

Case Study: Car Rental System

Output Screenshots

1) Add a Car

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 1
Enter Car Make: Volkswagen
Enter Car Model: Virtus
Enter Year: 2023
Enter Daily Rate: 70.00
Enter Status (available/notAvailable): available
Enter Passenger Capacity: 5
Enter Engine Capacity: 1.5
Vehicle added successfully! Assigned ID: 224
Car added successfully!
```

	vehide_id	make	model	year	daily_rate	status	passenger_capacity	engine_capacity
	2	Hyundai	i20	2020	40.00	not_available	5	1.40
	3	Kia	Sonet	2020	48.00	available	5	1.00
	4	Mahindra	XUV700	2023	95.00	available	7	2.20
	5	Audi	A4	2021	85.00	available	5	2.00
	6	Renault	Kiger	2021	42.00	available	5	1.00
	7	BMW	X5	2022	100.00	available	7	3.00
	8	Ford	Focus	2021	55.00	not_available	5	2.00
	9	Toyota	Fortuner	2022	90.00	available	7	2.80
	10	Tata	Nexon	2019	50.00	available	5	1.50
	201	Honda	Civic	2022	65.00	available	5	1.80
	207	Tesla	Model 3	2024	45.00	notAvailable	5	2.50
	217	honda	y64	2020	35.00	available	5	1.20
	218	honda	y62	2020	45.00	available	4	5.50
	220	Tesla	Model 3	2024	45.00	Available	5	2.50
	221	Tesla	Model 3	2024	45.00	Available	5	2.50
	222	Tesla	Model 3	2024	45.00	Available	5	2.50
	224	Volkswa...	Virtus	2023	70.00	available	5	1.50

2) Remove a Car

```

===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 2
Enter Car ID to remove: 219
Car removed successfully!

```

8	Ford	Focus	2021	55.00	not_available	5	2.00
9	Toyota	Fortuner	2022	90.00	available	7	2.80
10	Tata	Nexon	2019	50.00	available	5	1.50
201	Honda	Civic	2022	65.00	available	5	1.80
207	Tesla	Model 3	2024	45.00	notAvailable	5	2.50
217	honda	y64	2020	35.00	available	5	1.20
218	honda	y62	2020	45.00	available	4	5.50
220	Tesla	Model 3	2024	45.00	Available	5	2.50
221	Tesla	Model 3	2024	45.00	Available	5	2.50
222	Tesla	Model 3	2024	45.00	Available	5	2.50
224	Volkswa...	Virtus	2023	70.00	available	5	1.50
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

3) List Available cars

```

===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 3

Available Cars:
Vehicle ID: 1, Make: Maruti, Model: Swift, Year: 2018, Daily Rate: $35.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.2L
Vehicle ID: 3, Make: Kia, Model: Sonet, Year: 2020, Daily Rate: $48.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.0L
Vehicle ID: 4, Make: Mahindra, Model: XUV700, Year: 2023, Daily Rate: $95.0, Status: available, Passenger Capacity: 7, Engine Capacity: 2.2L
Vehicle ID: 5, Make: Audi, Model: A4, Year: 2021, Daily Rate: $85.0, Status: available, Passenger Capacity: 5, Engine Capacity: 2.0L
Vehicle ID: 6, Make: Renault, Model: Kiger, Year: 2021, Daily Rate: $42.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.0L
Vehicle ID: 7, Make: BMW, Model: X5, Year: 2022, Daily Rate: $100.0, Status: available, Passenger Capacity: 7, Engine Capacity: 3.0L
Vehicle ID: 9, Make: Toyota, Model: Fortuner, Year: 2022, Daily Rate: $90.0, Status: available, Passenger Capacity: 7, Engine Capacity: 2.8L
Vehicle ID: 10, Make: Tata, Model: Nexon, Year: 2019, Daily Rate: $50.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.5L
Vehicle ID: 201, Make: Honda, Model: Civic, Year: 2022, Daily Rate: $65.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.8L
Vehicle ID: 217, Make: honda, Model: y64, Year: 2020, Daily Rate: $35.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.2L
Vehicle ID: 218, Make: honda, Model: y62, Year: 2020, Daily Rate: $45.0, Status: available, Passenger Capacity: 4, Engine Capacity: 5.5L
Vehicle ID: 220, Make: Tesla, Model: Model 3, Year: 2024, Daily Rate: $45.0, Status: Available, Passenger Capacity: 5, Engine Capacity: 2.5L
Vehicle ID: 221, Make: Tesla, Model: Model 3, Year: 2024, Daily Rate: $45.0, Status: Available, Passenger Capacity: 5, Engine Capacity: 2.5L
Vehicle ID: 222, Make: Tesla, Model: Model 3, Year: 2024, Daily Rate: $45.0, Status: Available, Passenger Capacity: 5, Engine Capacity: 2.5L
Vehicle ID: 224, Make: Volkswagen, Model: Virtus, Year: 2023, Daily Rate: $70.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.5L

```

4) Find car by id

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 4
Enter Car ID: 6
Car Found: Vehicle ID: 6, Make: Renault, Model: Kiger, Year: 2021, Daily Rate: $42.0, Status: available, Passenger Capacity: 5, Engine Capacity: 1.0L
```

