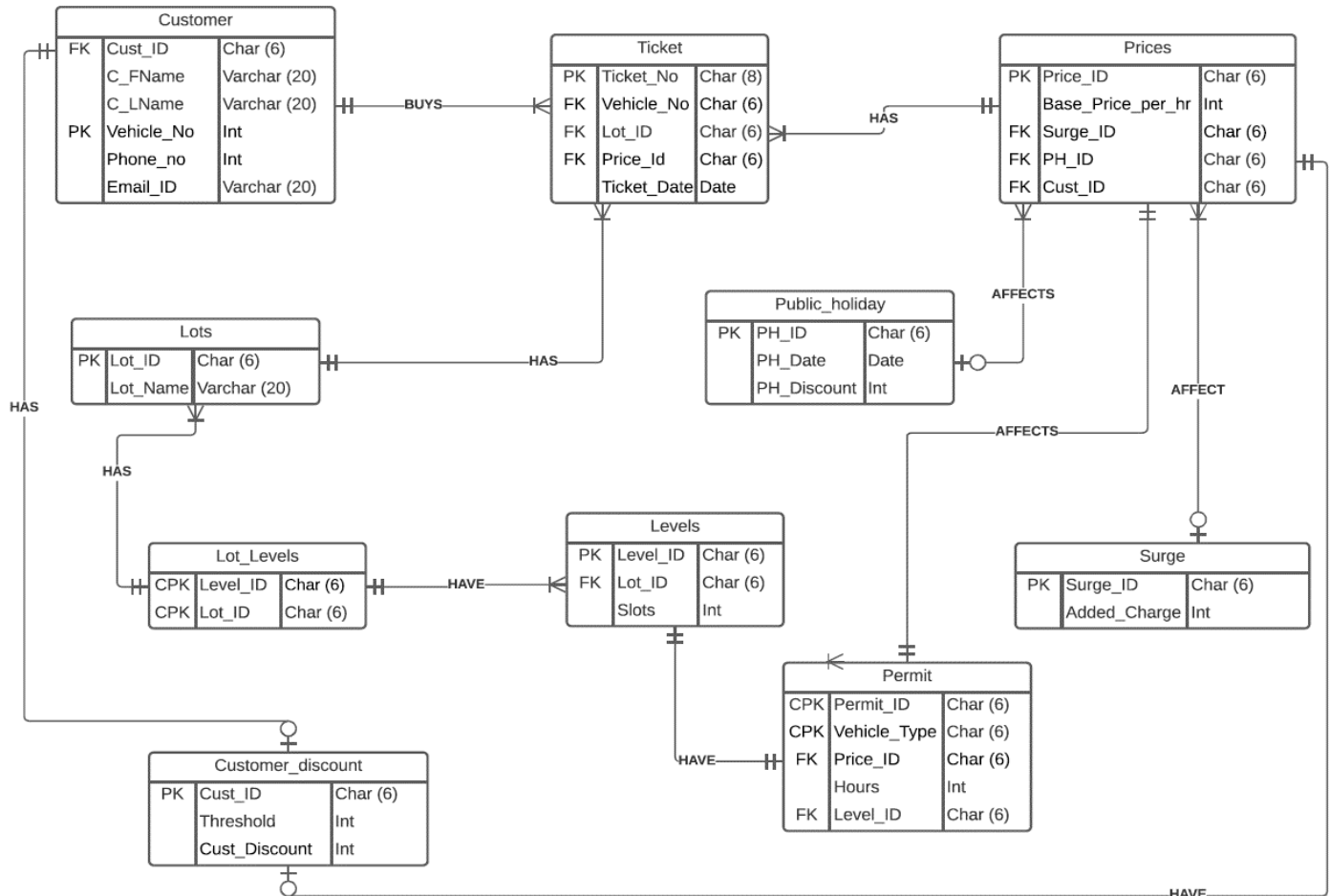


Group Project Airport Traffic Management System

❖ ERD:



create database GPA;
use GPA;

CREATE TABLE Customers(
 VehicleNo varchar(10) NOT NULL,

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```
C_Fname char(20),  
C_Lname char(20),  
CustomerID Int(25),  
PhoneNo int(10),  
Email_ID varchar(25) NOT NULL UNIQUE,  
Primary Key(VehicleNo)
```

