

Database and Data Warehousing, Group Project

Group 11

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16:137:538 Database and Data Warehousing

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SUMMARY

Buying a car can be one of the biggest expenses in your life, and it can also be one of the most challenging as well. With new brands and new segments of cars popping up everywhere, it can be hard to know what you want. However, the car buying process no longer requires lengthy trips to the dealership to be badgered by a salesperson; you can now do everything from the comfort of your home. The emergence of the global COVID-19 pandemic reinforces the need for online car vendors, and the emergence of startups such as Carvana validates the desire for this style of car shopping. The following report describes the creation and deployment of a web-based car buying experience which utilizes SQL, PHP, and HTML to build the application.

Before building the application, the business fundamentals of an online car vendor had to be drawn up. Building this foundation first included creating a detailed list of business rules. These business rules govern how the car vendor operates, such as how customers are able to explore the vendor's website, how cars and dealerships are able to be stored and organized on the site, the features allowed for the cars, etc. Once these business rules were solidified, the next step was to create a detailed Entity Relationship Diagram (ERD). Before creating the actual diagram, detailed descriptions of each entity had to be formed which cover the features of each entity. These features were then used to fill the ERD, and would eventually be used as the basis for future database tables. This ERD lays the framework for the future application as it describes the relationships between the various entities and how they are allowed to interact with each other. This is a crucial step as the ERD defines the primary and foreign keys of the entities which helps to create a seamless flow of information between the entities, thereby resulting in a seamless customer experience. Once the foundation was built, it was time to start building the database. All of the necessary tables were created using SQL Create Table commands describing the features and type of features for each entity. Once the necessary tables were created, the tables were filled with instances utilizing SQL Insert Into commands. Lastly, to test the newly created tables, user retrieval queries were created using Select commands. Now with a functional database, it was time for the application to be created and the process of which is outlined in detail later in the report.

The application described in this report was created through an end-to-end effort to bring an enjoyable car-buying experience to customers. Not only were the business fundamentals considered, but the creation of the necessary database was completed using SQL. Although this application is still in its infancy, it's proving to be worthy of entering the burgeoning online car marketplace.

INTRODUCTION

Finding a new car can be tough. With so many options available, finding your perfect car can be like searching for a needle in a haystack. And when you do finally find your car, it's tough to know whether you're getting a good price or not. However, with **insert website name here**, finding a car has never been easier!

Mrs. Smith has created this platform for selling cars, **insert website name here**, from multiple different automobile companies that she is partnered with in order to provide the best options and availability in the market for new and used cars. The following pages provide several new ideas to improve the website and database functionality. This includes several business rules and requirements that will form the basis of the database, and the queries used when the customers are in the process of selecting and purchasing their dream car(s). With the improved design, thorough business rules, and well structured queries proposed in this document, the customer experience will be nothing short of amazing.

Ideas for new site:

