



https://www.freepik.com/free-vector/carsharing-service-abstract-concept-illustration_12290946.htm



<https://qr.io>

COREZ Car Rentals



Group 16

Stephen Cornel , Jessica Marie Hernandez

COMP-122 Introduction to Database Systems

Section 013 | Winter 2023

Contents

- Company Requirements
- Entities and Relationships
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https://www.freepik.com/premium-vector/expert-video-about-quality-cars-customers-choose-car-by-rating-video-auto-video-review-test-drive-channel-auto-video-advertising-concept-colorful-vector-illustration_24630196.htm

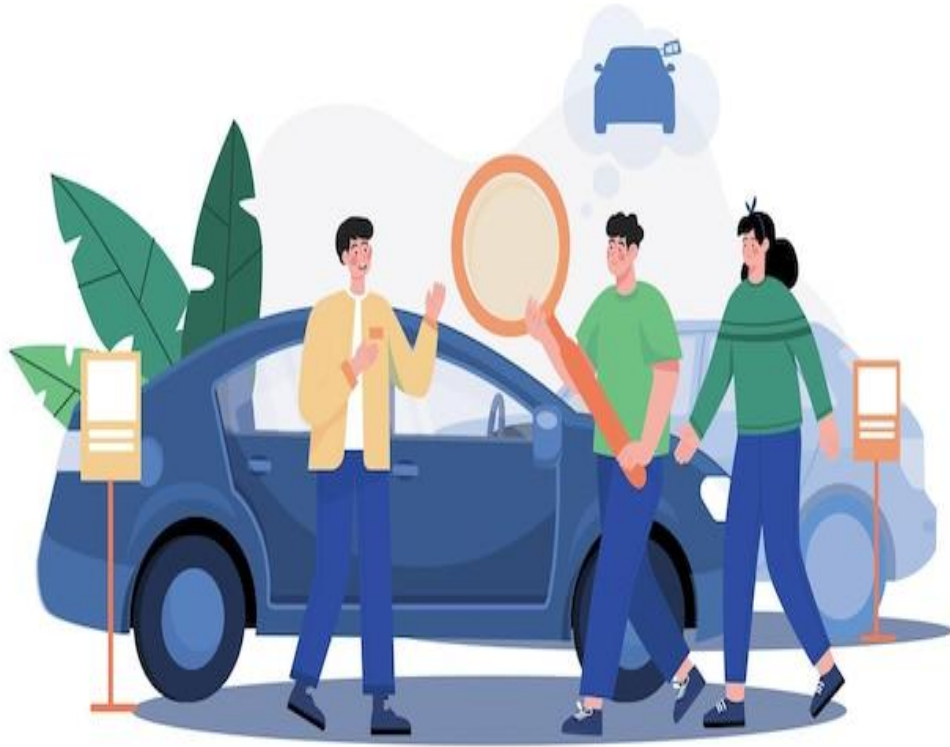
Company Requirements



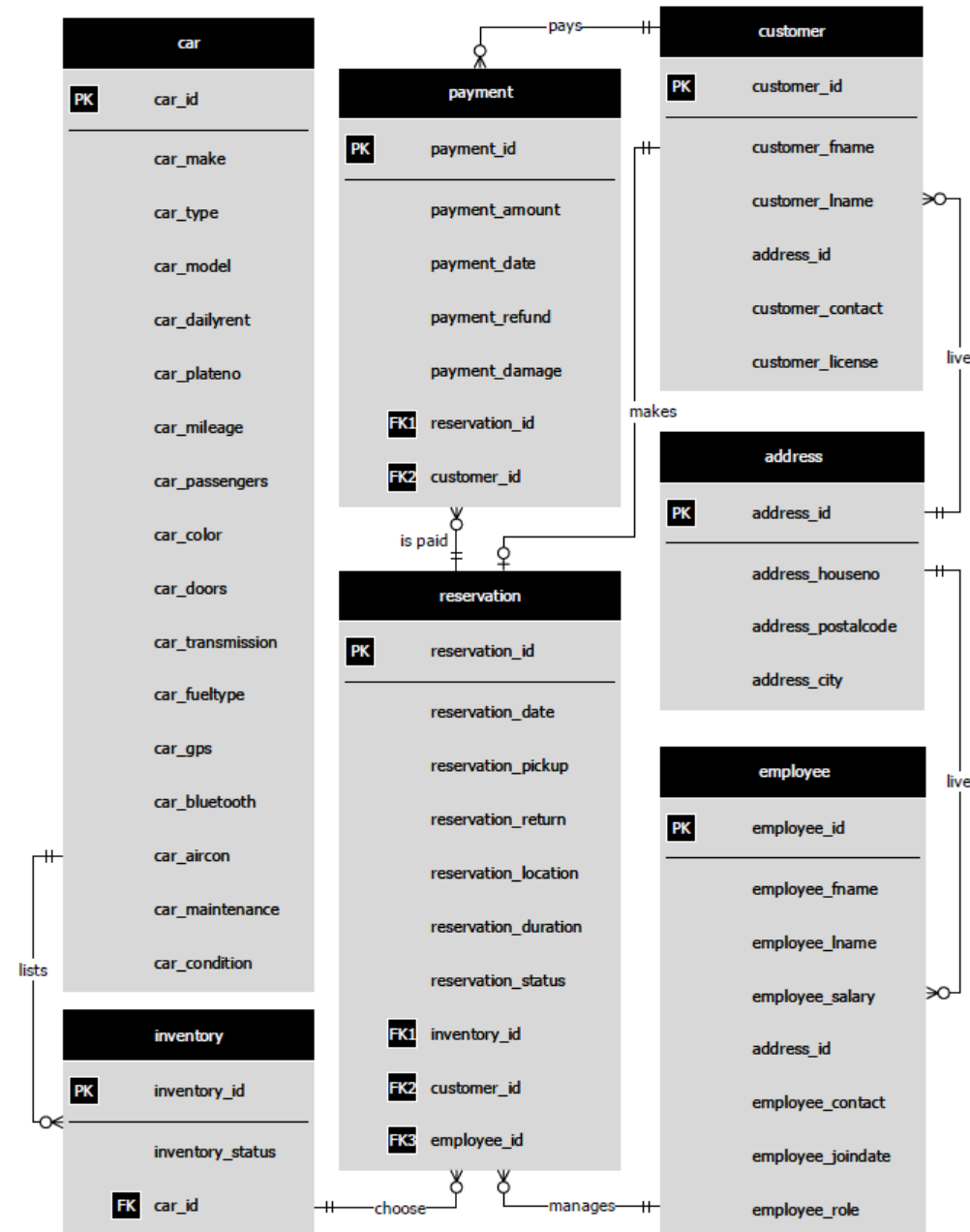
https://www.freepik.com/premium-vector/expert-video-about-quality-cars-customers-choose-car-by-rating-video-auto-video-review-test-drive-channel-auto-video-advertising-concept-colorful-vector-illustration_24630196.htm

System Requirement	Description	Data Requirements
User Management	Users must be able to register, login and manage their account information	employee: id, first name, last name, salary, address, contact number, joined date, role customer: id, first name, last name, address, contact number, driver's license
Car Management	The designated employee should be able to add, delete, and update information about the cars	car: car id, make, type, model, daily rental price, plate number, mileage, passengers, color, doors, transmission, fuel type, GPS, Bluetooth, aircon, maintenance date, condition
Reservation Management	<ul style="list-style-type: none">• Users must be able to select a car from the available inventory, specify rental period, and reserve the car• The designated employee must be able to manage the rental process, change the status and update the rental reservation	inventory: id, status reservation: id, reservation date, pickup date, return date, pick up location, rental duration, status
Payment Management	The system must store payment history of the customers and respective information with their transactions	payment: id, amount, payment method, payment date, refund, damage compensation