```
);
```

```
select * from Customers;
```

Checking Constrains created in the table:

1)

```
INSERT INTO Customers VALUES('ACB123',NULL,'Smith',1,469920464,'adam.smith@gmail.com');
```

The screenshot shows a database query execution interface. At the top, the query `select * from Customers` is entered. Below the query bar, there is a toolbar with icons for search, lock, trash, undo, redo, and a play button. The status bar shows "Cost: 2ms" and "Total 1". The main area displays the execution result: "EXECUTE SUCCESS:" followed by the executed query `INSERT INTO Customers VALUES('ACB123',NULL,'Smith',1,469920464,'adam.smith@gmail.com')` and "AffectedRows : 1". Below this, a table view of the Customers table is shown with columns: VehicleNo, C_Fname, C_Lname, CustomerID, PhoneNo (int), and Email_ID. The table has one row with the values: 1, ACB123, (NULL), Smith, 1, 469920464, and adam.smith@gmail.com.

	VehicleNo	C_Fname	C_Lname	CustomerID	PhoneNo int	Email_ID
1	ACB123	(NULL)	Smith	1	469920464	adam.smith@gmail.com

As we can see that since First Name in Customers table doesn't have 'NOT NULL' stated, we can insert null Values to the FIELD








2)

```
INSERT INTO Customers VALUES(NULL,'Jack','Griffin',2,469920462,'jg@gmail.com');
```

As we can see that since VehicleNo is stated to be as a "NOT NULL" field, we cannot enter a NULL value - it throws an error which is expected:

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```
INSERT INTO Customers VALUES(NULL,'Jack','Griffin',2,469920462,'jg@gmail.com')
```

Input To Search Data        Cost: 2ms < 1 > Total 1

EXECUTE FAIL:

```
INSERT INTO Customers VALUES(NULL,'Jack','Griffin',2,469920462,'jg@gmail.com')
```

Message :








Column 'VehicleNo' cannot be null

	VehicleNo	C_Fname	C_Lname	CustomerID	PhoneNo int	Email_ID	
	Filter	Filter	Filter	Filter	Filter	Filter	
<input type="checkbox"/>	1	ACB123	(NULL)	Smith	1	469920464	adam.smith@gmail.com

3)

When you try to insert another customer value who has the same email address as an already existing customers email address (which has a Not Null and a Unique constraint), it throws an error which is expected.

```
INSERT INTO Customers VALUES('ABC125','Adam','Smithy',2,469920461,'adam.smith@gmail.com')
```

Input To Search Data        Cost: 2ms < 1 > Total 1

EXECUTE FAIL:

```
INSERT INTO Customers VALUES('ABC125','Adam','Smithy',2,469920461,'adam.smith@gmail.com')
```

Message :

Duplicate entry 'adam.smith@gmail.com' for key 'customers.Email_ID'

	VehicleNo	C_Fname	C_Lname	CustomerID	PhoneNo int	Email_ID	
	Filter	Filter	Filter	Filter	Filter	Filter	
<input type="checkbox"/>	1	ACB123	(NULL)	Smith	1	469920464	adam.smith@gmail.com

