DBMS – Mini Project
Vehicle Parking System

Submitted By:
Name: Utkarsh Bagaria
SRN: PES1UG20CS477
V Semester Section _H

Short Description and Scope of the Project

Parking management system for managing the records of the incoming and outgoing vehicles in a parking house.

Now days in many public places such as malls, multiplex system, hospitals, offices, market areas there is a crucial problem of vehicle parking. The vehicle parking area has many lanes/slots for car parking. So, to park a vehicle one has to look for all the lanes. Moreover, this involves a lot of manual labour and investment. Instead of vehicle caught in towing the vehicle can park on safe and security with low cost.

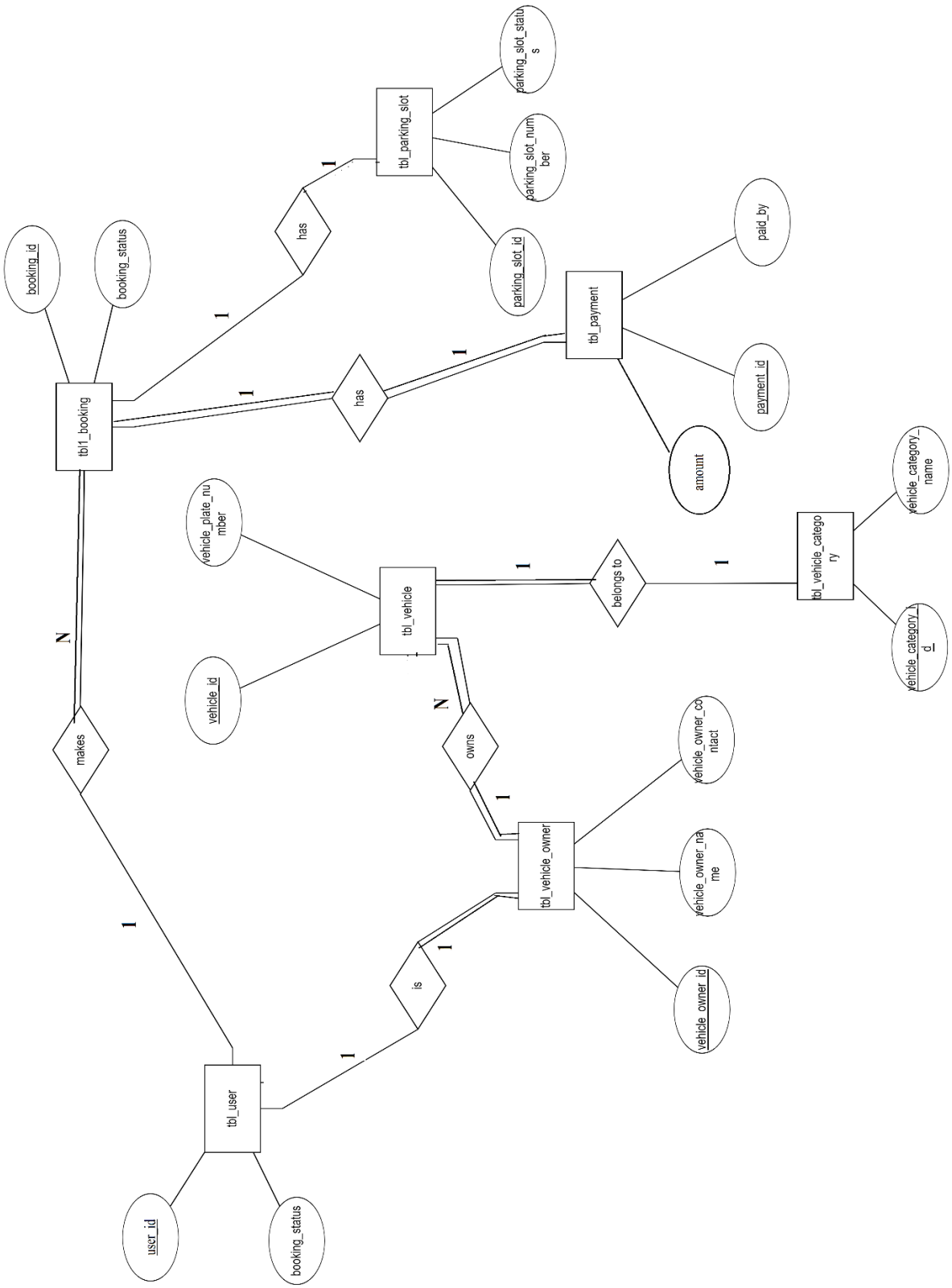
Parking control system has been generated in such a way that it is filled with many secure devices such as, parking control gates, toll gates, time and attendance machine, car counting system etc. These features are hereby very necessary nowadays to secure your car and also to evaluate the fee structure for every vehicle's entry and exit

The objective of this project is to build a Vehicle Parking management system that enables the time management. The system that will track the entry and exit of cars, maintain a listing of cars within the parking lot, and determine if the parking lot is full or not. It will determine the cost of per vehicle according to their time consumption.

In the modern age. Many people have vehicles. Vehicle is now a basic need. Every place is under the process of urbanization. There are many corporate offices and shopping centres etc. There are many recreational places where people used to go for refreshment. So, all these places need a parking space where people can park their vehicles safely and easily. Every parking area needs a system that records the detail of vehicles to give the facility. These systems might be computerized or non-computerized. With the help of computerized system, we can deliver a good service to customer who wants to park their vehicle into the any organization's premises.

Vehicle parking management system is an automatic system which delivers data processing in very high speed in systematic manner. Parking is a growing need of the time. Development of this system is very useful in this area of field. By using our system, they can maintain records very easily. Our system covers every area of parking management. In coming future there will be excessive need of Vehicle parking management system.

