

DATABASE MANAGEMENT SYSTEM

LAB 4

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SECTION: K

DEPT: CSE

1. Loading Data into tables

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> 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 (0.006 sec)
Records: 6 Deleted: 0 Skipped: 0 Warnings: 0
MariaDB [cs667_rr]>
```

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> 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 (0.020 sec)
Records: 20 Deleted: 0 Skipped: 0 Warnings: 19
MariaDB [cs667_rr]> _
```

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> 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 (0.016 sec)
Records: 44 Deleted: 0 Skipped: 0 Warnings: 43
MariaDB [cs667_rr]> _
```

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> load data infile "Train_User.csv" into table user columns terminated by ',' optionally enclosed by '"' escaped by '"' lines terminated by '\r\n' ignore 1 lines;
Query OK, 33 rows affected (0.012 sec)
Records: 33 Deleted: 0 Skipped: 0 Warnings: 0
MariaDB [cs667_rr]> _
```

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> 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, 65 warnings (0.025 sec)
Records: 66 Deleted: 0 Skipped: 0 Warnings: 65
MariaDB [cs667_rr]> _
```

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> 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, 13 warnings (0.016 sec)
Records: 13 Deleted: 0 Skipped: 0 Warnings: 13

MariaDB [cs667_rr]>
```

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> 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, 65 warnings (0.017 sec)
Records: 66 Deleted: 0 Skipped: 0 Warnings: 65

MariaDB [cs667_rr]>
```

```
Select C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> load data infile "FareTable.csv" into table fare_table columns terminated by ',' optionally enclosed by '"' escaped by '"'
lines terminated by '\n' ignore 1 lines;
Query OK, 9 rows affected, 8 warnings (0.009 sec)
Records: 9 Deleted: 0 Skipped: 0 Warnings: 8
```

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> load data infile "Ticket-Passenger.csv" into table ticket_passenger columns terminated by ',' optionally encl
osed by '"' escaped by '"' lines terminated by '\n' ignore 1 lines;
Query OK, 21 rows affected (0.015 sec)
Records: 21 Deleted: 0 Skipped: 0 Warnings: 0

MariaDB [cs667_rr]>
```

Using insert command:

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> insert payment_info values
-> (342344,"IOB",5.62357E+15,NULL,"PNR001"),
-> (676756,"CANARA BANK",7.36756E+15,NULL,"PNR002"),
-> (978776,"UNION BANK",154978597435874,NULL,"PNR003"),
-> (531343,"SBI",8.95327E+15,NULL,"PNR004"),
-> (978098,"INDIAN BANK",9.88733E+15,NULL,"PNR005"),
-> (146445,"HDFC",1.23433E+15,NULL,"PNR006"),
-> (576768,"ICICI",7.56356E+15,NULL,"PNR007"),
-> (746745,"KOTAK",2.54564E+15,NULL,"PNR008"),
-> (867546,"UNION BANK",4.65769E+15,NULL,"PNR010"),
-> (867547,"SBI",7.46635E+15,NULL,"PNR011"),
-> (243535,"UNION BANK",2.43647E+15,NULL,"PNR012"),
-> (354364,"CANARA BANK",5.76879E+15,NULL,"PNR014"),
-> (758900,"UNION BANK",2.43266E+15,NULL,"PNR015")
-> ;
Query OK, 13 rows affected (0.008 sec)
Records: 13 Duplicates: 0 Warnings: 0

MariaDB [cs667_rr]>
```

2. Calculate and update age attribute in User Table.

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select * from user limit 5;
+-----+-----+-----+-----+-----+-----+-----+-----+
| user_id | user_type | fname | lname | age | dob | pincode | street_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
| ADM_001 | ADMIN | Narendra | Modi | NULL | 1989-04-14 | 600047 | Old Jail Road |
| ADM_002 | ADMIN | Droupadi | Murmu | NULL | 1990-04-14 | 640012 | High Street |
| ADM_003 | ADMIN | Manmohan | Singh | NULL | 1991-04-08 | 575003 | Pumpwell Road |
| USR_001 | PSGR | Ajit | Ullal | NULL | 1971-01-01 | 560001 | 10, Janpath |
| USR_002 | PSGR | Muhammed | Ali | NULL | 2000-10-09 | 560003 | 10, Downing |
+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [cs667_rr]> _
```