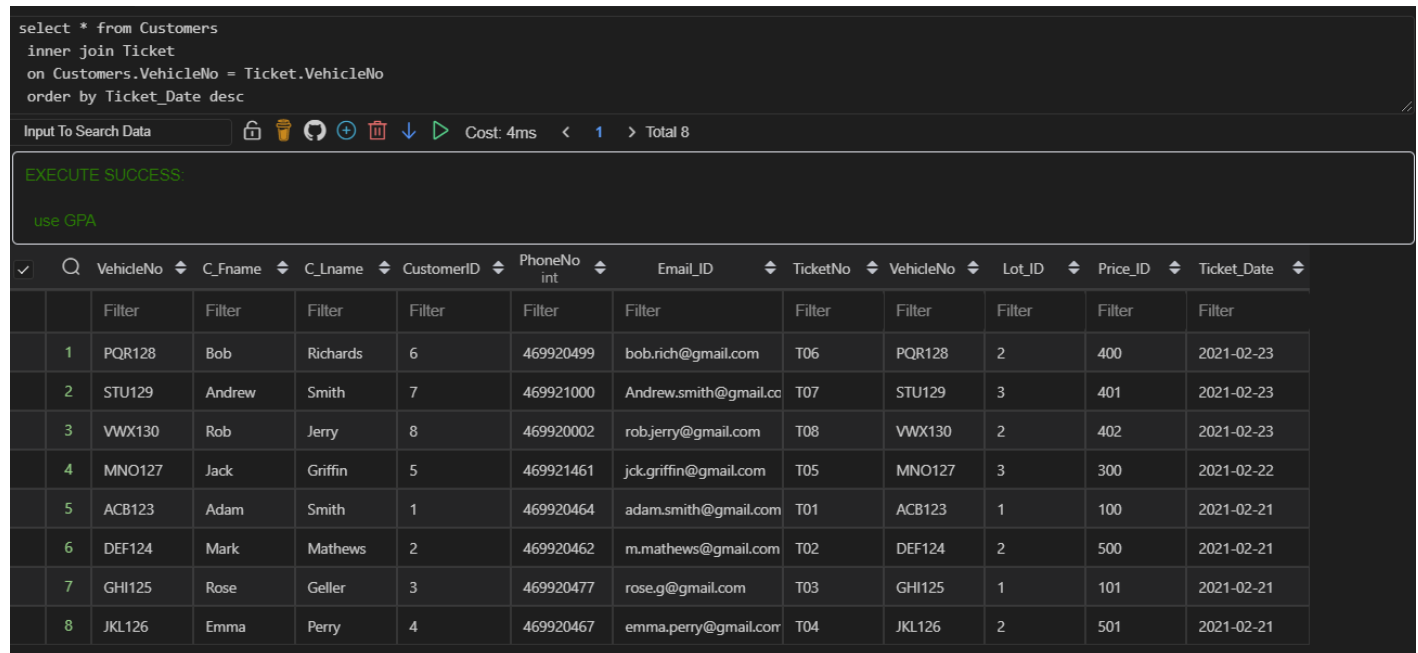
❖ Inner Join:

select only those customers who have bought tickets and display their order details
by their order date in a descending order

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Query:

```
select * from Customers
inner join Ticket
on Customers.VehicleNo = Ticket.VehicleNo
order by Ticket_Date desc;
```



The screenshot shows a SQL query execution interface. The query is: `select * from Customers inner join Ticket on Customers.VehicleNo = Ticket.VehicleNo order by Ticket_Date desc`. The execution status is "EXECUTE SUCCESS" with a "Cost: 4ms" and "Total 8" rows. Below the status, there is a table with 13 columns: VehicleNo, C_Fname, C_Lname, CustomerID, PhoneNo, Email_ID, TicketNo, VehicleNo, Lot_ID, Price_ID, and Ticket_Date. The table contains 8 rows of data, sorted by Ticket_Date in descending order.

	VehicleNo	C_Fname	C_Lname	CustomerID	PhoneNo	Email_ID	TicketNo	VehicleNo	Lot_ID	Price_ID	Ticket_Date
1	PQR128	Bob	Richards	6	469920499	bob.rich@gmail.com	T06	PQR128	2	400	2021-02-23
2	STU129	Andrew	Smith	7	469921000	Andrew.smith@gmail.cc	T07	STU129	3	401	2021-02-23
3	VWX130	Rob	Jerry	8	469920002	rob.jerry@gmail.com	T08	VWX130	2	402	2021-02-23
4	MNO127	Jack	Griffin	5	469921461	jck.griffin@gmail.com	T05	MNO127	3	300	2021-02-22
5	ACB123	Adam	Smith	1	469920464	adam.smith@gmail.com	T01	ACB123	1	100	2021-02-21
6	DEF124	Mark	Mathews	2	469920462	m.mathews@gmail.com	T02	DEF124	2	500	2021-02-21
7	GHI125	Rose	Geller	3	469920477	rose.g@gmail.com	T03	GHI125	1	101	2021-02-21
8	JKL126	Emma	Perry	4	469920467	emma.perry@gmail.com	T04	JKL126	2	501	2021-02-21

❖ Left Join/Left Outer Join:








Display the TicketNo, VehileNo, Lot_ID, Ticket_Date from Ticket table and Customer name and email from Customers table who have parked at lot 2:

Query:

```
select Ticket.TicketNo, Ticket.VehicleNo, Ticket.Lot_ID, Ticket.Ticket_Date, Customers.C_Fname,
Customers.C_Lname, Customers.Email_ID
from Ticket left join Customers
on Ticket.VehicleNo = Customers.VehicleNo
where Ticket.Lot_ID = 2;
```