ER Diagram


tbl_booking
booking_id
booking_status
has
tbl_parking_slot
parking_slot_status
parking_slot_number
parking_slot_id
has
tbl_payment
paid_by
payment_id
amount
makes
tbl_vehicle
vehicle_plate_number
vehicle_id
belongs to
tbl_vehicle_category
vehicle_category_name
vehicle_category_id
owns
tbl_vehicle_owner
vehicle_owner_contact
vehicle_owner_name
vehicle_owner_id
is
tbl_user
user_id
booking_status
1
N

Relational Schema

DDL statements - Building the database

Creating tables:

tbl_booking

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_booking` (
    ->   `booking_id` int(11) NOT NULL,
    ->   `customer_id` int(11) NOT NULL,
    ->   `vehicle_id` int(11) NOT NULL,
    ->   `slot_id` int(11) NOT NULL,
    ->   `booking_status` int(1) NOT NULL,
    ->   `user_id` int(11) NOT NULL
    -> );
Query OK, 0 rows affected (0.017 sec)

MariaDB [477_vehicle_parking]>
```

tbl_parking_slot

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_parking_slot` (
    ->   `parking_slot_id` int(11) NOT NULL,
    ->   `parking_slot_number` int(4) NOT NULL,
    ->   `parking_slot_status` int(1) NOT NULL,
    ->   `user_id` int(11) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.019 sec)

MariaDB [477_vehicle_parking]>
```

tbl_payment

```
MariaDB [477_vehicle_parking]>  CREATE TABLE `tbl_payment` (
    ->   `payment_id` int(11) NOT NULL,
    ->   `booking_id` int(11) NOT NULL,
    ->   `paid_by` varchar(30) NOT NULL,
    ->   `amount` int(11) NOT NULL,
    ->   `user_id` int(11) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.015 sec)

MariaDB [477 vehicle parking]>
```

tbl_user

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_user` (
    ->   `user_id` int(11) NOT NULL,
    ->   `fullname` varchar(50) NOT NULL,
    ->   `contact` varchar(15) NOT NULL,
    ->   `status` int(1) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.023 sec)

MariaDB [477_vehicle_parking]>
```

tbl_vehicle

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_vehicle` (
    ->   `vehicle_id` int(11) NOT NULL,
    ->   `vehicle_category_id` int(11) NOT NULL,
    ->   `vehicle_plate_number` varchar(15) NOT NULL,
    ->   `vehicle_owner_id` int(11) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.014 sec)

MariaDB [477_vehicle_parking]>
```

tbl_vehice_category

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_vehicle_category` (
    ->   `vehicle_category_id` int(11) NOT NULL,
    ->   `vehicle_category_name` varchar(30) NOT NULL,
    ->   `user_id` int(11) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.013 sec)

MariaDB [477_vehicle_parking]>
```

tbl1_vehicle_owner

```
MariaDB [477_vehicle_parking]> CREATE TABLE `tbl_vehicle_owner` (
    ->   `vehicle_owner_id` int(11) NOT NULL,
    ->   `vehicle_owner_name` varchar(30) NOT NULL,
    ->   `vehicle_owner_contact` varchar(15) NOT NULL,
    ->   `user_id` int(11) NOT NULL
    -> ) ;
Query OK, 0 rows affected (0.014 sec)