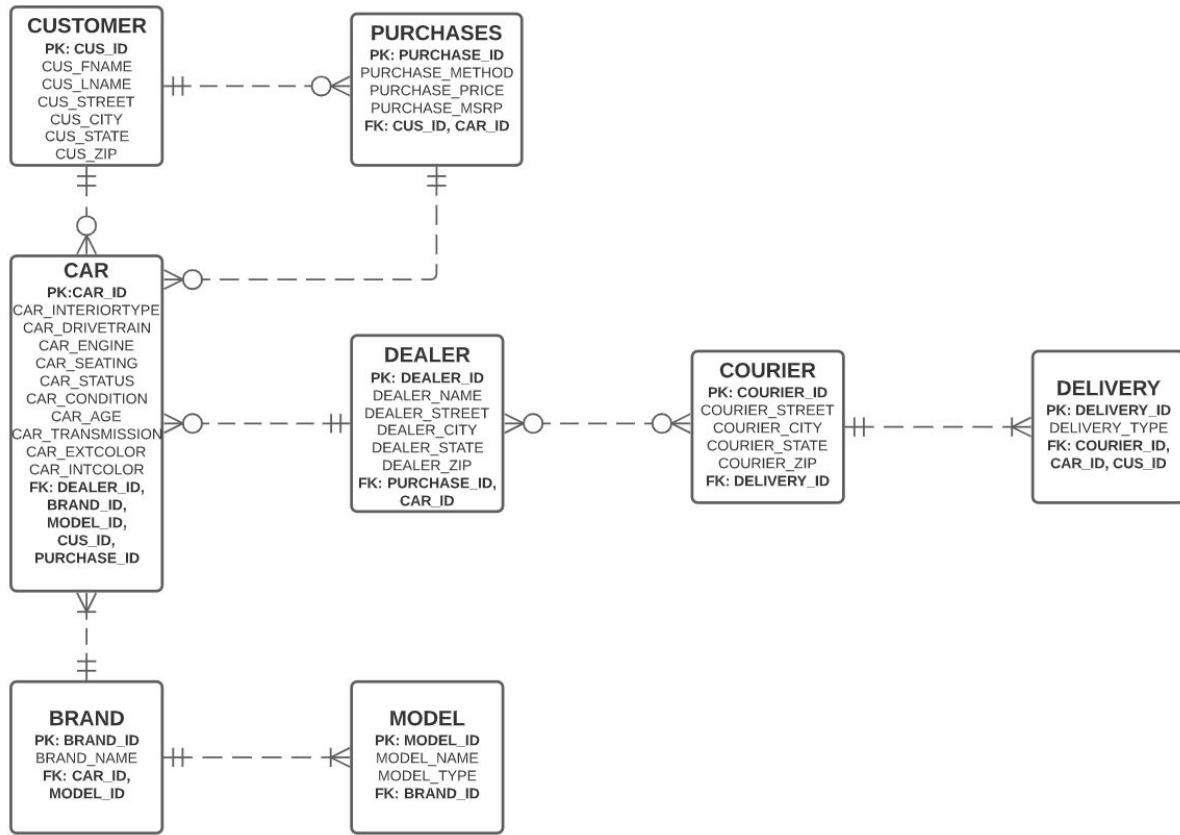
- Ms. Smith enjoys the clean information flow on truecar, so we should aim to maintain that
- One thing I like about one of truecar's competitors, autotrader.com, is how they highlight some of the available cars on the homepage; this could help the user find a car faster, as well as expose them to cars they weren't previously considering
- Separate tabs for new, used, sell/trade
- Could potentially incorporate a personality test or a brief questionnaire, this could help the first-time buyer figure out what they want
- Similar to Carvana, Ms. Smith's website could form partnerships with delivery services to have cars delivered to the users
- Kelly Blue Book integration to ensure best price possible
- Add different search starting points depending on a feature the user knows they desire, for example give the option of searching not only by brand but also by body style, number of seats, price, etc.
- Consider including a functionality where the user enters the make/model of their current (older) car, and are returned with current, new options available that they may like based on their level of satisfaction with their current car

BUSINESS RULES + REQUIREMENTS

1. A customer may search for multiple cars, and each car may be searched for by multiple customers.
2. A customer can buy multiple cars, but each car can only be bought by one customer.
3. Multiple cars may have the same set of features, but each car only has one set of features.
4. Each brand of car may have multiple cars available, but each car only belongs to one brand.
5. Each brand of car may have multiple models offered, but each model only belongs to one brand .
6. Multiple cars may have the same price, but each car only has one price
7. Each car only has one price, but there are many payment methods available to the customer to pay that price.
8. There are many paint colors available, but each car (generally) only has one color.
9. There are multiple body styles available, but each car only has one body style
10. There are many seating patterns (number of seats) available, but each car can only have one seating pattern.
11. Each automobile company sells many cars, each car will only come from one of the automobile companies.
12. Every car has only one type of drivetrain, but there are many different types of drivetrains that a car can have (AWD, FWD, RWD).
13. Each car only has one method of transfer to the customer, but there are many different types of methods of transfer to the customer (delivery, pickup).
14. Only one delivery company can deliver a car to the customer, but there are many different delivery companies available to deliver cars.
15. Each car can only have one of the many types of transmissions available. (automatic, CVT, manual)
16. There are multiple cars under the new and used car list, but each car only belongs to new or used cars.
17. A car can only be in one zip code, but each customer can search multiple cars under different zip codes.
18. A customer can be buyer and seller, but each car can only be bought by or sell by.
19. Each car model can have different styles of engine (electric, hybrid, gas), but each car will only have one type of engine.