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```
select Ticket.TicketNo, Ticket.VehicleNo, Ticket.Lot_ID, Ticket.Ticket_Date, Customers.C_Fname,
Customers.C_Lname, Customers.Email_ID
from Ticket left join Customers
on Ticket.VehicleNo = Customers.VehicleNo
where Ticket.Lot_ID = 2
```

Input To Search Data        Cost: 8ms < 1 > Total 4

EXECUTE SUCCESS:

use GPA

<input checked="" type="checkbox"/>	Q	TicketNo	VehicleNo	Lot_ID	Ticket_Date	C_Fname	C_Lname	Email_ID
		Filter	Filter	Filter	Filter	Filter	Filter	Filter
	1	T02	DEF124	2	2021-02-21	Mark	Mathews	m.mathews@gmail.com
	2	T04	JKL126	2	2021-02-21	Emma	Perry	emma.perry@gmail.com
	3	T06	PQR128	2	2021-02-23	Bob	Richards	bob.rich@gmail.com
	4	T08	VWX130	2	2021-02-23	Rob	Jerry	rob.jerry@gmail.com

❖ Right Join/Right Outer Join:

Display the First name, Last Name and Customer Phone No from Customers table and thier respective order details such as OrderID and Price and also display it in decending order of price:

Query:

```
select Customers.C_Fname, Customers.C_Lname, Customers.Email_ID, Ticket.TicketNo, Ticket.VehicleNo,
Ticket.Ticket_Date
from Customers right join Ticket
on Customers.VehicleNo = Ticket.VehicleNo
order by Ticket.Ticket_Date desc;
```

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```
select Customers.First_name, Customers.Last_name, Customers.PhoneNo, Orders.OrderID, Orders.MemberID, Orders.ProductID, Orders.Price
from Customers right join Orders
on Customers.MemberID = Orders.MemberID
order by Orders.Price desc
```

Input To Search Data							
Cost: 2ms	< 1	> Total 11					
First_name	Last_name	PhoneNo	OrderID	MemberID	ProductID	Price	
1	Jack	Griffin	469920464	2	M01	P02	5
2	Sean	Tait	469959990	5	M04	P05	5
3	Sean	Tait	469959990	6	M04	P06	5
4	Bruce	William	480959812	7	M05	P07	5
5	Jack	Griffin	469920464	1	M01	P01	4
6	Luis	Bert	469465998	3	M02	P03	4
7	Bruce	William	480959812	8	M05	P08	3
8	Bruce	William	480959812	9	M05	P09	3
9	Bruce	William	480959812	10	M05	P10	2
10	Bob	Richards	469569650	11	M06	P11	2
11	Sam	William	469860916	4	M03	P04	2

❖ Full Outer Join/ Full Join/ Outer Join:

Write a select statement which returns customer name, Email, Ticket_No, Vehicle_No, Lot_ID, Ticket_Date where customers who have received tickets and Customers who is yet to receive a ticket or rather be allocated one:

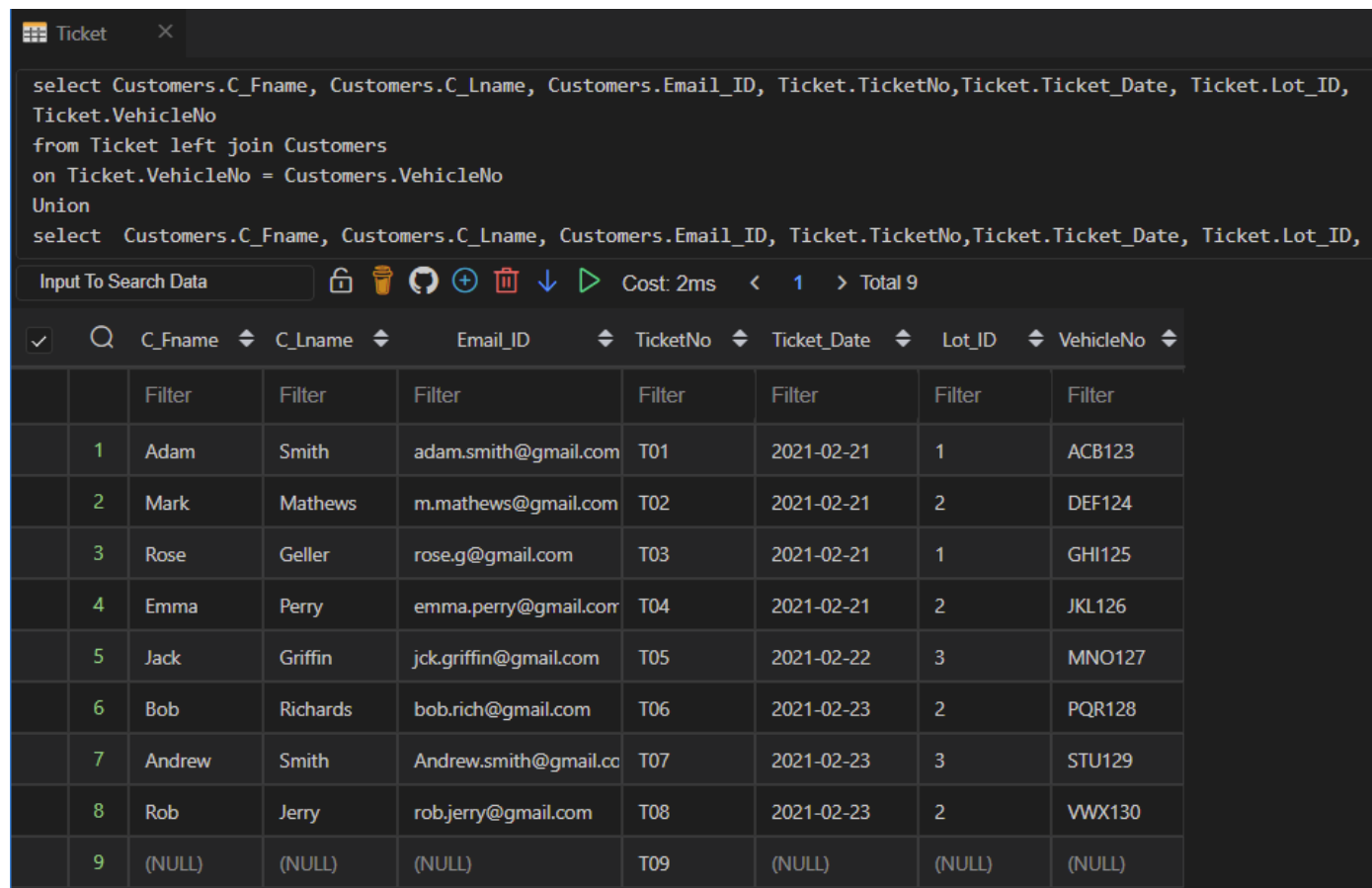
Note: for better understanding we have added a Ticket in the Ticket table which has NULL value which is currently TEMPORARY and needs to be allotted for a customer.

Query:

```
INSERT INTO Ticket VALUES('T09',NULL,NULL,NULL,NULL);
select Customers.C_Fname, Customers.C_Lname, Customers.Email_ID, Ticket.TicketNo,Ticket.Ticket_Date,
Ticket.Lot_ID,
Ticket.VehicleNo
from Ticket left join Customers
on Ticket.VehicleNo = Customers.VehicleNo
Union
```

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```
select Customers.C_Fname, Customers.C_Lname, Customers.Email_ID, Ticket.TicketNo, Ticket.Ticket_Date,
Ticket.Lot_ID,
Ticket.VehicleNo
from Customers right join Ticket
on Customers.VehicleNo = Ticket.VehicleNo;
```



The screenshot shows a SQL query editor window titled "Ticket". The query is a right join between the "Customers" and "Ticket" tables on the "VehicleNo" column. The query is displayed in a dark-themed editor. Below the query, there is a toolbar with various icons for editing and execution. The results of the query are shown in a table with 9 rows and 9 columns. The columns are: a checkbox, a search icon, "C_Fname", "C_Lname", "Email_ID", "TicketNo", "Ticket_Date", "Lot_ID", and "VehicleNo". The first 8 rows contain data for customers Adam Smith, Mark Mathews, Rose Geller, Emma Perry, Jack Griffin, Bob Richards, Andrew Smith, and Rob Jerry. The 9th row contains NULL values for the first 8 columns. The table has a light gray background with dark text.