MariaDB [477_vehicle_parking]>
```

Alter

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_booking`
    ->   ADD PRIMARY KEY (`booking_id`),
    ->   ADD KEY `customer_id` (`customer_id`),
    ->   ADD KEY `vehicle_id` (`vehicle_id`),
    ->   ADD KEY `slot_id` (`slot_id`),
    ->   ADD KEY `user_id` (`user_id`);
Query OK, 0 rows affected (0.032 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_parking_slot`
    ->   ADD PRIMARY KEY (`parking_slot_id`),
    ->   ADD KEY `user_id` (`user_id`);
Query OK, 0 rows affected (0.030 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_payment`
    ->   ADD PRIMARY KEY (`payment_id`),
    ->   ADD KEY `booking_id` (`booking_id`),
    ->   ADD KEY `user_id` (`user_id`);
Query OK, 0 rows affected (0.025 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_user`
    ->   ADD PRIMARY KEY (`user_id`);
Query OK, 0 rows affected (0.024 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle`
    ->   ADD PRIMARY KEY (`vehicle_id`),
    ->   ADD KEY `vehicle_owner_id` (`vehicle_owner_id`),
    ->   ADD KEY `vehicle_category_id` (`vehicle_category_id`);
Query OK, 0 rows affected (0.024 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_category`
    ->   ADD PRIMARY KEY (`vehicle_category_id`),
    ->   ADD KEY `user_id` (`user_id`);
Query OK, 0 rows affected (0.040 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_owner`
    ->   ADD PRIMARY KEY (`vehicle_owner_id`),
    ->   ADD KEY `user_id` (`user_id`);
Query OK, 0 rows affected (0.025 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

Modify

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_booking`
    ->   MODIFY `booking_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.039 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_parking_slot`
    ->   MODIFY `parking_slot_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 5 rows affected (0.028 sec)
Records: 5  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_payment`
    ->   MODIFY `payment_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.024 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_user`
    ->   MODIFY `user_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.026 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle`
    ->   MODIFY `vehicle_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.030 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_category`
    ->   MODIFY `vehicle_category_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.088 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_owner`
    ->   MODIFY `vehicle_owner_id` int(11) NOT NULL AUTO_INCREMENT;
Query OK, 3 rows affected (0.031 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

Adding Constraints

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_booking`
    ->   ADD CONSTRAINT `tbl_booking_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `tbl_user` (`user_id`) ON DELETE CASC
ADE ON UPDATE CASCADE,
    ->   ADD CONSTRAINT `tbl_booking_ibfk_2` FOREIGN KEY (`customer_id`) REFERENCES `tbl_vehicle_owner` (`vehicle_own
er_id`) ON DELETE CASCADE ON UPDATE CASCADE,
    ->   ADD CONSTRAINT `tbl_booking_ibfk_3` FOREIGN KEY (`vehicle_id`) REFERENCES `tbl_vehicle` (`vehicle_id`) ON DE
LETE CASCADE ON UPDATE CASCADE,
    ->   ADD CONSTRAINT `tbl_booking_ibfk_4` FOREIGN KEY (`slot_id`) REFERENCES `tbl_parking_slot` (`parking_slot_id`
) ON DELETE CASCADE ON UPDATE CASCADE;
Query OK, 3 rows affected (0.036 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_parking_slot`
    ->   ADD CONSTRAINT `tbl_parking_slot_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `tbl_user` (`user_id`) ON DELETE
 CASCADE ON UPDATE CASCADE;
Query OK, 0 rows affected (0.007 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_payment`
    ->   ADD CONSTRAINT `tbl_payment_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `tbl_user` (`user_id`) ON DELETE CASC
ADE ON UPDATE CASCADE,
    ->   ADD CONSTRAINT `tbl_payment_ibfk_2` FOREIGN KEY (`booking_id`) REFERENCES `tbl_booking` (`booking_id`) ON DE
LETE CASCADE ON UPDATE CASCADE;
Query OK, 0 rows affected (0.007 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle`
    ->   ADD CONSTRAINT `tbl_vehicle_ibfk_1` FOREIGN KEY (`vehicle_category_id`) REFERENCES `tbl_vehicle_category` (`
vehicle_category_id`) ON DELETE CASCADE ON UPDATE CASCADE,
    ->   ADD CONSTRAINT `tbl_vehicle_ibfk_2` FOREIGN KEY (`vehicle_owner_id`) REFERENCES `tbl_vehicle_owner` (`vehicl
e_owner_id`) ON DELETE CASCADE ON UPDATE CASCADE;
Query OK, 0 rows affected (0.009 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_category`
    ->   ADD CONSTRAINT `tbl_vehicle_category_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `tbl_user` (`user_id`) ON DE
LETE CASCADE ON UPDATE CASCADE;
Query OK, 0 rows affected (0.008 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> ALTER TABLE `tbl_vehicle_owner`
    ->   ADD CONSTRAINT `tbl_vehicle_owner_ibfk_1` FOREIGN KEY (`user_id`) REFERENCES `tbl_user` (`user_id`) ON DELET
E CASCADE ON UPDATE CASCADE;
Query OK, 0 rows affected (0.007 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]>
```

Populating the Database

Loading from a csv file

```
MariaDB [477_vehicle_parking]> LOAD DATA INFILE 'D:/Sem-5/LAB/DBMS/Project/booking_val.csv'
    -> INTO TABLE tbl_booking
    -> COLUMNS TERMINATED BY ','
    -> OPTIONALLY ENCLOSED BY '"'
    -> ESCAPED BY '"'
    -> LINES TERMINATED BY '\n'
    -> IGNORE 1 LINES;
Query OK, 3 rows affected, 3 warnings (0.002 sec)
Records: 3  Deleted: 0  Skipped: 0  Warnings: 3

MariaDB [477_vehicle_parking]> select * from tbl_booking
    -> ;
+------------+-------------+------------+---------+----------------+---------+
| booking_id | customer_id | vehicle_id | slot_id | booking_status | user_id |
+------------+-------------+------------+---------+----------------+---------+
|        999 |        1000 |       2524 |      20 |              1 |   69892 |
|        998 |        1001 |       2382 |      22 |              1 |   63902 |
|        997 |        1002 |       2392 |      23 |              1 |   69322 |
+------------+-------------+------------+---------+----------------+---------+
3 rows in set (0.031 sec)

MariaDB [477_vehicle_parking]>
```

Insert into values

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_parking_slot` (`parking_slot_id`, `parking_slot_number`, `parking_slot_status`, `user_id`) VALUES
    -> (20, 14, 1, 69892),
    -> (21, 16, 0, NULL),
    -> (22, 17, 1, 63902),
    -> (23, 21, 1, 69322),
    -> (24, 25, 1, NULL);
Query OK, 5 rows affected, 2 warnings (0.004 sec)
Records: 5  Duplicates: 0  Warnings: 2