Entities and Relationships



https://www.freepik.com/premium-vector/couple-looking-buy-new-car_34942189.htm



Tables: 7
Primary Keys: 7
Foreign Keys: 6
Transaction Tables: 3

Zero or Many

One or Many

Many

One

Zero or One

Database Records

Car Table

car_id	car_make	car_type	car_model	car_dailyrent	car_plateno	car_mileage	car_passengers	car_color	car_doors	car_transmission	car_fueltype	car_gps	car_bluetooth	car_aircon	car_maintenance	car_condition
1	Toyota	Sedan	Camry	\$ 40.00	ABC123	200000	5	Red	4	Automatic	Gasoline	Yes	Yes	Yes	25-Jun-21	Used
2	Honda	SUV	CR-V	\$ 50.00	DEF456	185000	7	Silver	4	Automatic	Gasoline	Yes	Yes	Yes	5-Jul-21	Used
3	Ford	Pickup	F-150	\$ 75.00	GHI789	170000	5	Blue	4	Automatic	Diesel	Yes	Yes	Yes	15-Jul-21	Used
4	Chevrolet	Sedan	Malibu	\$ 40.00	JKL012	155000	5	Green	4	Automatic	Gasoline	Yes	Yes	Yes	25-Jul-21	Used
5	Nissan	SUV	Rogue	\$ 50.00	MNO345	140000	7	Brown	4	Automatic	NA	Yes	Yes	Yes	4-Aug-21	Used
6	Hyundai	Sedan	Sonata	\$ 40.00	PQR678	125000	5	Black	4	Automatic	Gasoline	Yes	Yes	Yes	14-Aug-21	Used
7	Kia	SUV	Sorento	\$ 50.00	STU901	110000	7	White	4	Automatic	Gasoline	Yes	Yes	Yes	24-Aug-21	Used
8	Jeep	Pickup	Gladiator	\$ 75.00	VWX234	95000	5	Orange	4	Automatic	Diesel	Yes	Yes	Yes	3-Sep-21	Used
9	Mazda	Sedan	Mazda6	\$ 40.00	YZA567	80000	5	Purple	4	Automatic	Gasoline	Yes	Yes	Yes	13-Sep-21	Used
10	BMW	SUV	X5	\$ 50.00	ZAB890	65000	7	Gold	4	Automatic	Gasoline	Yes	Yes	Yes	23-Sep-21	Used
11	Mercedes-Benz	Sedan	E-Class	\$ 40.00	CDE123	50000	5	Silver	4	Automatic	Gasoline	Yes	Yes	Yes	3-Oct-21	Used
12	Audi	SUV	Q7	\$ 50.00	EFG456	5000	7	Black	4	Automatic	Gasoline	Yes	Yes	Yes	13-Oct-21	Used
13	Lexus	Pickup	LX570	\$ 75.00	GHI789	5000	5	White	4	Automatic	Diesel	Yes	Yes	Yes	21-Jan-23	New
14	Volkswagen	Sedan	Jetta	\$ 40.00	JKL012	5000	5	Red	4	Automatic	Gasoline	Yes	Yes	Yes	31-Jan-23	New
15	Dodge	SUV	Durango	\$ 50.00	MNO345	5000	7	Blue	4	Automatic	Gasoline	Yes	Yes	Yes	10-Feb-23	New
16	Ram	Pickup	Ram1500	\$ 75.00	PQR678		5	Green	4	Automatic	Diesel	Yes	Yes	Yes		New
17	Mitsubishi	Sedan	Lancer	\$ 40.00	STU901		5	Black	4	Manual	Gasoline	Yes	Yes	Yes		New
18	Land Rover	SUV	Defender 130	\$ 50.00	VWX234		7	White	4	Automatic	Gasoline	Yes	Yes	Yes		New
19	Jaguar	Sedan	XF	\$ 40.00	YZA567		5	Silver	4	Automatic	Gasoline	Yes	Yes	Yes		New
20	Tesla	SUV	Model S	\$ 50.00	ZAB890		7	Black	4	Automatic	NA	Yes	Yes	Yes		New

Employee Table

employee_id	employee_fname	employee_lname	employee_salary	employee_contact	employee_joindate	employee_role	address_id
1	John	Doe	80000	6042844899	25-Jun-21	Manager	1
2	Jane	Smith	64000	7788028824	14-Jul-21	Staff	6
3	Alex	Johnson	55000	7782488524	19-Jul-21	Customer Service	7
4	Emily	Lee	64000	6041328090	01-Aug-21	Staff	2
5	Chris	Kim	55000	6045465049	06-Aug-21	Customer Service	11
6	Avery	Park	55000	7788900630	17-Aug-21	Customer Service	12
7	Cameron	Choi	55000		09-Sep-21		3
8	Ashley	Kim	55000		29-Sep-21		10
9	Tyler	Song	55000	7781320112	05-Oct-21	Customer Service	8
10	Aiden	Chen	80000	6041447135	25-Oct-21	Manager	9
11	Mia	Liu	64000	7781470212	31-Oct-21	Staff	4
12	Ethan	Wang	64000	6046249712	04-Nov-21	Staff	5
13	Aria	Zhao	64000	7785124935	21-Nov-21	Staff	14
14	Luke	Zhang	64000	7784903516	16-Dec-21	Staff	15
15	Lila	Xu	64000	7783711370	14-Jan-22	Staff	13

