



# CSCI 43500 Project

## Team

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# Problem Statement

Our system is made to help a transportation/rental business keep track of vehicles and information on the customers who borrowed them. There's been a spike of needing car rentals and this database will help companies keep track of the influx of data. The company will use this database to keep track of what vehicles were lent and who they were lent to. The customer/user who is borrowing the vehicles will provide their license number, name, payment info, home address, the vehicle type / vehicle brand preference. The system will check to see if the customer's desired vehicle is available or not. It will do this by checking the database. If the car is not taken he will be permitted to borrow the vehicle. This database will benefit both the customer and the company. The customer will know which vehicle is available and the company will be well organized.

# Attribute Catalogue

Attributes:		Name for DB	Table Category	PK	Foreign Key	Table key association	Attribute Type	Domain	Repeating Group	Atomic
License Number		license_no	Contact	yes	Don't know	Contact	int	123 456 789	No	yes
Name		name	Contact		Don't know		varchar(32)	Justin	No	yes
Address		address	Contact		Don't know		varchar(32)	695 Park Ave, New York, NY 10065	No	
(In reality, this is not atomic but we will consider these atomic)	Street	street_address	Contact		Don't know		varchar(32)	695 Park Ave	No	yes
	City	city_address	Contact		Don't know		varchar(32)	New York		
	State	state_address	Contact		Don't know		varchar(32)	New York		
	Zip	zip_address	Contact		Don't know		varchar(32)	10065		
Payment		payment	Orders		Don't know		varchar(64)	123456789;Justin	Yes	yes
	Payment Number	payment_mthd	Orders		Don't know		varchar(32)	123456789	Yes	
	Payer Name	payer	Orders		Don't know		varchar(4)	Justin	Yes	
	Paid	paid	Orders		Don't know		varchar(12)	yes	no	yes
Available		available	Orders		Don't know		varchar(12)	yes	no	
Date		dates	Orders		Don't know		varchar(32)	1/1/2001	No	yes
Vehicle Type		vehicle_type	Vehicle		Don't Know		varchar(32)	SUV	No	yes
Vehicle Brand		vehicle_brand	Vehicle		Don't Know		varchar(32)	Honda	No	yes

# Project\_Data\_Raw (Pre Normalization)

```
mysql> select * from project_data_raw;
```

name	license_no	address	payment	paid	date	available	vehicle_type	vehicle_brand
Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-7777-2915	yes	0/2/2018	yes	Limo	Cadillac
oudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-7777-2915	yes	0/6/2018	no	Truck	Toyota
aul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-7492-6649	yes	1/31/2001	no	SUV	Honda
mond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-9690-3059	yes	3/9/2002	yes	Limo	Cadillac
y Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-7426-7172	yes	2/11/2017	yes	Motorcycle	Yamaha
ryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-7567-1429	yes	4/3/2005	yes	Truck	Toyota
oo	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067	yes	4/23/2005	yes	Van	Ford
Too	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067	yes	9/2/2003	no	Motorcycle	Yamaha
Wade	150122847	860 W. Maiden Drive Sacramento, CA 95820	4929-9802-6022-9058	yes	11/27/2009	no	SUV	Honda
n Love	244316439	9660 Buckingham Ave. Southfield, MI 48076	8167-5393-2456-3011	yes	3/13/2005	no	Limo	Cadillac
l	909002906	28 Beacon Street Coatesville, PA 19320	3229-6373-3421-2919	yes	5/14/2022	no	Van	Ford
arden	933110198	86 Greystone Ave. Grand Island, NE 68801	8537-6198-3324-3315	yes	10/31/2022	no	SUV	Honda
i Leonard	977648524	8684 Grandrose Dr. Sterling Heights, MI 48310	4413-7526-1091-1980	yes	12/6/2015	no	Limo	Cadillac
Durant	58657202	362 W. Hill Field Ave. Monroe, NY 10950	1873-8862-7170-8996	yes	4/23/2008	yes	Motorcycle	Yamaha
n Durant	58657202	362 W. Hill Field Ave. Monroe, NY 10950	1873-8862-7170-8996	yes	5/23/2008	no	Limo	Cadillac
k Rose	65103350	740 Bow Ridge Court Phoenix, AZ 85021	8305-3925-3084-4327	yes	5/3/2011	yes	Motorcycle	Yamaha
estbrook	307565986	23 Alton Street Kalispell, MT 59901	8505-8846-4729-7313	yes	1/29/2016	no	Van	Ford
Lillard	524688210	977 Water Street Massapequa Park, NY 11762	3124-6895-4582-5545	yes	1/24/2022	no	Truck	Toyota
Howard	648031327	940 S. Lexington Ave. Pawtucket, RI 02860	9367-1434-2364-9043	yes	5/20/2008	no	SUV	Honda
Nash	150517568	7733 N. Miles Ave. Sarasota, FL 34231	2087-9808-1276-2178	yes	2/13/2007	no	Motorcycle	Yamaha
Jordan	430253415	21 E. Rockland St. Defiance, OH 43512	5584-9403-9651-2754	yes	0/20/2019	yes	SUV	Honda
uille O'Neal	328104341	9852 Bay Road Wake Forest, NC 27587	2932-1060-8676-2368	yes	11/2/2017	yes	Limo	Cadillac
ving	402961684	635 NW. Theatre Avenue Saint Augustine, FL 32084	8012-7226-9586-9094	yes	12/2/2017	yes	Van	Ford
rving	402961684	635 NW. Theatre Avenue Saint Augustine, FL 32084	8012-7226-9586-9094	yes	10/1/2016	yes	SUV	Honda
ompson	411328207	7290 Central Drive Franklin, MA 02038	7795-8570-1434-2378	yes	10/7/2007	yes	SUV	Honda
o Anthony	505193514	7459 St Paul Street Oak Creek, WI 53154	6601-8097-1902-5317	yes	4/30/2014	yes	Truck	Toyota
Curry	376035219	526 Arch St. Kokomo, IN 46901	4652-3756-4301-2280	yes	4/27/2014	no	SUV	Honda
hen Curry	376035219	526 Arch St. Kokomo, IN 46901	4652-3756-4301-2280	yes	11/1/2001	no	Limo	Cadillac
rozan	943003495	37 Beech St. Mahwah, NJ 07430	2441-6865-1689-8444	yes	2/30/2016	no	Van	Ford
ames	210359233	771 Strawberry St. Melrose, MA 02176	6440-7729-6031-5117	yes	3/17/2022	yes	SUV	Honda
n James	210359233	771 Strawberry St. Melrose, MA 02176	6440-7729-6031-5117	yes	3/23/2013	no	Limo	Cadillac

