------+
| train_no | train_name     | train_type | source    | destination | availability |
+----------+----------------+------------+-----------+-------------+--------------+
|    58450 | MAN-BEN Express | Fast      | Mangaluru | Bengaluru   | yes          |
|    58451 | BEN-MAN Express | Fast      | Bengaluru | Mangaluru   | yes          |
|    62620 | CHE-BEN Shatabdi | Superfast | Chennai   | Bengaluru   | No           |
|    62621 | BEN-CHE Shatabdi | Superfast | Bengaluru | Chennai     | yes          |
+----------+----------------+------------+-----------+-------------+--------------+
4 rows in set (0.001 sec)
```

6. Display the train name which goes to Chennai from Bangalore

```
select train_name from train where source="Bengaluru" and
destination="Chennai";
```

```
MariaDB [lab4_pes1ug20cs084]> select train_name from train where source="Bengaluru" and destination="Chennai";
+------------------+
| train_name       |
+------------------+
| BEN-CHE Shatabdi |
+------------------+
1 row in set (0.001 sec)
```

7. Display the list of trains starting from Chennai after 8:00

```
select * from ticket where departure="Chennai" and
departure_time>cast('8:00:00' as time);
```

```
MariaDB [lab4_pes1ug20cs084]> select * from ticket where departure="Chennai" and departure_time>cast('8:00:00' as time);
+--------+----------+-------------+-----------+-----------+----------------+--------------+--------------+------------+------------------+----------------+
| pnr    | train_no | travel_date | departure | arrival   | departure_time | arrival_time | passenger_id | train_type | compartment_type | compartment_no |
+--------+----------+-------------+-----------+-----------+----------------+--------------+--------------+------------+------------------+----------------+
| PNR003 |    25261 | 2022-08-01  | Chennai   | Mangaluru | 18:00:00       | 07:30:00     | ADM_003      | Mail       | III Class        | G02            |
+--------+----------+-------------+-----------+-----------+----------------+--------------+--------------+------------+------------------+----------------+
1 row in set (0.010 sec)
```

8. Display the list of users who are born between 1980 to 1990

```
select * from train_user where dob between '1980-01-01' and '1990-12-31';
```

```
MariaDB [lab4_pes1ug20cs084]> select * from train_user where dob between '1980-01-01' and '1990-12-31';
+---------+-----------+-----------+----------+------+------------+---------+--------------------+
| user_id | user_type | firstname | lastname | age  | dob        | pincode | street_number      |
+---------+-----------+-----------+----------+------+------------+---------+--------------------+
| ADM_001 | ADMIN     | Narendra  | Modi     |   33 | 1989-04-14 | 600047  | Old Jail Road      |
| ADM_002 | ADMIN     | Droupadi  | Murmu    |   32 | 1990-04-14 | 640012  | High Street        |
| USR_022 | PSGR      | Srihari   | Udupa    |   42 | 1980-04-14 | 560015  | Suranjan Das Road  |
| USR_023 | PSGR      | Satish    | Kotian   |   41 | 1981-04-14 | 600044  | T Nagar            |
| USR_024 | PSGR      | Shradha   | Nayar    |   40 | 1982-04-08 | 560006  | M G Road, Bangalore |
| USR_025 | PSGR      | Manisha   | Solanki  |   39 | 1983-04-08 | 575030  | M G Road           |
| USR_026 | PSGR      | Bharti    | Devgan   |   38 | 1984-04-14 | 560059  | NAL Wind Tunnel Road |
| USR_027 | PSGR      | Roopa     | Ram      |   37 | 1985-04-14 | 575023  | Bunder Road        |
| USR_028 | PSGR      | Pallavi   | Ram      |   36 | 1986-04-08 | 560044  | Lavelle Road       |
| USR_029 | PSGR      | Ravi      | Naik     |   35 | 1987-04-14 | 600045  | Thiru V ka Salai   |
| USR_030 | PSGR      | Virat     | Murthy   |   34 | 1988-04-14 | 575011  | Bejai New Road     |
+---------+-----------+-----------+----------+------+------------+---------+--------------------+
11 rows in set (0.009 sec)
```

9. Display the train users whose name starts with the letter 'S'