Database Records

Customer Table

customer_id	customer_fname	customer_lname	customer_contact	customer_license	address_id
1	Alice	Smith	778-123-4567	BC123456789012	16
2	Bob	Johnson	604-987-6543	AB987654321098	17
3	Charlie	Brown	778-555-1234	ON654321098765	18
4	David	Lee	604-111-2222	QC234567890123	19
5	Emma	Davis	778-777-8888	MB345678901234	20
6	Frank	Taylor	604-333-4444	SK456789012345	21
7	Grace	Adams	778-999-0000	NS567890123456	22
8	Henry	Martin	604-555-7777	NB678901234567	23
9	Isabelle	Brown	778-222-3333	PE789012345678	24
10	Jack	Miller	604-777-8888	NL890123456789	25
11	Kelly	Green	778-444-5555	YT901234567890	26
12	Luke	Clark	604-888-9999	NT012345678901	27
13	Mary	Baker	778-666-7777	NU123456789012	28
14	Nathan	Wright	604-222-3333	AB234567890123	29
15	Olivia	Scott	778-888-9999	BC345678901234	30

Inventory Table

inventory_id	inventory_status	car_id
1	Rented	1
2	Rented	2
3	Rented	3
4	Rented	4
5	Rented	5
6	Rented	6
7	Rented	7
8	Rented	8
9	Rented	9
10	Rented	10
11	Available	11
12	Available	12
13	Available	13
14	Available	14
15	Available	15
16	Available	16
17	Available	17
18	Available	18
19	Available	19
20	Available	20

Address Table

address_id	address_houseno	address_postalcode	address_city
1	123 Main St	V6G 1A1	Vancouver
2	456 First Ave	V6K 2H2	Vancouver
3	789 Fourth St	V6M 3J3	Richmond
4		V6Z 1L4	Vancouver
5		V6T 1Z1	Burnaby
6		V6J 5G4	Vancouver
7	1011 Fifth St	V6L 1K5	Richmond
8	1212 Pine St	V6P 3J2	Vancouver
9	1313 Maple Rd	V6S 0C2	Burnaby
10	1414 Birch Ave	V6H 1R9	Vancouver
11	1515 Cedar St	V6N 1J5	Richmond
12	1616 Fir Rd	V6T 2N1	Vancouver
13	1717 Spruce St	V6K 1B4	Burnaby
14	1818 Hemlock Ave	V6J 4J6	Vancouver
15	1919 Holly Rd	V6M 4J7	Richmond
16	2020 Oak St	V6P 4E4	Vancouver
17	2121 Pine Ave	V6S 1Y2	Burnaby
18	2222 Cedar Rd	V6H 3B8	Vancouver
19	2323 Fir St	V6N 3H9	Richmond
20	2424 Spruce Ave	V6T 1W5	Vancouver
21	2525 Elm Rd	V6K 2G9	Vancouver
22	2626 Oak St	V6M 2W8	Richmond
23	2727 Cedar Ave	V6Z 2S7	Vancouver
24	2828 Birch St	V6T 1Y7	Burnaby
25	2929 Holly Rd	V6P 3P4	Vancouver
26	3030 Pine Ave	V6S 2K1	Richmond
27	3131 Fir Rd	V6N 2E3	Vancouver
28	3232 Spruce St	V6H 1L1	Burnaby
29	3333 Hemlock Ave	V6J 3J6	Vancouver
30	3434 Maple Rd	V6K 1P3	Richmond

Database Records

Reservation
Table

reservation_id	reservation_date	reservation_pickup	reservation_return	reservation_location	reservation_duration	reservation_status	inventory_id	customer_id	employee_id
1	01-Feb-23	11-Feb-23	13-Feb-23	Vancouver	2	Approved	1	1	2
2	12-Feb-23	15-Feb-23	17-Feb-23	Richmond	2	Approved	2	2	3
3	24-Feb-23	26-Feb-23	01-Mar-23	Burnaby	3	Approved	3	3	4
4	04-Mar-23	06-Mar-23	14-Mar-23	Vancouver	8	Approved	4	4	5
5	17-Mar-23	18-Mar-23	22-Mar-23	Richmond	4	Approved	5	5	6
6	15-Feb-23	20-May-23	28-May-23	Vancouver	8	Approved	1	6	2
7	23-Feb-23	22-May-23	31-May-23	Richmond	9	Approved	2	7	3
8	28-Feb-23	25-May-23	29-May-23	Burnaby	4	Approved	3	8	4
9	14-Mar-23	25-May-23	01-Jun-23	Vancouver	7	Approved	4	9	5
10	17-Mar-23	28-May-23	06-Jun-23	Richmond	9	Approved	5	10	6
11	24-Feb-23	30-May-23	08-Jun-23	Burnaby	9	Disapproved	6	11	7
12	02-Mar-23	01-Jun-23	10-Jun-23	Vancouver	9	Approved	7	12	8
13	02-Mar-23	02-Jun-23	11-Jun-23	Richmond	9	Disapproved	8	13	9
14	25-Mar-23	03-Jun-23	06-Jun-23	Burnaby	3	Pending	9	14	11
15	27-Mar-23	05-Jun-23	10-Jun-23	Vancouver	5	Pending	10	15	12