MariaDB [477_vehicle_parking]> select *from tbl_parking_slot
    -> ;
+----------------+--------------------+--------------------+---------+
| parking_slot_id | parking_slot_number | parking_slot_status | user_id |
+----------------+--------------------+--------------------+---------+
|             20 |                 14 |                  1 |   69892 |
|             21 |                 16 |                  0 |       0 |
|             22 |                 17 |                  1 |   63902 |
|             23 |                 21 |                  1 |   69322 |
|             24 |                 25 |                  1 |       0 |
+----------------+--------------------+--------------------+---------+
5 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_payment` (`payment_id`, `booking_id`, `paid_by`,`amount`, `user_id`)
VALUES
    -> (97291, 999, 'Aron',10, 69892),
    -> (80311, 998, 'John',30, 63902),
    -> (19201, 997, 'Snow',50, 69322);
Query OK, 3 rows affected (0.003 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]> select *from tbl_payment
    -> ;
+------------+------------+---------+--------+---------+
| payment_id | booking_id | paid_by | amount | user_id |
+------------+------------+---------+--------+---------+
|      97291 |        999 | Aron    |     10 |   69892 |
|      80311 |        998 | John    |     30 |   63902 |
|      19201 |        997 | Snow    |     50 |   69322 |
+------------+------------+---------+--------+---------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_user` (`user_id`, `fullname`, `contact`, `status`) VALUES
    -> (69892, 'Aron Bond', '1234567890', 1),
    -> (63902, 'John M', '0987654321', 1),
    -> (69322, 'Snow B', '1111199999', 1);
Query OK, 3 rows affected (0.002 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]> select *from tbl_user;
+---------+-----------+------------+--------+
| user_id | fullname  | contact    | status |
+---------+-----------+------------+--------+
|   69892 | Aron Bond | 1234567890 |      1 |
|   63902 | John M    | 0987654321 |      1 |
|   69322 | Snow B    | 1111199999 |      1 |
+---------+-----------+------------+--------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_vehicle` (`vehicle_id`, `vehicle_category_id`, `vehicle_plate_number`
, `vehicle_owner_id`) VALUES
    -> (2524, 2, 'KA1234', 1000),
    -> (2382, 4, 'WB5678', 1001),
    -> (2392, 5, 'MA1920', 1002);
Query OK, 3 rows affected (0.003 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]> select * from tbl_vehicle;
+------------+--------------------+----------------------+------------------+
| vehicle_id | vehicle_category_id | vehicle_plate_number | vehicle_owner_id |
+------------+--------------------+----------------------+------------------+
|       2524 |                  2 | KA1234               |             1000 |
|       2382 |                  4 | WB5678               |             1001 |
|       2392 |                  5 | MA1920               |             1002 |
+------------+--------------------+----------------------+------------------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_vehicle_category` (`vehicle_category_id`, `vehicle_category_name`, `u
ser_id`) VALUES
    -> (2, 'Bike', 69892),
    -> (4, 'Car', 63902),
    -> (5, 'Bus', 69322);
Query OK, 3 rows affected (0.003 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]> select * from tbl_vehicle_category;
+--------------------+----------------------+---------+
| vehicle_category_id | vehicle_category_name | user_id |
+--------------------+----------------------+---------+
|                  2 | Bike                 |   69892 |
|                  4 | Car                  |   63902 |
|                  5 | Bus                  |   69322 |
+--------------------+----------------------+---------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

```
MariaDB [477_vehicle_parking]> INSERT INTO `tbl_vehicle_owner` (`vehicle_owner_id`, `vehicle_owner_name`, `vehicle_ow
ner_contact`, `user_id`) VALUES
    -> (1000, 'Aron Bond', '1234567890', 69892),
    -> (1001, 'John M', '0987654321', 63902),
    -> (1002, 'Snow B', '1111199999', 69322);
Query OK, 3 rows affected (0.003 sec)
Records: 3  Duplicates: 0  Warnings: 0

MariaDB [477_vehicle_parking]> select *from tbl_vehicle_owner;
+-----------------+-------------------+----------------------+---------+
| vehicle_owner_id | vehicle_owner_name | vehicle_owner_contact | user_id |
+-----------------+-------------------+----------------------+---------+
|            1000 | Aron Bond          | 1234567890           |   69892 |
|            1001 | John M             | 0987654321           |   63902 |
|            1002 | Snow B             | 1111199999           |   69322 |
+-----------------+-------------------+----------------------+---------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

Join Queries

1) Get all the booking details with payment details

```
MariaDB [477_vehicle_parking]> SELECT * FROM tbl_booking join tbl_payment on tbl_booking.user_id=tbl_payment.user_id;
+------------+-------------+------------+---------+----------------+---------+------------+------------+---------+--------+---------+
| booking_id | customer_id | vehicle_id | slot_id | booking_status | user_id | payment_id | booking_id | paid_by | amount | user_id |
+------------+-------------+------------+---------+----------------+---------+------------+------------+---------+--------+---------+
|        997 |        1002 |       2392 |      23 |              1 |   69322 |      19201 |        997 | Snow    |     50 |   69322 |
|        998 |        1001 |       2382 |      22 |              1 |   63902 |      80311 |        998 | John    |     30 |   63902 |
|        999 |        1000 |       2524 |      20 |              1 |   69892 |      97291 |        999 | Aron    |     10 |   69892 |
+------------+-------------+------------+---------+----------------+---------+------------+------------+---------+--------+---------+
3 rows in set (0.006 sec)

MariaDB [477_vehicle_parking]>
```

2) Get each booking with all the vehicle owner details

```
MariaDB [477_vehicle_parking]> SELECT * FROM tbl_booking right outer join tbl_vehicle_owner on tbl_booking.user_id=tbl_vehicle_owner.user_id;
+------------+-------------+------------+---------+----------------+---------+-----------------+--------------------+----------------------+---------+
| booking_id | customer_id | vehicle_id | slot_id | booking_status | user_id | vehicle_owner_id | vehicle_owner_name | vehicle_owner_contact | user_id |
+------------+-------------+------------+---------+----------------+---------+-----------------+--------------------+----------------------+---------+
|        997 |        1002 |       2392 |      23 |              1 |   69322 |            1002 | Snow B             | 1111199999           |   69322 |
|        998 |        1001 |       2382 |      22 |              1 |   63902 |            1001 | John M             | 0987654321           |   63902 |
|        999 |        1000 |       2524 |      20 |              1 |   69892 |            1000 | Aron Bond          | 1234567890           |   69892 |
+------------+-------------+------------+---------+----------------+---------+-----------------+--------------------+----------------------+---------+
3 rows in set (0.001 sec)