UPDATE user set age

=DATE_FORMAT(FROM_DAYS(DATEDIFF(now(),DOB)),"%Y")+0;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> update user set age=DATE_FORMAT(FROM_DAYS(DATEDIFF(now(),dob)),"%Y")+0;
Query OK, 33 rows affected (0.020 sec)
Rows matched: 33  Changed: 33  Warnings: 0

MariaDB [cs667_rr]> select * from user limit 5;
+-----+-----+-----+-----+-----+-----+-----+-----+
| user_id | user_type | fname | lname | age | dob | pincode | street_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 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 |
+-----+-----+-----+-----+-----+-----+-----+-----+
5 rows in set (0.001 sec)

MariaDB [cs667_rr]>
```

```

MariaDB [cs667_rr]> select * from user;
+-----+-----+-----+-----+-----+-----+-----+-----+
| user_id | user_type | fname | lname | age | dob | pincode | street_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 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 |
+-----+-----+-----+-----+-----+-----+-----+-----+
33 rows in set (0.001 sec)

MariaDB [cs667_rr]>

```

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

```
select * from route_info where distance<=150 && distance>=70;
```

```

C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select * from route_info where distance<=150 && distance>=70;
+-----+-----+-----+-----+-----+-----+
| from_station_no | to_station_no | from_station_name | to_station_name | distance | train_no |
+-----+-----+-----+-----+-----+-----+
| 1 | 2 | Mangaluru | Kannur | 131 | 25260 |
| 1 | 2 | Chennai | Palakkad | 130 | 25261 |
| 1 | 2 | Bengaluru | Mysore | 139 | 58451 |
| 1 | 2 | Chennai | Sholingur | 90 | 62620 |
| 1 | 2 | Bengaluru | Bangarpet | 71 | 62621 |
| 1 | 3 | Chennai | Katpadi | 129 | 62620 |
| 3 | 4 | Kannur | Mangaluru | 131 | 25261 |
| 3 | 4 | Mysore | Bengaluru | 139 | 58450 |
| 3 | 5 | Katpadi | Chennai | 130 | 62621 |
| 4 | 4 | Palakkad | Chennai | 130 | 25260 |
| 4 | 5 | Bangarpet | Bengaluru | 71 | 62620 |
| 4 | 5 | Sholingur | Chennai | 90 | 62621 |
+-----+-----+-----+-----+-----+-----+
12 rows in set (0.005 sec)

MariaDB [cs667_rr]>

```

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

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

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> select * from route_info where from_station_name="Chennai" && 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 (0.004 sec)

MariaDB [cs667_rr]> _
```

5. Display the train details whose type is not mail.

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

```
C:\Windows\System32\cmd.exe - mysql -u root

MariaDB [cs667_rr]> select * from train where train_type!="mail";
+-----+-----+-----+-----+-----+-----+
| train_no | train_name | train_type | arrival | 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 (0.002 sec)

MariaDB [cs667_rr]> _
```

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

```
select train_name,arrival, destination from train where arrival="Bengaluru" && destination="Chennai";
```

```
MariaDB [cs667_rr]> select train_name,arrival, destination from train where arrival="Bengaluru" && destination="Chennai" ^
;
+-----+-----+-----+
| train_name | arrival | destination |
+-----+-----+-----+
| BEN-CHE Shatabdi | Bengaluru | Chennai |
+-----+-----+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]>
```

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

```
select distinct train_no, departure_time from ticket where departure_time>('08:00:00') && departure="Chennai";
```

```

MariaDB [cs667_rr]> select distinct train_no, departure_time from ticket where departure_time>('08:00:00') && departure="Chennai";
+-----+-----+
| train_no | departure_time |
+-----+-----+
| 25261 | 18:00:00 |
+-----+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]> _