# First Normal Form

Order Id (PK)	name:	license_no	address	payment	dates	available	vehicle_type	vehicle_brand
1	Ans Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-777 7-2915	1/2/2018	yes	Limo	Cadillac
2	Ans Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-777 7-2915	1/6/2018	no	Truck	Toyota
3	Chris Paul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-749 2-6649	1/31/2001	no	SUV	Honda
4	Draymond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-969 0-3059	3/9/2002	yes	Limo	Cadillac
5	Anthony Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-742 6-7172	2/11/2017	yes	Motorcycle	Yamaha
6	Kobe Bryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-756 7-1429	4/3/2005	yes	Truck	Toyota
7	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-812 3-7067	4/23/2005	yes	Van	Ford
8	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-812 3-7067	9/2/2003	no	Motorcycle	Yamaha

# Second Normal Form

Contact					Order					
contact_id (PK)	name:	license_no	address	payment	Order_Id (PK)	dates	Paid	available	contact id(FK)	vehicle_id
1	Ans Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-7777-2915	1	1/2/2018	yes	yes	1	1
2	Chris Paul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-7492-6649	2	1/6/2018	yes	no	1	2
3	Draymond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-9690-3059	3	1/31/2001	yes	no	2	3
4	Anthony Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-7426-7172	4	3/9/2002	yes	yes	3	1
5	Kobe Bryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-7567-1429	5	2/11/2017	yes	yes	4	4
6	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067	6	4/3/2005	yes	yes	5	2
7	Derrick Rose	65103350	740 Bow Ridge Court Phoenix, AZ 85021	8305-3925-3084-4327	7	4/23/2005	yes	yes	6	5

Vehicles	vehicle id (PK)	vehicle_type	vehicle_brand	Order_Id (FK)
	1	Limo	Cadillac	1
	2	Truck	Toyota	2
	3	SUV	Honda	3
	4	Motorcycle	Yamaha	4
	5	Van	Ford	5

# Third Normal Form

Contact					Order					
contact_id (PK)	name:	license_no	address	payment	Order_Id	contact id (FK)	date	vehicle_id	Paid	available
1	Ans Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-7777-2915	1	1	1/2/2018	1	yes	yes
2	Chris Paul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-7492-6649	2	1	1/6/2018	2	yes	no
3	Draymond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-9690-3059	3	2	1/31/2001	3	yes	no
4	Anthony Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-7426-7172	4	3	3/9/2002	1	yes	yes
5	Kobe Bryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-7567-1429	5	4	2/11/2017	4	yes	yes
6	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067	6	5	4/3/2005	2	yes	yes
7	Derrick Rose	65103350	740 Bow Ridge Court Phoenix, AZ 85021	8305-3925-3084-4327	7	6	4/23/2005	5	yes	yes