20. Each car model can have multiple exterior colors, but each car will only have one exterior color
21. Each car model can have multiple interior colors, but each car will only have one interior color.
22. Exterior/Interior colors can have standard color and premium color, but each color can only belong to standard color or premium color.
23. Each car model can have multiple preferred styles, but each car will only have one preferred style.
24. Each car model can have multiple popular options packages, but each car will only have one popular options package.
25. Each car can only have one MSRP, but each car will have different true prices for different customers, considering the conditions of the customer, available deals from the seller, and the associated discount available.

ER DIAGRAM



- **Customer:** Customer ID, FName, LName, Address, City, State, Zip Code, Email, Username, Password
- **Car:** Car ID, Dealer ID, Brand ID, Model ID, Customer ID, Purchase ID, VIN, Car YEAR
 - **Features**
 - **Body Style:** (Coupe, Sedan, SUV, etc.)
 - **Drivetrain:** (AWD, FWD, RWD)
 - **Engine:** (V6, V8, etc.)
 - **Seating Pattern:** (2, 5, 7, 8, etc.)
 - **Options Package:** (Turbo, Heated Seats, Sunroof, etc.)
 - **Age:** (New, Used)
 - **Transmission:** (Manual, CVT, Automatic)
 - **Interior Color:** (Blue, Black, Tan, etc.)
 - **Paint Color:** (Blue, Gray, Black, White, Orange, etc.)
 - **Premium/Basic**
- **Brand:** Brand ID, Brand Name (Honda, Acura, Hyundai, Tesla, Ford, Chevy, etc.), Car ID, Model ID
- **Model:** Brand ID, Model ID, Model Name (CRV, HRV, Civic, Accord, etc.), Type (LX, EX, etc.)
- **Purchases:** Purchase ID, Method (Cash, Credit, Check, Loan), Car ID, Customer ID, Price, MSRP, Total Cost
- **Dealer:** Dealer ID, Name, Address, City, State, Zip Code, Purchase ID, Car ID
- **Method of Transfer:** (Delivery, Pickup)
- **Delivery Company:** Delivery Company ID, Address, City, State, Zip Code, Car ID, Customer ID

TABLES WITH DATA

Overall, we created 8 tables to cover detailed information for customers, transactions, and cars.

The screenshot shows the phpMyAdmin interface for a database named 'sq9376090'. On the left, there's a tree view of the database structure with nodes for 'information_schema' and 'sq9376090', which contains 'New', 'BRAND', 'CAR', 'COURIER', 'CUSTOMER', 'DEALER', 'DELIVERY', 'MODEL', and 'PURCHASES'. The main area displays a table of 8 tables with the following details:

Table	Action	Rows	Type	Collation	Size	Overhead
BRAND	Browse Structure Search Insert Empty Drop	83	InnoDB	latin1_swedish_ci	16 Kib	-
CAR	Browse Structure Search Insert Empty Drop	536	InnoDB	latin1_swedish_ci	176 Kib	-
COURIER	Browse Structure Search Insert Empty Drop	30	InnoDB	latin1_swedish_ci	16 Kib	-
CUSTOMER	Browse Structure Search Insert Empty Drop	500	InnoDB	latin1_swedish_ci	80 Kib	-
DEALER	Browse Structure Search Insert Empty Drop	114	InnoDB	latin1_swedish_ci	48 Kib	-
DELIVERY	Browse Structure Search Insert Empty Drop	30	InnoDB	latin1_swedish_ci	64 Kib	-
MODEL	Browse Structure Search Insert Empty Drop	1,101	InnoDB	latin1_swedish_ci	112 Kib	-
PURCHASES	Browse Structure Search Insert Empty Drop	500	InnoDB	latin1_swedish_ci	64 Kib	-
8 tables	Sum	2,894	InnoDB	latin1_swedish_ci	576 Kib	0 B

Below are the steps on how we created the tables and inserted the associated values.