```

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

```
select * from user where dob>=('1980-01-01') && dob<=('1990-01-01');
```

```
select * from user where dob between ('1980-01-01') and ('1990-01-01');
```

```

C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select * from user where dob>=('1980-01-01') && dob<=('1990-01-01');
+-----+-----+-----+-----+-----+-----+-----+-----+
| user_id | user_type | fname | lname | age | dob | pincode | street_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
| ADM_001 | ADMIN | Narendra | Modi | NULL | 1989-04-14 | 600047 | Old Jail Road |
| USR_022 | PSGR | Srihari | Udupa | NULL | 1980-04-14 | 560015 | Suranjan Das Road |
| USR_023 | PSGR | Satish | Kotian | NULL | 1981-04-14 | 600044 | T Nagar |
| USR_024 | PSGR | Shradha | Nayar | NULL | 1982-04-08 | 560006 | M G Road, Bangalore |
| USR_025 | PSGR | Manisha | Solanki | NULL | 1983-04-08 | 575030 | M G Road |
| USR_026 | PSGR | Bharti | Devgan | NULL | 1984-04-14 | 560059 | NAL Wind Tunnel Road |
| USR_027 | PSGR | Roopa | Ram | NULL | 1985-04-14 | 575023 | Bunder Road |
| USR_028 | PSGR | Pallavi | Ram | NULL | 1986-04-08 | 560044 | Lavelle Road |
| USR_029 | PSGR | Ravi | Naik | NULL | 1987-04-14 | 600045 | Thiru V ka Salai |
| USR_030 | PSGR | Virat | Murthy | NULL | 1988-04-14 | 575011 | Bejai New Road |
+-----+-----+-----+-----+-----+-----+-----+-----+
10 rows in set (0.001 sec)

MariaDB [cs667_rr]> _

```

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

```
select * from user where fname like 'S%';
```

```

C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select * from user where fname like 'S%';
+-----+-----+-----+-----+-----+-----+-----+-----+
| user_id | user_type | fname | lname | age | dob | pincode | street_no |
+-----+-----+-----+-----+-----+-----+-----+-----+
| USR_003 | PSGR | Sai Deepak | Reddy | NULL | 1996-12-12 | 600001 | 14, Kailsh Marg |
| USR_007 | PSGR | Smriti | Irani | NULL | 1999-12-16 | 575014 | 4, Banyan Avenie |
| USR_010 | PSGR | Samanta | Prabhu | NULL | 1968-04-14 | 600042 | 8, Clone Colony |
| USR_016 | PSGR | Subbu | Saravana | NULL | 1974-04-14 | 600043 | American Street |
| USR_017 | PSGR | Sheela | Dixit | NULL | 1975-04-08 | 560048 | Kasturba Road |
| USR_021 | PSGR | Suma | Sampat | NULL | 1979-04-08 | 560012 | Old Airport Road, Bangalore |
| USR_022 | PSGR | Srihari | Udupa | NULL | 1980-04-14 | 560015 | Suranjan Das Road |
| USR_023 | PSGR | Satish | Kotian | NULL | 1981-04-14 | 600044 | T Nagar |
| USR_024 | PSGR | Shradha | Nayar | NULL | 1982-04-08 | 560006 | M G Road, Bangalore |
+-----+-----+-----+-----+-----+-----+-----+-----+
9 rows in set (0.004 sec)

MariaDB [cs667_rr]>

```

10. Find the availability of I Class compartment of the train number 62621
select availability from compartment where compartment_type="I Class" &&
train_no=62621;