Vehicles	vehicle id (FK)	vehicle_type	vehicle_brand	Order_Id (FK)
	1	Limo	Cadillac	1
	2	Truck	Toyota	2
	3	SUV	Honda	3
	4	Motorcycle	Yamaha	4
	5	Van	Ford	5



# Loading data into normalized schema

## 1. create the contact table

```
create table contact(contact_id int auto_increment primary key, name varchar(32), license_no int, address varchar(62), payment varchar(64));
```

## 2. create orders table

```
create table orders (order_id int auto_increment primary key, contact_id int, foreign key (contact_id) references contact(contact_id), date varchar(32), vehicle_id int, p varchar(12), available varchar(12));
```

## 3. create vehicles table

```
create table vehicles (vehicle_id int auto_increment primary key, vehicle_type varchar(32), vehicle_brand varchar(32));
```

## 4. inserting values into contact

```
insert into contact (name, license_no, address, payment) select name, license_no, address, payment from project_data_raw group by name, license_no, address, payment;
```

## 5. Insert into orders table

```
insert into orders(contact_id, date, vehicle_id, paid, available) select c.contact_id, p.date, v.vehicle_id, p.paid, p.available from contact c, project_data_raw p, vehicles v where c.name = p.name and v.vehicle_type = p.vehicle_type and p.paid = 'yes' order by c.contact_id asc;
```

## 6. insert distinct value brand and type to vehicles table

```
insert into vehicles (vehicle_type, vehicle_brand) select distinct vehicle_type, vehicle_brand from project_data_raw;
```



# Finding data

**Finding number of available vehicles based on the orders**

select count(available) from orders where available = 'yes';

count(available)
14

**Find what dates each contact rented a car from**

select contact.contact\_id, orders.date from orders join contact  
on contact.contact\_id = orders.contact\_id;

contact_id	date
1	1/2/2018
1	1/6/2018
2	1/31/2001
3	3/9/2002
4	2/11/2017
5	4/3/2005
6	4/23/2005
6	9/2/2003
7	11/27/2009

**Find the number of times a contact rented a car**

select count(contact\_id) from orders where contact\_id = 1;

select count(contact.name) from contact join orders where orders.contact\_id  
= contact.contact\_id and contact.name = "Kyrie Irving";

count(contact_id)
2

count(c.name)
2

**Find most popular rented vehicle**

select o.vehicle\_id, v.vehicle\_type, count(\*) as max from orders o,  
vehicles v group by vehicle\_type, vehicle\_id order by max desc  
limit 1;

vehicle_id	vehicle_type	max
3	Van	9

**Find the types vehicles a specific person rented (Kyrie Irving)**

select c.name, v.vehicle\_type from contact c, vehicles v, orders o  
where o.contact\_id = c.contact\_id and v.vehicle\_id = o.vehicle\_id  
and c.name = "Kyrie Irving";

name	vehicle_type
Kyrie Irving	Van
Kyrie Irving	SUV

Contact					Order					
Contact_id (FK)	name:	license_no	address	payment	Order_id	contactid (FK)	dates	vehicle_id	Paid	available
1	Ans Choudhary	804289385	695 Park Ave. New York, NY 10065	6383-4886-7777-2915	1	1	1/2/2018	1	yes	yes
2	Chris Paul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-7492-6649	2	1	1/6/2018	2	yes	no
3	Draymond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-9690-3059	3	2	1/31/2001	3	yes	no
4	Anthony Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-7426-7172	4	3	3/9/2002	1	yes	yes
5	Kobe Bryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-7567-1429	5	4	2/11/2017	4	yes	yes
6	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067	6	5	4/3/2005	2	yes	yes
7	Derrick Rose	65103350	740 Bow Ridge Court Phoenix, AZ 85021	8305-3925-3084-4327	7	6	4/23/2005	5	yes	yes