Payment
Table

payment_id	payment_amount	payment_date	payment_refund	payment_damage	reservation_id	customer_id
1	80	01-Feb-23			1	1
2	100	12-Feb-23			2	2
3	225	24-Feb-23			3	3
4	320	04-Mar-23			4	4
5	200	17-Mar-23			5	5
6	320	15-Feb-23			6	6
7	450	23-Feb-23			7	7
8	300	28-Feb-23			8	8
9	280	14-Mar-23			9	9
10	450	17-Mar-23			10	10
11	360	24-Feb-23			11	11
12	450	02-Mar-23			12	12
13	675	02-Mar-23			13	13
14	120	25-Mar-23			14	14
15	250	27-Mar-23			15	15

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">• Who is the top paying customer and what is his contact number?• Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">• How much is the company's monthly earnings?• Did any customer ever get a refund? How much should the amount be?



Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT customer_id, contact, customer,
total_payment_amount
FROM (
    SELECT c.customer_id AS customer_id,
           c.customer_contact AS contact,
           c.customer_fname || ', ' ||
           c.customer_lname AS customer,
           SUM(p.payment_amount) AS
total_payment_amount
FROM reservation r
JOIN payment p ON r.reservation_id =
p.reservation_id
JOIN customer c ON p.customer_id =
c.customer_id
GROUP BY c.customer_id,
c.customer_contact, c.customer_fname,
c.customer_lname
ORDER BY total_payment_amount DESC
)
WHERE ROWNUM <= 1;
```

CUSTOMER_ID	CONTACT	CUSTOMER	TOTAL_PAYMENT_AMOUNT
13	7786667777	Mary, Baker	675

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT employee_id, employee, join_date,
total_payment_amount
FROM (
SELECT e.employee_id AS employee_id,
      e.employee_joindate AS join_date,
      e.employee_fname || ', ' ||
e.employee_lname AS employee,
      SUM(p.payment_amount) AS
total_payment_amount
FROM reservation r
JOIN payment p ON r.reservation_id =
p.reservation_id
JOIN employee e ON r.employee_id =
e.employee_id
GROUP BY e.employee_id,
e.employee_joindate, e.employee_fname,
e.employee_lname
ORDER BY total_payment_amount DESC
)
WHERE ROWNUM <= 1;
```

EMPLOYEE_ID	EMPLOYEE	JOIN_DATE	TOTAL_PAYMENT_AMOUNT
9	Tyler, Song	05-OCT-21	675

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT c.car_type,
       COUNT(*) AS times_rented,
       MAX(car_mileage) AS max_mileage
FROM reservation r
JOIN inventory i
      ON r.inventory_id = i.inventory_id
JOIN car c
      ON i.car_id = c.car_id
GROUP BY c.car_type
ORDER BY times_rented DESC,
max_mileage DESC
```

CAR_TYPE	TIMES_RENTED	MAX_MILEAGE
Sedan	6	200000
SUV	6	185000
Pickup	3	170000

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT c.car_type,
MAX(r.reservation_date) AS
latest_reservation
FROM reservation r
JOIN inventory i
      ON r.inventory_id = i.inventory_id
JOIN car c
      ON i.car_id = c.car_id
GROUP BY c.car_type
ORDER BY COUNT(*) DESC,
MAX(car_mileage)DESC
```

CAR_TYPE	LATEST_RESERVATION
Sedan	25-MAR-23
SUV	27-MAR-23
Pickup	02-MAR-23

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT EXTRACT(MONTH FROM
payment_date) AS payment_month,
       EXTRACT(YEAR FROM payment_date)
AS payment_year,
       SUM(payment_amount) AS
total_payment_amount
FROM payment
GROUP BY EXTRACT(MONTH FROM
payment_date), EXTRACT(YEAR FROM
payment_date)
ORDER BY payment_year;
```

PAYMENT_MONTH	PAYMENT_YEAR	TOTAL_PAYMENT_AMOUNT
2	2023	1835
3	2023	2745

Business Inquiries

System Requirement	Business Inquiries
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?
Car management	What type of car is the most rented and what is the maximum mileage?
Reservation management	When was the most rented type of car last reserved?
Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?