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select train_no,compartment_type,availability from compartment where compartment_type="I Class" && train_no=62621;
+-----+-----+-----+
| train_no | compartment_type | availability |
+-----+-----+-----+
| 62621 | I Class | 6 |
+-----+-----+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]> _
```

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

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

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> select transaction_id,pnr from payment_info where bank="Union Bank";
+-----+-----+
| transaction_id | pnr |
+-----+-----+
| 243535 | PNR012 |
| 758900 | PNR015 |
| 867546 | PNR010 |
| 978776 | PNR003 |
+-----+-----+
4 rows in set (0.001 sec)

MariaDB [cs667_rr]> _
```

TASK 2:

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

```
MariaDB [cs667_rr]> CREATE USER nikhil IDENTIFIED BY 'nikhil';
Query OK, 0 rows affected (0.013 sec)

MariaDB [cs667_rr]> select user from mysql.user;
+-----+
| User |
+-----+
| nikhil |
| root |
| root |
| pma |
| root |
+-----+
5 rows in set (0.002 sec)

MariaDB [cs667_rr]> _
```

Give only select permission to user 'nikhil' on 'train' table

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> grant select on train to nikhil;
Query OK, 0 rows affected (0.008 sec)

MariaDB [cs667_rr]> show grants for nikhil;
+-----+
| Grants for nikhil@% |
+-----+
| GRANT USAGE ON *.* TO `nikhil`@`%` IDENTIFIED BY PASSWORD '*3F6A582A6C38C6452B4B147744D2E8DDE9A20613' |
| GRANT SELECT ON `cs667_rr`.`train` TO `nikhil`@`%` |
+-----+
2 rows in set (0.000 sec)

MariaDB [cs667_rr]> _
```

Deleting table where the user has no access

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> show tables;
+-----+
| Tables_in_cs667_rr |
+-----+
| train |
+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]> select * from train limit 3;
+-----+
| train_no | train_name | train_type | arrival | destination | availability |
+-----+
| 25260 | Chennai Mail | Mail | Mangaluru | Chennai | Yes |
| 25261 | Managaluru Mail | Mail | Chennai | Mangaluru | Yes |
| 58450 | MAN-BEN Express | Fast | Mangaluru | Bengaluru | yes |
+-----+
3 rows in set (0.001 sec)

MariaDB [cs667_rr]> drop table ticket;
ERROR 1142 (42000): DROP command denied to user 'nikhil'@'localhost' for table 'ticket'
MariaDB [cs667_rr]> _
```


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

Grant permission to nikhil

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> grant update on payment_info to nikhil;
Query OK, 0 rows affected (0.014 sec)

MariaDB [cs667_rr]> grant delete on payment_info to nikhil;
Query OK, 0 rows affected (0.007 sec)

MariaDB [cs667_rr]> grant select on payment_info to nikhil;
Query OK, 0 rows affected (0.005 sec)

MariaDB [cs667_rr]> _
```

Update operation

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> select * from payment_info where transaction_id=146445;
+-----+-----+-----+-----+-----+
| transaction_id | bank | card_no          | price | pnr    |
+-----+-----+-----+-----+-----+
| 146445        | HDFC | 1230000000000000 | NULL  | PNR006 |
+-----+-----+-----+-----+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]> update payment_info set bank="SBI" where transaction_id=146445;
Query OK, 1 row affected (0.007 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [cs667_rr]> select * from payment_info where transaction_id=146445;
+-----+-----+-----+-----+-----+
| transaction_id | bank | card_no          | price | pnr    |
+-----+-----+-----+-----+-----+
| 146445        | SBI  | 1230000000000000 | NULL  | PNR006 |
+-----+-----+-----+-----+-----+
1 row in set (0.001 sec)

MariaDB [cs667_rr]> _
```

Delete operation

row from payment_info where transaction_id=146445

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> select * from payment_info where transaction_id=146445;
+-----+-----+-----+-----+-----+
| transaction_id | bank | card_no          | price | pnr   |
+-----+-----+-----+-----+-----+
|          146445 | SBI  | 1230000000000000 | NULL  | PNR006
+-----+-----+-----+-----+-----+
1 row in set (0.002 sec)