# Overall

	vehide id (FK)	vehide type	vehide brand
Vehides	1	Limo	Cadillac
	2	Truck	Toyota
	3	SUV	Honda
	4	Motorcycle	Yamaha
	5	Van	Ford

contact_id	name	license_no	address	payment
1	Ans Choudhary	804289385	695 Park Ave, New York, NY 10065	6383-4886-7777-2915
2	Chris Paul	278722863	8951 N. Wakehurst St. Montgomery, AL 36109	6335-3386-7492-6649
3	Draymond Green	412776092	44 Henry Street Sulphur, LA 70663	4362-5027-9690-3059
4	Anthony Davis	374344045	260 Fremont Road Gwynn Oak, MD 21207	6926-7540-7426-7172
5	Kobe Bryant	317097468	94 North Pheasant Road Traverse City, MI 49684	5211-1368-7567-1429
6	Justin Too	631704568	879 William St. Columbus, GA 31904	1530-2862-8123-7067
7	Dwayne Wade	150122847	860 W. Maiden Drive Sacramento, CA 95820	4929-9802-6022-9058
8	Kevin Love	244316439	9660 Buckingham Ave. Southfield, MI 48076	8167-5393-2456-3011
9	John Wall	909002906	28 Beacon Street Coatesville, PA 19320	3229-6373-3421-2919
10	James Harden	933110198	86 Greystone Ave. Grand Island, NE 68801	8537-6198-3324-3315
11	Kawhi Leonard	977648524	8684 Grandrose Dr. Sterling Heights, MI 48310	4413-7526-1091-1980
12	Kevin Durant	58657202	362 W. Hill Field Ave. Monroe, NY 10950	1873-8862-7170-8996
13	Derrick Rose	65103350	740 Bow Ridge Court Phoenix, AZ 85021	8305-3925-3084-4327
14	Russel Westbrook	307565986	23 Alton Street Kalispell, MT 59901	8505-8846-4729-7313
15	Damien Lillard	524688210	977 Water Street Massapequa Park, NY 11762	3124-6895-4582-5545
16	Dwight Howard	648031327	940 S. Lexington Ave. Pawtucket, RI 02860	9367-1434-2364-9043
17	Steve Nash	150517568	7733 N. Miles Ave. Sarasota, FL 34231	2087-9808-1276-2178
18	Michael Jordan	430253415	21 E. Rockland St. Defiance, OH 43512	5584-9403-9651-2754
19	Shaquille O'Neal	328104341	9852 Bay Road Wake Forest, NC 27587	2932-1060-8676-2368
20	Kyrie Irving	482961684	635 NW. Theatre Avenue Saint Augustine, FL 32084	8012-7226-9586-9094
21	Klay Thompson	411328207	7290 Central Drive Franklin, MA 02038	7795-8570-1434-2378
22	Carmelo Anthony	505193514	7459 St Paul Street Oak Creek, WI 53154	6601-8097-1902-5317
23	Stephen Curry	376035219	526 Arch St. Kokomo, IN 46901	4652-3756-4301-2280
24	Demar Derozan	943003495	37 Beech St. Mahwah, NJ 07430	2441-6865-1689-8444
25	Lebron James	210359233	771 Strawberry St. Melrose, MA 02176	6440-7729-6031-5117

mysql> select \* from orders;

order_id	contact_id	date	vehicle_id	paid	available
1	1	1/2/2018	1	yes	yes
2	1	1/6/2018	2	yes	no
3	2	1/31/2001	3	yes	no
4	3	3/9/2002	1	yes	yes
5	4	2/11/2017	4	yes	yes
6	5	4/3/2005	2	yes	yes
7	6	4/23/2005	5	yes	yes
8	6	9/2/2003	4	yes	no
9	7	11/27/2009	3	yes	no
10	8	3/13/2005	1	yes	no
11	9	5/14/2022	5	yes	no
12	10	10/31/2022	3	yes	no
13	11	12/6/2015	1	yes	no
14	12	4/23/2008	4	yes	yes
15	12	5/23/2008	1	yes	no
16	13	5/3/2011	4	yes	yes
17	14	1/29/2016	5	yes	no
18	15	1/24/2022	2	yes	no
19	16	5/20/2008	3	yes	no
20	17	2/13/2007	4	yes	no
21	18	0/20/2019	3	yes	yes
22	19	11/2/2017	1	yes	yes
23	20	12/2/2017	5	yes	yes
24	20	10/1/2016	3	yes	yes
25	21	10/7/2007	5	yes	yes
26	22	4/30/2014	2	yes	yes
27	23	4/27/2014	3	yes	no
28	23	11/1/2001	1	yes	no
29	24	2/30/2016	5	yes	no
30	25	3/17/2022	3	yes	yes
31	25	3/23/2013	1	yes	no

31 rows in set (0.00 sec)

mysql> select \* from vehicles;

vehicle_id	vehicle_type	vehicle_brand
1	Limo	Cadillac
2	Truck	Toyota
3	SUV	Honda
4	Motorcycle	Yamaha
5	Van	Ford

25 rows in set (0.00 sec)