```
select * from train_user where firstname like "S%";
```

```
MariaDB [lab4_pes1ug20cs084]> select * from train_user where firstname like "S%";
+----------+-----------+-------------+-----------+------+------------+----------+-------------------------------+
| user_id  | user_type | firstname   | lastname  | age  | dob        | pincode  | street_number                 |
+----------+-----------+-------------+-----------+------+------------+----------+-------------------------------+
| USR_003  | PSGR      | Sai Deepak  | Reddy     |  25  | 1996-12-12 | 600001   | 14, Kailsh Marg               |
| USR_007  | PSGR      | Smriti      | Irani     |  22  | 1999-12-16 | 575014   | 4, Banyan Avenie              |
| USR_010  | PSGR      | Samanta     | Prabhu    |  54  | 1968-04-14 | 600042   | 8, Clone Colony               |
| USR_016  | PSGR      | Subbu       | Saravana  |  48  | 1974-04-14 | 600043   | American Street               |
| USR_017  | PSGR      | Sheela      | Dixit     |  47  | 1975-04-08 | 560048   | Kasturba Road                 |
| USR_021  | PSGR      | Suma        | Sampat    |  43  | 1979-04-08 | 560012   | Old Airport Road, Bangalore   |
| USR_022  | PSGR      | Srihari     | Udupa     |  42  | 1980-04-14 | 560015   | Suranjan Das Road             |
| USR_023  | PSGR      | Satish      | Kotian    |  41  | 1981-04-14 | 600044   | T Nagar                       |
| USR_024  | PSGR      | Shradha     | Nayar     |  40  | 1982-04-08 | 560006   | M G Road, Bangalore           |
+----------+-----------+-------------+-----------+------+------------+----------+-------------------------------+
9 rows in set (0.001 sec)
```

10. Find the availability of I Class compartment of the train number 62621

```
select availability from compartment where compartment_type="I Class" and
train_number=62621;
```

```
MariaDB [lab4_pes1ug20cs084]> select availability from compartment where compartment_type="I Class" and train_number=62621;
+--------------+
| availability |
+--------------+
|            6 |
+--------------+
1 row in set (0.010 sec)
```

11. Find the PNR and Transaction ID of the users who made payment via Union Bank

```
select pnr, transaction_no from payment_info where bank="Union Bank";
```

```
MariaDB [lab4_pes1ug20cs084]> select pnr, transaction_no from payment_info where bank="Union Bank";
+--------+----------------+
| pnr    | transaction_no |
+--------+----------------+
| PNR012 |         243535 |
| PNR015 |         758900 |
| PNR010 |         867546 |
| PNR003 |         978776 |
+--------+----------------+
4 rows in set (0.007 sec)
```

Task 2

1. **Grant privileges on different tables to users and observe the effect.**

   1. First I create a new user:
   ```
   MariaDB [mysql]> create user pes1ug20cs084@localhost identified by 'password';
   Query OK, 0 rows affected (0.009 sec)
   ```

   2. I then grant `SELECT` to said user for table `train` in database `lab4_pes1ug20cs084`:
   ```
   MariaDB [mysql]> grant select on lab4_pes1ug20cs084.train to pes1ug20cs084@localhost;
   Query OK, 0 rows affected (0.093 sec)
   ```

   3. Now, I log in to mysql using account `pes1ug20cs084` and try accessing beyond my granted permissions:
   ```
    #  > 4ms > D:\SEM5\DBMS\PES1UG20CS084_Lab4  🔒 87 > ✔           Aryansh < 21:35:10 ⊙
    Λ  mysql -u pes1ug20cs084 -ppassword
   Welcome to the MariaDB monitor.  Commands end with ; or \g.
   Your MariaDB connection id is 12
   Server version: 10.4.24-MariaDB mariadb.org binary distribution

   Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

   Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

   MariaDB [(none)]> use lab4_pes1ug20cs084
   Database changed
   MariaDB [lab4_pes1ug20cs084]> select * from user_train;
   ERROR 1142 (42000): SELECT command denied to user 'pes1ug20cs084'@'localhost' for table 'use
   r_train'
   MariaDB [lab4_pes1ug20cs084]>
   ```

4. Now I try accessing what I have been granted access for:

```
MariaDB [lab4_pes1ug20cs084]> select * from train;
+----------+-----------------+------------+-----------+-------------+--------------+
| train_no | train_name      | train_type | source    | destination | availability |
+----------+-----------------+------------+-----------+-------------+--------------+
|    25260 | Chennai Mail    | Mail       | Mangaluru | Chennai     | Yes          |
|    25261 | Managaluru Mail | Mail       | Chennai   | Mangaluru   | Yes          |
|    58450 | MAN-BEN Express | Fast       | Mangaluru | Bengaluru   | yes          |
|    58451 | BEN-MAN Express | Fast       | Bengaluru | Mangaluru   | yes          |
|    62620 | CHE-BEN Shatabdi| Superfast  | Chennai   | Bengaluru   | No           |
|    62621 | BEN-CHE Shatabdi| Superfast  | Bengaluru | Chennai     | yes          |
+----------+-----------------+------------+-----------+-------------+--------------+
6 rows in set (0.001 sec)
```

2. **Revoke UPDATE & DELETE privileges on any tables and observe the effect if any deletion/updation is performed.**

   1. First I grant access to all commands to user `pes1ug20cs084` on table `train` on database `lab4_pes1ug20cs084`:

   ```
   MariaDB [mysql]> grant all on lab4_pes1ug20cs084.train to pes1ug20cs084@localhost;
   Query OK, 0 rows affected (0.017 sec)
   ```

   2. Then I revoke `update` and `delete` on table train:

   ```
   MariaDB [mysql]> revoke update, delete on lab4_pes1ug20cs084.train from pes1ug20cs084@localhost;
   Query OK, 0 rows affected (0.018 sec)
   ```

   3. Then I try using `update` and `delete` command on table `train` using user `pes1ug20cs084`:

   ```
   MariaDB [lab4_pes1ug20cs084]> delete from train where source="Chennai";
   ERROR 1142 (42000): DELETE command denied to user 'pes1ug20cs084'@'localhost' for table 'train'
   MariaDB [lab4_pes1ug20cs084]> update train set train_type="Superfast" where source="Chennai";
   ERROR 1142 (42000): UPDATE command denied to user 'pes1ug20cs084'@'localhost' for table 'train'
   MariaDB [lab4_pes1ug20cs084]>
   ```

3. **Create different save points and perform some insert/update/delete operations. Observe the**
   effect of commit & rollback operations and release any created savepoints.

   1. Creating savepoint 1:

   ```
   MariaDB [lab4_pes1ug20cs084]> savepoint sp1;
   Query OK, 0 rows affected (0.000 sec)
   ```

   2. I created another table which wasn't affected by foreign key contstraints to demonstrate this:

   ```
   MariaDB [lab4_pes1ug20cs084]> create table test(
       -> id int,
       -> name varchar(255));
   Query OK, 0 rows affected (0.037 sec)

   MariaDB [lab4_pes1ug20cs084]> insert into test values (1,'Aryansh'), (2,'Aryan'), (3,'Avanish');
   Query OK, 3 rows affected (0.014 sec)
   Records: 3  Duplicates: 0  Warnings: 0

   MariaDB [lab4_pes1ug20cs084]> select * from test;
   +------+---------+
   | id   | name    |
   +------+---------+
   |    1 | Aryansh |
   |    2 | Aryan   |
   |    3 | Avanish |
   +------+---------+
   3 rows in set (0.001 sec)
   ```

3. Deleting a value and showing table state:

```
MariaDB [lab4_pes1ug20cs084]> delete from test where id=3;
Query OK, 1 row affected (0.001 sec)

MariaDB [lab4_pes1ug20cs084]> select * from test;
+------+---------+
| id   | name    |
+------+---------+
|    1 | Aryansh |
|    2 | Aryan   |
+------+---------+
2 rows in set (0.001 sec)
```

4. Rolling back to previous state and showing values:

```
MariaDB [lab4_pes1ug20cs084]> rollback to sp1;
Query OK, 0 rows affected (0.001 sec)

MariaDB [lab4_pes1ug20cs084]> select* from test;
+------+---------+
| id   | name    |
+------+---------+
|    1 | Aryansh |
|    2 | Aryan   |
|    3 | Avanish |
+------+---------+
3 rows in set (0.001 sec)
```

We notice that previous value has been regained.