MariaDB [cs667_rr]> delete from payment_info where transaction_id=146445;
Query OK, 1 row affected (0.009 sec)

MariaDB [cs667_rr]> select * from payment_info where transaction_id=146445;
Empty set (0.001 sec)

MariaDB [cs667_rr]> _
```

Revoke operation

```
C:\Windows\System32\cmd.exe - mysql -u root
MariaDB [cs667_rr]> show grants for nikhil;
+-----+-----+-----+-----+-----+
| Grants for nikhil@% |
+-----+-----+-----+-----+
| GRANT USAGE ON *.* TO `nikhil`@`%` IDENTIFIED BY PASSWORD '*3F6A582A6C38C6452B4B147744D2E8DDE9A20613' |
| GRANT SELECT ON `cs667_rr`.`train` TO `nikhil`@`%` |
| GRANT SELECT, UPDATE, DELETE ON `cs667_rr`.`payment_info` TO `nikhil`@`%` |
+-----+-----+-----+-----+-----+
3 rows in set (0.001 sec)

MariaDB [cs667_rr]> revoke select on payment_info from nikhil;
Query OK, 0 rows affected (0.004 sec)

MariaDB [cs667_rr]> show grants for nikhil;
+-----+-----+-----+-----+-----+
| Grants for nikhil@% |
+-----+-----+-----+-----+
| GRANT USAGE ON *.* TO `nikhil`@`%` IDENTIFIED BY PASSWORD '*3F6A582A6C38C6452B4B147744D2E8DDE9A20613' |
| GRANT SELECT ON `cs667_rr`.`train` TO `nikhil`@`%` |
| GRANT UPDATE, DELETE ON `cs667_rr`.`payment_info` TO `nikhil`@`%` |
+-----+-----+-----+-----+-----+
3 rows in set (0.000 sec)

MariaDB [cs667_rr]>
```

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> select * from payment_info;
ERROR 1142 (42000): SELECT command denied to user 'nikhil'@'localhost' for table 'payment_info'
MariaDB [cs667_rr]> _
```

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

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast       | I Class          | 2.75        |
| Fast       | II Class         | 1.6         |
| Fast       | III Class        | 1.1         |
| Mail       | I Class          | 2.3         |
| Mail       | II Class         | 1.35        |
| Mail       | III Class        | 0.95        |
| Superfast  | I Class          | 3.3         |
| Superfast  | II Class         | 1.92        |
| Superfast  | III Class        | 1.32        |
| SuperMail  | I Class          | 1.2         |
+-----+-----+-----+
10 rows in set (0.001 sec)

MariaDB [cs667_rr]> start transaction;
Query OK, 0 rows affected (0.006 sec)

MariaDB [cs667_rr]> set autocommit=0;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]> insert into fare_table values ("Mail","IV Class", 1.2);
Query OK, 1 row affected (0.001 sec)

MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast       | I Class          | 2.75        |
| Fast       | II Class         | 1.6         |
| Fast       | III Class        | 1.1         |
| Mail       | I Class          | 2.3         |
| Mail       | II Class         | 1.35        |
| Mail       | III Class        | 0.95        |
| Mail       | IV Class         | 1.2         |
| Superfast  | I Class          | 3.3         |
| Superfast  | II Class         | 1.92        |
| Superfast  | III Class        | 1.32        |
| SuperMail  | I Class          | 1.2         |
+-----+-----+-----+
11 rows in set (0.001 sec)