MariaDB [477_vehicle_parking]>
```

3) Get all the booking details with each user

```
MariaDB [477_vehicle_parking]> SELECT * FROM tbl_booking left outer join tbl_user on tbl_booking.user_id=tbl_user.user_id;
+------------+-------------+------------+---------+----------------+---------+---------+-----------+------------+--------+
| booking_id | customer_id | vehicle_id | slot_id | booking_status | user_id | user_id | fullname  | contact    | status |
+------------+-------------+------------+---------+----------------+---------+---------+-----------+------------+--------+
|        997 |        1002 |       2392 |      23 |              1 |   69322 |   69322 | Snow B    | 1111199999 |      1 |
|        998 |        1001 |       2382 |      22 |              1 |   63902 |   63902 | John M    | 0987654321 |      1 |
|        999 |        1000 |       2524 |      20 |              1 |   69892 |   69892 | Aron Bond | 1234567890 |      1 |
+------------+-------------+------------+---------+----------------+---------+---------+-----------+------------+--------+
3 rows in set (0.002 sec)

MariaDB [477_vehicle_parking]>
```

4) Get all the vehicle details with vehicle owner details and category details

```
MariaDB [477_vehicle_parking]> SELECT * FROM tbl_vehicle join tbl_vehicle_owner on tbl_vehicle.vehicle_owner_id=tbl_vehicle_owner.vehicle_owner_id join tbl_vehicle_category on tbl_vehicle.vehicle_category_id=tbl_vehicle_
category.vehicle_category_id;
+------------+--------------------+----------------------+-----------------+-----------------+--------------------+----------------------+---------+--------------------+----------------------+---------+
| vehicle_id | vehicle_category_id | vehicle_plate_number | vehicle_owner_id | vehicle_owner_id | vehicle_owner_name | vehicle_owner_contact | user_id | vehicle_category_id | vehicle_category_name | user_id |
+------------+--------------------+----------------------+-----------------+-----------------+--------------------+----------------------+---------+--------------------+----------------------+---------+
|       2524 |                  2 | KA1234               |            1000 |            1000 | Aron Bond          | 1234567890           |   69892 |                  2 | Bike                 |   69892 |
|       2382 |                  4 | WB5678               |            1001 |            1001 | John M             | 0987654321           |   63902 |                  4 | Car                  |   63902 |
|       2392 |                  5 | MA1920               |            1002 |            1002 | Snow B             | 1111199999           |   69322 |                  5 | Bus                  |   69322 |
+------------+--------------------+----------------------+-----------------+-----------------+--------------------+----------------------+---------+--------------------+----------------------+---------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

Aggregate Functions

1) Get the total number of bookings

```
MariaDB [477_vehicle_parking]> SELECT COUNT(*) FROM tbl_booking;
+----------+
| COUNT(*) |
+----------+
|        3 |
+----------+
1 row in set (0.002 sec)

MariaDB [477_vehicle_parking]>
```

2) get the total amount paid

```
MariaDB [477_vehicle_parking]> SELECT SUM(amount) FROM tbl_payment;
+-------------+
| SUM(amount) |
+-------------+
|          90 |
+-------------+
1 row in set (0.001 sec)

MariaDB [477_vehicle_parking]>
```

3) get the min max payments

```
MariaDB [477_vehicle_parking]> SELECT max(amount) as Max_Cost,min(amount) as Min_Cost FROM tbl_payment;
+----------+----------+
| Max_Cost | Min_Cost |
+----------+----------+
|       50 |       10 |
+----------+----------+
1 row in set (0.001 sec)

MariaDB [477_vehicle_parking]>
```

4) get the total number of 2 wheelers

```
MariaDB [477_vehicle_parking]> SELECT COUNT(*) FROM tbl_vehicle where vehicle_category_id=2;
+----------+
| COUNT(*) |
+----------+
|        1 |
+----------+
1 row in set (0.001 sec)

MariaDB [477_vehicle_parking]>
```

Set Operations

1) Find the users with active booking and an active slot

```
MariaDB [477_vehicle_parking]> SELECT U.user_id,U.fullname
    -> FROM tbl_user as U, tbl_booking as B
    -> WHERE U.user_id=B.user_id and B.booking_status=1
    -> UNION
    -> SELECT P.parking_slot_id,P.parking_slot_number
    -> FROM tbl_user as U1, tbl_parking_slot as P
    -> WHERE U1.user_id=P.user_id and P.parking_slot_status=1;
+---------+-----------+
| user_id | fullname  |
+---------+-----------+
|   69322 | Snow B    |
|   63902 | John M    |
|   69892 | Aron Bond |
|      20 | 14        |
|      22 | 17        |
|      23 | 21        |
+---------+-----------+
6 rows in set (0.003 sec)

MariaDB [477_vehicle_parking]>
```

2) Get the details about vehicle owner when vehicle is 2-wheeler or not

```
MariaDB [477_vehicle_parking]> SELECT V.vehicle_id,V.vehicle_plate_number
    -> FROM tbl_vehicle as V, tbl_vehicle_owner as VO
    -> WHERE V.vehicle_owner_id=VO.vehicle_owner_id
    -> UNION
    -> SELECT V1.vehicle_id,V1.vehicle_plate_number
    -> FROM tbl_vehicle as V1, tbl_vehicle_category as VCO
    -> WHERE V1.vehicle_category_id=VCO.vehicle_category_id and VCO.vehicle_category_id=2;
+------------+----------------------+
| vehicle_id | vehicle_plate_number |
+------------+----------------------+
|       2382 | WB5678               |
|       2392 | MA1920               |
|       2524 | KA1234               |
+------------+----------------------+
3 rows in set (0.005 sec)

MariaDB [477_vehicle_parking]>
```