5) Add Customer

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 5
Enter First Name: Moshina
Enter Last Name: Rahmath
Enter Email: moshina@gmail.com
Enter Phone Number: 6789536789
Customer added successfully!
```

	customer_id	first_name	last_name	email	phone_number
▶	0	Moshina	Rahmath	moshina@gmail.com	6789536789
	101	John	Doe	john.doe@example.com	9876543210
	111	Meera	Jasmine	meera_jas@gmail.com	8774567890
	211	Amaina	Banu	aamina.banu@gmail.com	6787654321
	311	Rakshana	Shre	rakshana@gmail.com	5678978908
	411	Reethiga	Shre	reethi123@gmail.com	8657838299
	511	Senthil	Velan	senthil\$345@gmail.com	98654364876
	611	Ram	kumar	ramkumar@gmail.com	8674845923
	711	Siva	Ranjani	sivaranjani@gmail.com	8895467835
	811	Moshina	Rahmath	moshina24@gmail.com	8957428673
	911	Indhu	Mathi	indhumathi@gmail.com	7343267658
	1011	Syed	Anwar	syedanwar@gmail.com	8899934643
	1500	John	Doe	john.doe1500@exampl...	7894561230
▲	NULL	NULL	NULL	NULL	NULL

6) Remove a Customer

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 6
Enter Customer ID to remove: 1500
Customer removed successfully!
```

	customer_id	first_name	last_name	email	phone_number
▶	0	Moshina	Rahmath	moshina@gmail.com	6789536789
	101	John	Doe	john.doe@example.com	9876543210
	111	Meera	Jasmine	meera_jas@gmail.com	8774567890
	211	Amaina	Banu	aamina.banu@gmail.com	6787654321
	311	Rakshana	Shre	rakshana@gmail.com	5678978908
	411	Reethiga	Shre	reethi123@gmail.com	8657838299
	511	Senthil	Velan	senthil\$345@gmail.com	98654364876
	611	Ram	kumar	ramkumar@gmail.com	8674845923
	711	Siva	Ranjani	sivaranjani@gmail.com	8895467835
	911	Indhu	Mathi	indhumathi@gmail.com	7343267658
	1011	Syed	Anwar	syedanwar@gmail.com	8899934643
*	NULL	NULL	NULL	NULL	NULL

7) Find Customer by id

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 7
Enter Customer ID: 411
Customer Found: -----
Customer ID: 411
Name: Reethiga Shre
Email: reethi123@gmail.com
Phone: 8657838299
-----
```

8) create a lease

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 8
Enter Customer ID: 911
Enter Car ID: 4
Enter Start Date (YYYY-MM-DD): 2025-04-20
Enter End Date (YYYY-MM-DD): 2025-05-20
Lease created successfully! Lease ID: 1029
```

	1009	3	911	2024-06-15	2024-06-15	monthly_lease	0
	1010	10	1011	2024-06-15	2024-07-15	daily_lease	0
▶	1029	4	911	2025-04-20	2025-05-20	Daily	2850
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

9) Return a car

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 9
Enter Lease ID to return car: 1
Car returned successfully!
```

10) View Active Leases

```
===== Car Rental System =====
```

1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit

Enter your choice: 10

Active Leases:

Days between: 30

Total Cost Calculated: \$2850.0

```
-----  
Lease ID      : 1029  
Customer ID   : 911  
Vehicle ID    : 4  
Start Date    : 2025-04-20  
End Date      : 2025-05-20  
Lease Type    : Daily  
Total Cost    : $2850.0  
-----
```

11) View Lease History

```
Main (1) [Java Application] C:\Users\makiz\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 11

Lease History:
Days between: 10
Total Cost Calculated: $500.0
Days between: 29
Total Cost Calculated: $1450.0
Days between: 9
Total Cost Calculated: $0.0
Days between: 31
Total Cost Calculated: $1000.0
Days between: 6
Total Cost Calculated: $300.0
Days between: 30
Total Cost Calculated: $1000.0
Days between: 14
Total Cost Calculated: $700.0
Days between: 9
Total Cost Calculated: $0.0
Days between: 30
Total Cost Calculated: $1500.0
```