```
SELECT c.customer_id,  
c.customer_fname || ', ' ||  
c.customer_lname AS customer,  
r.reservation_date,  
p.payment_date,  
p.payment_amount,  
p.payment_refund  
FROM reservation r  
JOIN payment p ON r.reservation_id =  
p.reservation_id  
JOIN customer c ON p.customer_id =  
c.customer_id  
WHERE r.reservation_status =  
'Disapproved';
```

CUSTOMER_ID	CUSTOMER	RESERVATION_DATE	PAYMENT_DATE	PAYMENT_AMOUNT	PAYMENT_REFUND
11	Kelly, Green	24-FEB-23	24-FEB-23	360	(null)
13	Mary, Baker	02-MAR-23	02-MAR-23	675	(null)

Business Inquiries

System Requirement	Business Inquiries	Answers																											
User management	<ul style="list-style-type: none">Who is the top paying customer and what is his contact number?Which employee processed the most payments and when did he join the team?	<table><tr><th>CUSTOMER_ID</th><th>CONTACT</th><th>CUSTOMER</th><th>TOTAL_PAYMENT_AMOUNT</th></tr><tr><td>13</td><td>7786667777</td><td>Mary, Baker</td><td>675</td></tr></table> <table><tr><th>EMPLOYEE_ID</th><th>EMPLOYEE</th><th>JOIN_DATE</th><th>TOTAL_PAYMENT_AMOUNT</th></tr><tr><td>9</td><td>Tyler, Song</td><td>05-OCT-21</td><td>675</td></tr></table>	CUSTOMER_ID	CONTACT	CUSTOMER	TOTAL_PAYMENT_AMOUNT	13	7786667777	Mary, Baker	675	EMPLOYEE_ID	EMPLOYEE	JOIN_DATE	TOTAL_PAYMENT_AMOUNT	9	Tyler, Song	05-OCT-21	675											
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Car management	What type of car is the most rented and what is the maximum mileage?	<table><tr><th>CAR_TYPE</th><th>TIMES_RENTED</th><th>MAX_MILEAGE</th></tr><tr><td>Sedan</td><td>6</td><td>200000</td></tr><tr><td>SUV</td><td>6</td><td>185000</td></tr><tr><td>Pickup</td><td>3</td><td>170000</td></tr></table>	CAR_TYPE	TIMES_RENTED	MAX_MILEAGE	Sedan	6	200000	SUV	6	185000	Pickup	3	170000															
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Payment management	<ul style="list-style-type: none">How much is the company's monthly earnings?Did any customer ever get a refund? How much should the amount be?	<table><tr><th>PAYMENT_MONTH</th><th>PAYMENT_YEAR</th><th>TOTAL_PAYMENT_AMOUNT</th></tr><tr><td>2</td><td>2023</td><td>1835</td></tr><tr><td>3</td><td>2023</td><td>2745</td></tr></table> <table><tr><th>CUSTOMER_ID</th><th>CUSTOMER</th><th>RESERVATION_DATE</th><th>PAYMENT_DATE</th><th>PAYMENT_AMOUNT</th><th>PAYMENT_REFUND</th></tr><tr><td>11</td><td>Kelly, Green</td><td>24-FEB-23</td><td>24-FEB-23</td><td>360</td><td>(null)</td></tr><tr><td>13</td><td>Mary, Baker</td><td>02-MAR-23</td><td>02-MAR-23</td><td>675</td><td>(null)</td></tr></table>	PAYMENT_MONTH	PAYMENT_YEAR	TOTAL_PAYMENT_AMOUNT	2	2023	1835	3	2023	2745	CUSTOMER_ID	CUSTOMER	RESERVATION_DATE	PAYMENT_DATE	PAYMENT_AMOUNT	PAYMENT_REFUND	11	Kelly, Green	24-FEB-23	24-FEB-23	360	(null)	13	Mary, Baker	02-MAR-23	02-MAR-23	675	(null)
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13	Mary, Baker	02-MAR-23	02-MAR-23	675	(null)																								

Conclusion

The database was able to present data-driven answers to business inquiries.

COREZ Car Rental may utilize this database to:

- ✓ manage users
- ✓ control cars set for rental
- ✓ optimize reservation management
- ✓ track payments