3) Get the details about vehicle owner when vehicle is 4-wheeler or not

```
MariaDB [477_vehicle_parking]> SELECT V.vehicle_id,V.vehicle_plate_number
    -> FROM tbl_vehicle as V, tbl_vehicle_owner as VO
    -> WHERE V.vehicle_owner_id=VO.vehicle_owner_id
    -> UNION
    -> SELECT V1.vehicle_id,V1.vehicle_plate_number
    -> FROM tbl_vehicle as V1, tbl_vehicle_category as VCO
    -> WHERE V1.vehicle_category_id=VCO.vehicle_category_id and VCO.vehicle_category_id=4;
+------------+----------------------+
| vehicle_id | vehicle_plate_number |
+------------+----------------------+
|       2382 | WB5678               |
|       2392 | MA1920               |
|       2524 | KA1234               |
+------------+----------------------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

4) Find the users with inactive booking or inactive slot

```
MariaDB [477_vehicle_parking]> SELECT U.user_id,U.fullname
    -> FROM tbl_user as U, tbl_booking as B
    -> WHERE U.user_id=B.user_id and B.booking_status=1 and
    -> EXISTS(
    -> SELECT U1.user_id,U1.fullname
    -> FROM tbl_user as U1, tbl_parking_slot as P
    -> WHERE U1.user_id=P.user_id and P.parking_slot_status=0
    -> );
Empty set (0.003 sec)

MariaDB [477_vehicle_parking]>
```

Functions and Procedures

Function to determine active booking

```
MariaDB [477_vehicle_parking]> DELIMITER $$
MariaDB [477_vehicle_parking]> CREATE FUNCTION active_booking(booking_status int(1))
    -> RETURNS varchar(150)
    -> DETERMINISTIC
    -> BEGIN
    -> DECLARE value varchar(150);
    -> IF ((booking_status) = 1) then
    -> SET value = "You have an active booking";
    -> ELSE
    -> SET value = "Your booking has either expired or you have no booking";
    -> END IF;
    -> RETURN value;
    -> END $$
Query OK, 0 rows affected (0.002 sec)

MariaDB [477_vehicle_parking]> DELIMITER;
    -> Bye

utkar@LAPTOP-UMRGJK0E c:\xampp
# mysql -u root
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 477_vehicle_parking
Database changed
MariaDB [477_vehicle_parking]> WITH dat as
    -> (SELECT user_id, booking_status FROM tbl_booking)
    -> SELECT user_id, booking_status, active_booking(booking_status) as stat FROM dat;
+---------+----------------+---------------------------+
| user_id | booking_status | stat                      |
+---------+----------------+---------------------------+
|   69322 |              1 | You have an active booking |
|   63902 |              1 | You have an active booking |
|   69892 |              1 | You have an active booking |
+---------+----------------+---------------------------+
3 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

Procedure to check active parking_slot

```
MariaDB [477_vehicle_parking]> CREATE PROCEDURE empty_slot(
    -> IN id int,IN st int, OUT msg varchar(50))
    -> BEGIN
    -> DECLARE `parking_slot_status` int;
    -> UPDATE tbl_parking_slot
    -> SET `parking_slot_status` = st
    -> WHERE parking_slot_id= id;
    -> SET msg='slot updated';
    -> END;$$
Query OK, 0 rows affected (0.004 sec)
```

```
MariaDB [477_vehicle_parking]> SELECT * FROM tbl_parking_slot;
+-----------------+---------------------+---------------------+---------+
| parking_slot_id | parking_slot_number | parking_slot_status | user_id |
+-----------------+---------------------+---------------------+---------+
|              20 |                  14 |                   1 |   69892 |
|              21 |                  16 |                   0 |       0 |
|              22 |                  17 |                   1 |   63902 |
|              23 |                  21 |                   1 |   69322 |
|              24 |                  25 |                   1 |       0 |
+-----------------+---------------------+---------------------+---------+
5 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]> CALL empty_slot(24,0,@msg);
Query OK, 1 row affected (0.010 sec)

MariaDB [477_vehicle_parking]> SELECT @msg;
+--------------+
| @msg         |
+--------------+
| slot updated |
+--------------+
1 row in set (0.000 sec)

MariaDB [477_vehicle_parking]> SELECT * FROM tbl_parking_slot;
+-----------------+---------------------+---------------------+---------+
| parking_slot_id | parking_slot_number | parking_slot_status | user_id |
+-----------------+---------------------+---------------------+---------+
|              20 |                  14 |                   1 |   69892 |
|              21 |                  16 |                   0 |       0 |
|              22 |                  17 |                   1 |   63902 |
|              23 |                  21 |                   1 |   69322 |
|              24 |                  25 |                   0 |       0 |
+-----------------+---------------------+---------------------+---------+
5 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

Triggers and Cursors

Trigger to backup any deleted slots

```
MariaDB [477_vehicle_parking]> CREATE TABLE `DEL_parking_slot` (
    ->   `booking_id` int(11) NOT NULL,
    ->   `customer_id` int(11) NOT NULL,
    ->   `vehicle_id` int(11) NOT NULL,
    ->   `slot_id` int(11) NOT NULL,
    ->   `booking_status` int(1) NOT NULL,
    ->   `user_id` int(11)
    -> ) ;
Query OK, 0 rows affected (0.015 sec)
```

```
MariaDB [477_vehicle_parking]> CREATE TRIGGER booking_stat BEFORE DELETE ON tbl_parking_slot
    -> FOR EACH ROW
    -> BEGIN
    -> INSERT INTO DEL_parking_slot SELECT * FROM tbl_booking where slot_id = old.parking_slot_id;
    -> END;$$
Query OK, 0 rows affected (0.005 sec)