```
select Customers.C_Fname, Customers.C_Lname, Customers.Email_ID, Ticket.TicketNo, Ticket.Ticket_Date, Ticket.Lot_ID,
Ticket.VehicleNo
from Ticket left join Customers
on Ticket.VehicleNo = Customers.VehicleNo
Union
select Customers.C_Fname, Customers.C_Lname, Customers.Email_ID, Ticket.TicketNo, Ticket.Ticket_Date, Ticket.Lot_ID,
```

Input To Search Data

Cost: 2ms < 1 > Total 9

		C_Fname	C_Lname	Email_ID	TicketNo	Ticket_Date	Lot_ID	VehicleNo
		Filter	Filter	Filter	Filter	Filter	Filter	Filter
1		Adam	Smith	adam.smith@gmail.com	T01	2021-02-21	1	ACB123
2		Mark	Mathews	m.mathews@gmail.com	T02	2021-02-21	2	DEF124
3		Rose	Geller	rose.g@gmail.com	T03	2021-02-21	1	GHI125
4		Emma	Perry	emma.perry@gmail.com	T04	2021-02-21	2	JKL126
5		Jack	Griffin	jck.griffin@gmail.com	T05	2021-02-22	3	MNO127
6		Bob	Richards	bob.rich@gmail.com	T06	2021-02-23	2	PQR128
7		Andrew	Smith	Andrew.smith@gmail.co	T07	2021-02-23	3	STU129
8		Rob	Jerry	rob.jerry@gmail.com	T08	2021-02-23	2	VWX130
9		(NULL)	(NULL)	(NULL)	T09	(NULL)	(NULL)	(NULL)

Removing the NULL valued Order as this is not compatible with Our logic of the ERD. We had just added to show the importance of Outer Join/ Full outer join

Query:

delete from Ticket where TicketNo = 'T09';

❖ **Intersect statement:**

Select all the Customers who have been issued ticket between 21 Feb and 22 Feb of year 2021

Note: as MySql does not support INTERSECT keyword, hence IN operator is used:

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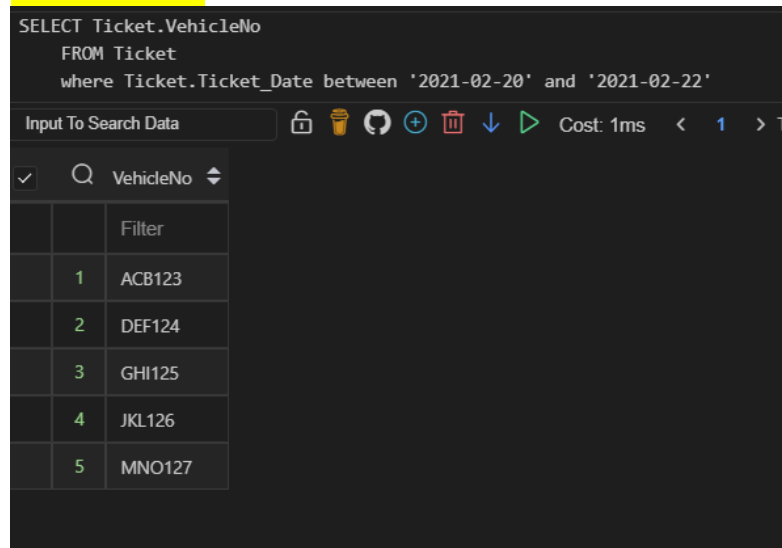
Query:

```
SELECT *  
FROM Customers  
WHERE Customers.VehicleNo IN  
  (SELECT Ticket.VehicleNo  
   FROM Ticket  
   where Ticket.Ticket_Date between '2021-02-21' and '2021-02-22'  
  );
```

For Reference:

```
SELECT Ticket.VehicleNo  
FROM Ticket  
where Ticket.Ticket_Date between '2021-02-20' and '2021-02-22';
```

For Reference:



The screenshot shows a SQL query execution interface. The query is: `SELECT Ticket.VehicleNo FROM Ticket where Ticket.Ticket_Date between '2021-02-20' and '2021-02-22'`. The results are displayed in a table with 5 rows and 2 columns. The first column is a green index number, and the second column is the vehicle number. The results are: 1 ACB123, 2 DEF124, 3 GHI125, 4 JKL126, 5 MNO127.

	Filter
1	ACB123
2	DEF124
3	GHI125
4	JKL126
5	MNO127

Output:

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```
SELECT *
FROM Customers
WHERE Customers.VehicleNo IN
(SELECT Ticket.VehicleNo
FROM Ticket
where Ticket.Ticket_Date between '2021-02-21' and '2021-02-22')
```