```
Main (1) [Java Application] C:\Users\makiz\p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full\win32
Lease ID      : 1001
Customer ID   : 1
Vehicle ID    : 111
Start Date    : 2024-01-10
End Date      : 2024-01-20
Lease Type    : daily_lease
Total Cost    : $500.0
-----
Lease ID      : 1002
Customer ID   : 2
Vehicle ID    : 211
Start Date    : 2024-02-05
End Date      : 2024-03-05
Lease Type    : daily_lease
Total Cost    : $1450.0
-----
Lease ID      : 1003
Customer ID   : 3
Vehicle ID    : 311
Start Date    : 2024-03-01
End Date      : 2024-03-10
Lease Type    : monthly_lease
Total Cost    : $0.0
-----
Lease ID      : 1004
Customer ID   : 4
Vehicle ID    : 411
Start Date    : 2024-03-15
End Date      : 2024-04-15
Lease Type    : monthly_lease
Total Cost    : $1000.0
```

```
-----  
Lease ID      : 1005  
Customer ID   : 5  
Vehicle ID    : 511  
Start Date    : 2024-04-01  
End Date      : 2024-04-07  
Lease Type    : daily_lease  
Total Cost    : $300.0  
-----  
  
-----  
Lease ID      : 1006  
Customer ID   : 6  
Vehicle ID    : 611  
Start Date    : 2024-04-10  
End Date      : 2024-05-10  
Lease Type    : monthly_lease  
Total Cost    : $1000.0  
-----  
  
-----  
Lease ID      : 1007  
Customer ID   : 7  
Vehicle ID    : 711  
Start Date    : 2024-05-01  
End Date      : 2024-05-15  
Lease Type    : daily_lease  
Total Cost    : $700.0  
-----  
  
-----  
Lease ID      : 1009  
Customer ID   : 9  
Vehicle ID    : 911  
Start Date    : 2024-06-01  
End Date      : 2024-06-10  
Lease Type    : monthly_lease  
Total Cost    : $0.0  
-----  
  
-----  
Lease ID      : 1010  
Customer ID   : 10  
Vehicle ID    : 1011  
Start Date    : 2024-06-15  
End Date      : 2024-07-15  
Lease Type    : daily_lease  
Total Cost    : $1500.0  
-----
```


12) Make Payment

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 12
Enter Lease ID for Payment: 1003
Enter Amount: 4000
Enter Payment Date (YYYY-MM-DD): 2025-04-15
Payment successful!
```

	payment_id	lease_id	payment_date	amount
	206	1006	2024-05-10	13500.00
	207	1007	2024-05-15	6500.00
	209	1009	2024-06-10	4800.00
	210	1010	2024-07-15	18000.00
	302	1002	2025-04-10	2000.00
	303	1003	2025-04-15	4000.00
*	NULL	NULL	NULL	NULL

13) View Payment History

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 13

Payment History:
Payment ID: 201
Lease ID: 1001
Payment Date: 2024-01-20
Amount Paid: $3500.0
Payment ID: 202
Lease ID: 1002
Payment Date: 2024-03-05
Amount Paid: $12000.0
Payment ID: 203
Lease ID: 1003
Payment Date: 2024-03-10
Amount Paid: $4800.0
Payment ID: 204
Lease ID: 1004
Payment Date: 2024-04-15
Amount Paid: $15000.0
```

```

Payment Date: 2024-03-10
Amount Paid: $4800.0
Payment ID: 204
Lease ID: 1004
Payment Date: 2024-04-15
Amount Paid: $15000.0
Payment ID: 205
Lease ID: 1005
Payment Date: 2024-04-07
Amount Paid: $4200.0
Payment ID: 206
Lease ID: 1006
Payment Date: 2024-05-10
Amount Paid: $13500.0
Payment ID: 207
Lease ID: 1007
Payment Date: 2024-05-15
Amount Paid: $6500.0
Payment ID: 209
Lease ID: 1009
Payment Date: 2024-06-10
Amount Paid: $4800.0
Payment ID: 210
Lease ID: 1010
Payment Date: 2024-07-15
Amount Paid: $18000.0
Payment ID: 302
Lease ID: 1002
Payment Date: 2025-04-10
Amount Paid: $2000.0
Payment ID: 303
Lease ID: 1003
Payment Date: 2025-04-15
Amount Paid: $4000.0

```

14) Find Payment by ID

```
===== Car Rental System =====
1. Add a Car
2. Remove a Car
3. List Available Cars
4. Find Car by ID
5. Add a Customer
6. Remove a Customer
7. Find Customer by ID
8. Create a Lease
9. Return a Car
10. View Active Leases
11. View Lease History
12. Make Payment
13. View Payment History
14. Find Payment by ID
15. Exit
Enter your choice: 14
Enter Payment ID: 207
Payment Details:
Payment ID: 207
Lease ID: 1007
Payment Date: 2024-05-15
Amount Paid: $6500.0
```

For Junit