MariaDB [477_vehicle_parking]> DELIMITER ;
MariaDB [477_vehicle_parking]> SET FOREIGN_KEY_CHECKS=0;
Query OK, 0 rows affected (0.000 sec)

MariaDB [477_vehicle_parking]> DELETE FROM tbl_parking_slot WHERE parking_slot_id=22;
Query OK, 1 row affected (0.005 sec)

MariaDB [477_vehicle_parking]> SELECT * FROM DEL_parking_slot
    -> ;
+------------+-------------+------------+---------+----------------+---------+
| booking_id | customer_id | vehicle_id | slot_id | booking_status | user_id |
+------------+-------------+------------+---------+----------------+---------+
|        998 |        1001 |       2382 |      22 |              1 |   63902 |
+------------+-------------+------------+---------+----------------+---------+
1 row in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

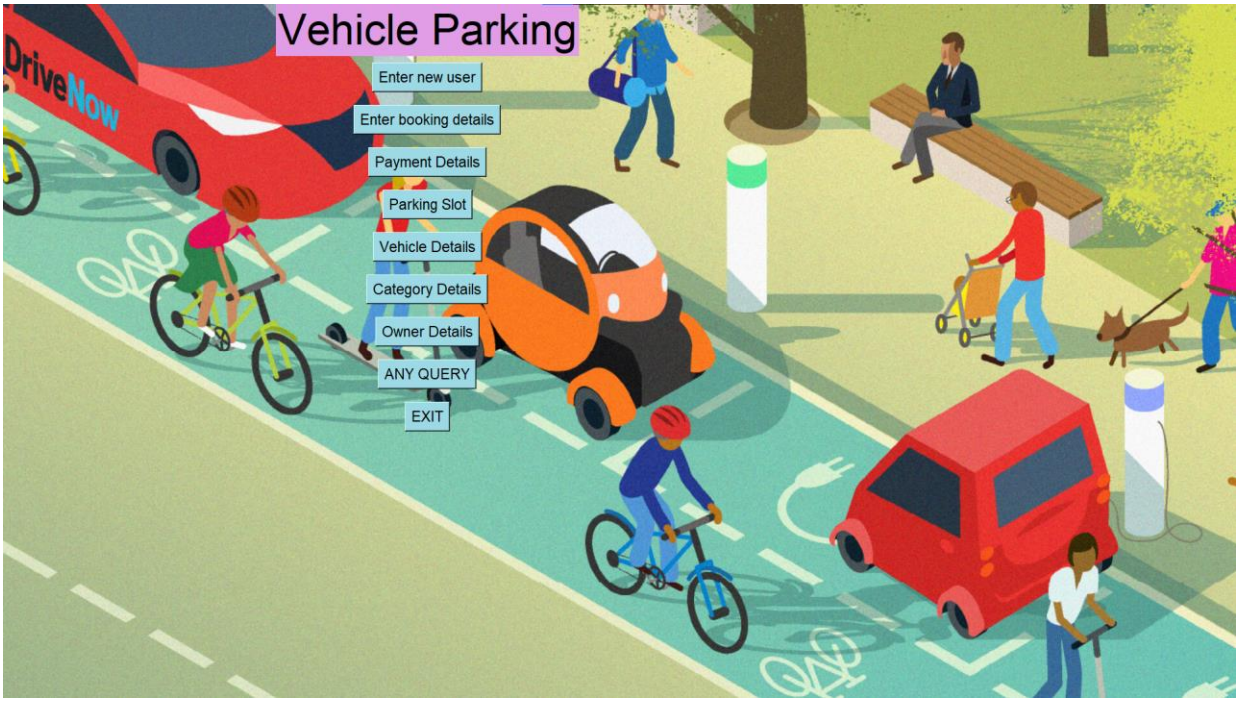
Cursor for getting the total number of empty slots

```
MariaDB [477_vehicle_parking]> DELIMITER $$
MariaDB [477_vehicle_parking]> CREATE PROCEDURE total_empty(IN emp int, OUT count int)
    -> BEGIN
    -> DECLARE done INT DEFAULT FALSE;
    -> DECLARE cur1 CURSOR FOR SELECT count(*) FROM tbl_parking_slot where parking_slot_status=emp;
    -> DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;
    -> OPEN cur1;
    -> read_loop: LOOP
    -> FETCH cur1 INTO count;
    -> IF done THEN
    -> LEAVE read_loop;
    -> END IF;
    -> END LOOP;
    -> CLOSE cur1;
    -> END $$
Query OK, 0 rows affected (0.004 sec)

MariaDB [477_vehicle_parking]> DELIMITER ;
MariaDB [477_vehicle_parking]> CALL total_empty(0,@A);
Query OK, 0 rows affected (0.001 sec)

MariaDB [477_vehicle_parking]> SELECT @A;
+------+
| @A   |
+------+
|    2 |
+------+
1 row in set (0.001 sec)

MariaDB [477_vehicle_parking]>
```