MariaDB [cs667_rr]> _
```

Savepoint

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p
MariaDB [cs667_rr]> savepoint s1;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast      | I Class          | 2.75        |
| Fast      | II Class         | 1.6         |
| Fast      | III Class        | 1.1         |
| Mail      | I Class          | 2.3         |
| Mail      | II Class         | 1.35        |
| Mail      | III Class        | 0.95        |
| Mail      | IV Class         | 1.2         |
| Superfast | I Class          | 3.3         |
| Superfast | II Class         | 1.92        |
| Superfast | III Class        | 1.32        |
| SuperMail | I Class          | 1.2         |
+-----+-----+-----+
11 rows in set (0.001 sec)

MariaDB [cs667_rr]> insert into fare_table values ("Fast", "IV Class",0.5);
Query OK, 1 row affected (0.001 sec)

MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast      | I Class          | 2.75        |
| Fast      | II Class         | 1.6         |
| Fast      | III Class        | 1.1         |
| Fast      | IV Class         | 0.5         |
| Mail      | I Class          | 2.3         |
| Mail      | II Class         | 1.35        |
| Mail      | III Class        | 0.95        |
| Mail      | IV Class         | 1.2         |
| Superfast | I Class          | 3.3         |
| Superfast | II Class         | 1.92        |
| Superfast | III Class        | 1.32        |
| SuperMail | I Class          | 1.2         |
+-----+-----+-----+
12 rows in set (0.001 sec)
```

Rollback

```
MariaDB [cs667_rr]> rollback to s1;
Query OK, 0 rows affected (0.003 sec)

MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast      | I Class          | 2.75        |
| Fast      | II Class         | 1.6         |
| Fast      | III Class        | 1.1         |
| Mail      | I Class          | 2.3         |
| Mail      | II Class         | 1.35        |
| Mail      | III Class        | 0.95        |
| Mail      | IV Class         | 1.2         |
| Superfast | I Class          | 3.3         |
| Superfast | II Class         | 1.92        |
| Superfast | III Class        | 1.32        |
| SuperMail | I Class          | 1.2         |
+-----+-----+-----+
11 rows in set (0.001 sec)

MariaDB [cs667_rr]>
```

C:\Windows\System32\cmd.exe - mysql -u nikhil -p

MariaDB [cs667_rr]> select * from fare_table;

train_type	compartment_type	fare_per_km
Fast	I Class	2.75
Fast	II Class	1.6
Fast	III Class	1.1
Mail	I Class	2.3
Mail	II Class	1.35
Mail	III Class	0.95
Mail	IV Class	1.2
Superfast	I Class	3.3
Superfast	II Class	1.92
Superfast	III Class	1.32

10 rows in set (0.001 sec)

MariaDB [cs667_rr]> insert into fare_table values ("Supermail","I Class", 2);
Query OK, 1 row affected (0.001 sec)

MariaDB [cs667_rr]> savepoint s2;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]> rollback to s1;
Query OK, 0 rows affected (0.001 sec)

MariaDB [cs667_rr]> select * from fare_table;

train_type	compartment_type	fare_per_km
Fast	I Class	2.75
Fast	II Class	1.6
Fast	III Class	1.1
Mail	I Class	2.3
Mail	II Class	1.35
Mail	III Class	0.95
Mail	IV Class	1.2
Superfast	I Class	3.3
Superfast	II Class	1.92
Superfast	III Class	1.32
SuperMail	I Class	1.2

11 rows in set (0.001 sec)

MariaDB [cs667_rr]> █

Release and commit

```
C:\Windows\System32\cmd.exe - mysql -u nikhil -p

MariaDB [cs667_rr]> savepoint s2;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]> select * from fare_table;
+-----+-----+-----+
| train_type | compartment_type | fare_per_km |
+-----+-----+-----+
| Fast       | I Class          | 2.75        |
| Fast       | II Class         | 1.6         |
| Fast       | III Class        | 1.1         |
| Mail       | I Class          | 2.3         |
| Mail       | II Class         | 1.35        |
| Mail       | III Class        | 0.95        |
| Mail       | IV Class         | 1.2         |
| Superfast  | I Class          | 3.3         |
| Superfast  | II Class         | 1.92        |
| Superfast  | III Class        | 1.32        |
| Superfast  | IV Class         | 1.12        |
+-----+-----+-----+
11 rows in set (0.001 sec)

MariaDB [cs667_rr]> release savepoint s2;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]> commit;
Query OK, 0 rows affected (0.000 sec)

MariaDB [cs667_rr]>
```