🔒
🗑️
🔄
⊕
🗑️
↓
▶️
Cost: 1ms
< 1 >
Total 5

<input checked="" type="checkbox"/>	🔍	VehicleNo	⬆️	C_Fname	⬆️	C_Lname	⬆️	CustomerID	⬆️	PhoneNo int	⬆️	Email_ID	⬆️
		Filter		Filter		Filter		Filter		Filter		Filter	
	1	ACB123		Adam		Smith		1		469920464		adam.smith@gmail.com	
	2	DEF124		Mark		Mathews		2		469920462		m.mathews@gmail.com	
	3	GHI125		Rose		Geller		3		469920477		rose.g@gmail.com	
	4	JKL126		Emma		Perry		4		469920467		emma.perry@gmail.com	
	5	MNO127		Jack		Griffin		5		469921461		jck.griffin@gmail.com	

Union does not have duplicates while Union all does give out duplicates

Union is used to combine multiple select statements, but it only displays the distinct values however, Union all displays the duplicates as well

❖ **UNION:**

select all the distinct customers with who have parked their vehicle at Lot_ID = 2 and who don't have Last Name as Smith:








Query:

```
select Customers.VehicleNo from Customers
where Customers.C_Lname not like 'Smith'
UNION
select Ticket.VehicleNo from Ticket
where Ticket.Lot_ID = 2;
```

For Reference:

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```
select * from Ticket
where Ticket.Lot_ID = 2
```

Input To Search Data        Cost: 2ms

< 1 > Total 4

		Filter	Filter	Filter	Filter	Filter
	1	T02	DEF124	2	500	2021-02-21
	2	T04	JKL126	2	501	2021-02-21
	3	T06	PQR128	2	400	2021-02-23
	4	T08	VWX130	2	402	2021-02-23

```
select * from Customers
where Customers.C_Lname not like 'Smith'
```

Input To Search Data        Cost: 2ms < 1 > Total 6

		Filter	Filter	Filter	Filter	Filter	Filter
<input type="checkbox"/>	1	DEF124	Mark	Mathews	2	469920462	m.mathews@gmail.com
<input type="checkbox"/>	2	GHI125	Rose	Geller	3	469920477	rose.g@gmail.com
<input type="checkbox"/>	3	JKL126	Emma	Perry	4	469920467	emma.perry@gmail.com
<input type="checkbox"/>	4	MNO127	Jack	Griffin	5	469921461	jck.griffin@gmail.com
<input type="checkbox"/>	5	PQR128	Bob	Richards	6	469920499	bob.rich@gmail.com
<input type="checkbox"/>	6	VWX130	Rob	Jerry	8	469920002	rob.jerry@gmail.com

Output:

Aadithya Vidyasagar, Siddharth Sheth, Mounika Arekapudi, Sanath Hanumanthrao Patil
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shp200008@utdallas.edu

```
select Customers.VehicleNo from Customers
where Customers.C_Lname not like 'Smith'
UNION
select Ticket.VehicleNo from Ticket
where Ticket.Lot_ID = 2
```

Input To Search Data

VehicleNo

	Filter
1	DEF124
2	GHI125
3	JKL126
4	MNO127
5	PQR128
6	VWX130

❖ Except Statement:

Select all the Customers who have not placed any orders at all:

Query:

```
select Customers.MemberID from customers
where Customers.MemberID
not in(select Orders.MemberID from Orders);
```

For Reference:

```
select Ticket.VehicleNo from Ticket
where Ticket.Lot_ID = 3
```

Input To Search Data

VehicleNo






	Filter
1	MNO127
2	STU129


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shp200008@utdallas.edu

Output:

```
select Customers.VehicleNo from Customers
where Customers.VehicleNo
not in(

select Ticket.VehicleNo from Ticket
where Ticket.Lot_ID = 3)
```

☒ 

		Filter
	1	ACB123
	2	PQR128
	3	JKL126
	4	DEF124
	5	VWX130
	6	GHI125