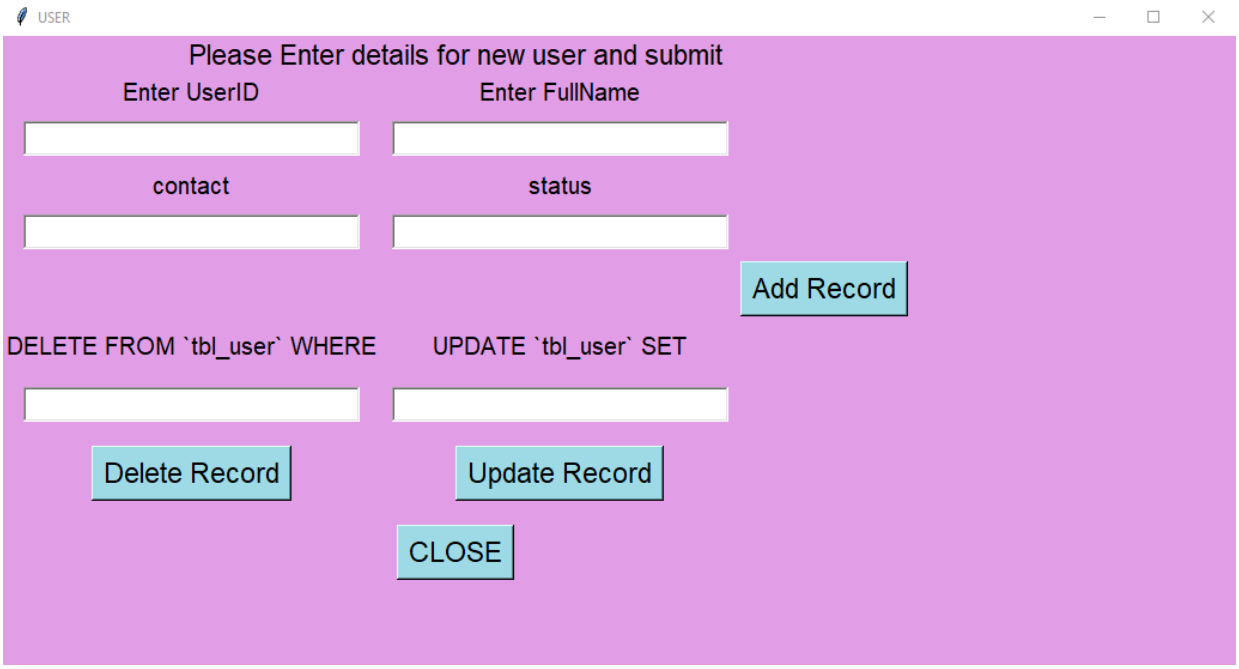
```
MariaDB [477_vehicle_parking]> SELECT *from tbl_parking_slot
    -> ;
+-----------------+---------------------+---------------------+---------+
| parking_slot_id | parking_slot_number | parking_slot_status | user_id |
+-----------------+---------------------+---------------------+---------+
|              20 |                  14 |                   1 |   69892 |
|              21 |                  16 |                   0 |       0 |
|              22 |                  17 |                   1 |   63902 |
|              23 |                  21 |                   1 |   69322 |
|              24 |                  25 |                   0 |       0 |
+-----------------+---------------------+---------------------+---------+
5 rows in set (0.000 sec)

MariaDB [477_vehicle_parking]>
```

Developing a Frontend

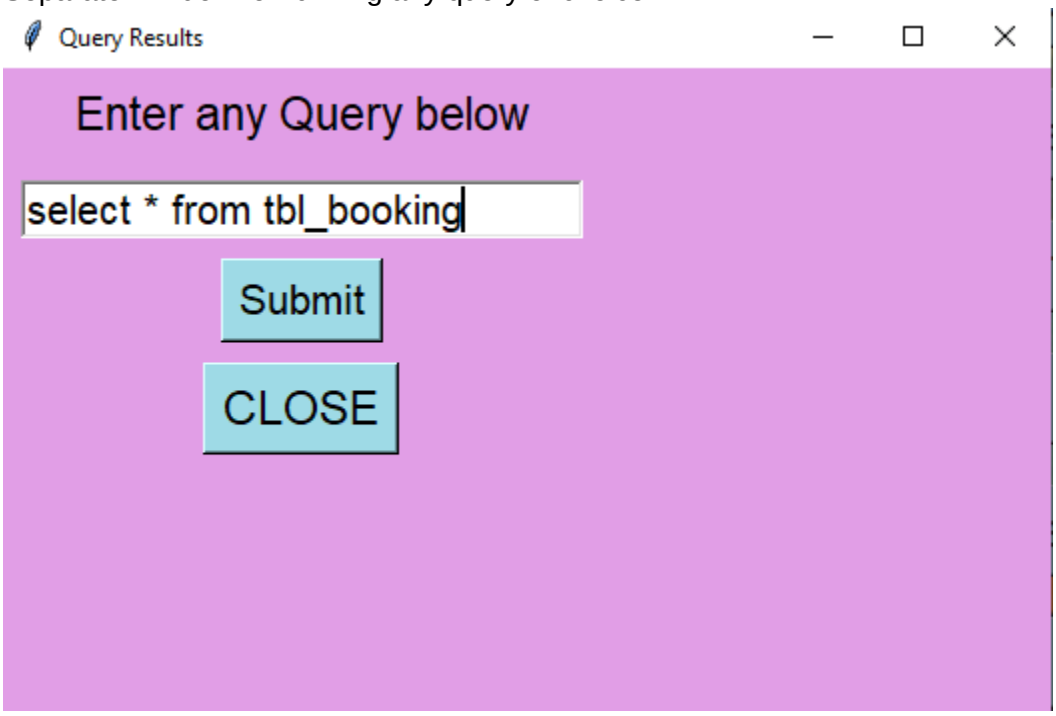
Home page



Separate Window for each table



Separate Window for running any query of choice



Output in a Separate Window for the query

tk

booking_id	customer_id	vehicle_id	slot_id	booking_status	user_id
997	1002	2392	23	1	69322
998	1001	2382	22	1	63902
999	1000	2524	20	1	69892