1. Created a CUSTOMER table to show the basic information of each customer.

```
CREATE TABLE CUSTOMER (
    CUS_ID INTEGER,
    CUS_FNMAE VARCHAR(30),
    CUS_LNAME VARCHAR(30),
    CUS_STREET VARCHAR(30),
    CUS_CITY VARCHAR(30),
    CUS_STATE CHAR(2),
    CUS_ZIP INTEGER,
    PRIMARY KEY (CUS_ID));
```

The screenshot shows the phpMyAdmin interface with the SQL tab selected. A query has been entered into the 'Run SQL query/queries on database sq9376090:' text area:

```
1 CREATE TABLE CUSTOMER (
2     CUS_ID INTEGER,
3     CUS_FNMAE VARCHAR(30),
4     CUS_LNAME VARCHAR(30),
5     CUS_STREET VARCHAR(30),
6     CUS_CITY VARCHAR(30),
7     CUS_STATE CHAR(2),
8     CUS_ZIP INTEGER,
9     PRIMARY KEY (CUS_ID));
```

Below the query, there are several buttons: 'Clear', 'Format', 'Get auto-saved query', 'Bind parameters', 'Delimiter : ', 'Show this query here again' (checkbox checked), 'Retain query box' (checkbox uncheckable), 'Rollback when finished' (checkbox uncheckable), and 'Enable foreign key checks' (checkbox checked). At the bottom, a green message box states: 'MySQL returned an empty result set (i.e. zero rows). (Query took 0.0698 seconds.)' and the executed query is shown: 'CREATE TABLE CUSTOMER (CUS_ID INTEGER, CUS_FNMAE VARCHAR(30), CUS_LNAME VARCHAR(30), CUS_STREET VARCHAR(30), CUS_CITY VARCHAR(30), CUS_STATE CHAR(2), CUS_ZIP INTEGER, PRIMARY KEY (CUS_ID))'

2. Inserted information for our 500 customers into the CUSTOMER table

INSERT INTO CUSTOMER

```
VALUES ('15087', 'James', 'Butt', '6649 N Blue Gum St', 'New Orleans', 'LA', '70116'),
('9717', 'Josephine', 'Darakjy', '4 B Blue Ridge Blvd', 'Brighton', 'MI', '48116'),
('27941', 'Art', 'Venere', '8 W Cerritos Ave #54', 'Bridgeport', 'NJ', '8014'),
('22685', 'Lenna', 'Paprocki', '639 Main St', 'Anchorage', 'AK', '99501'),
('21859', 'Donette', 'Foller', '34 Center St', 'Hamilton', 'OH', '45011'),
('13072', 'Simona', 'Morasca', '3 Mcauley Dr', 'Ashland', 'OH', '44805'),
...
('27071', 'Chauncey', 'Motley', '63 E Aurora Dr', 'Orlando', 'FL', '32804');
```

The screenshot shows the phpMyAdmin interface for a database named 'sq9376090'. The 'Structure' tab is selected. In the main area, there is a large text input box containing the SQL query for inserting 500 customer records. Below the input box, there are several buttons: 'Clear', 'Format', 'Get auto-saved query', 'Bind parameters', and a 'Go' button. At the bottom of the screen, a green message box indicates that 500 rows were inserted successfully.

```
INSERT INTO CUSTOMER
VALUES ('15087', 'James', 'Butt', '6649 N Blue Gum St', 'New Orleans', 'LA', '70116'),
('9717', 'Josephine', 'Darakjy', '4 B Blue Ridge Blvd', 'Brighton', 'MI', '48116'),
('27941', 'Art', 'Venere', '8 W Cerritos Ave #54', 'Bridgeport', 'NJ', '8014'),
('22685', 'Lenna', 'Paprocki', '639 Main St', 'Anchorage', 'AK', '99501'),
('21859', 'Donette', 'Foller', '34 Center St', 'Hamilton', 'OH', '45011'),
('13072', 'Simona', 'Morasca', '3 Mcauley Dr', 'Ashland', 'OH', '44805'),
...
('27071', 'Chauncey', 'Motley', '63 E Aurora Dr', 'Orlando', 'FL', '32804');

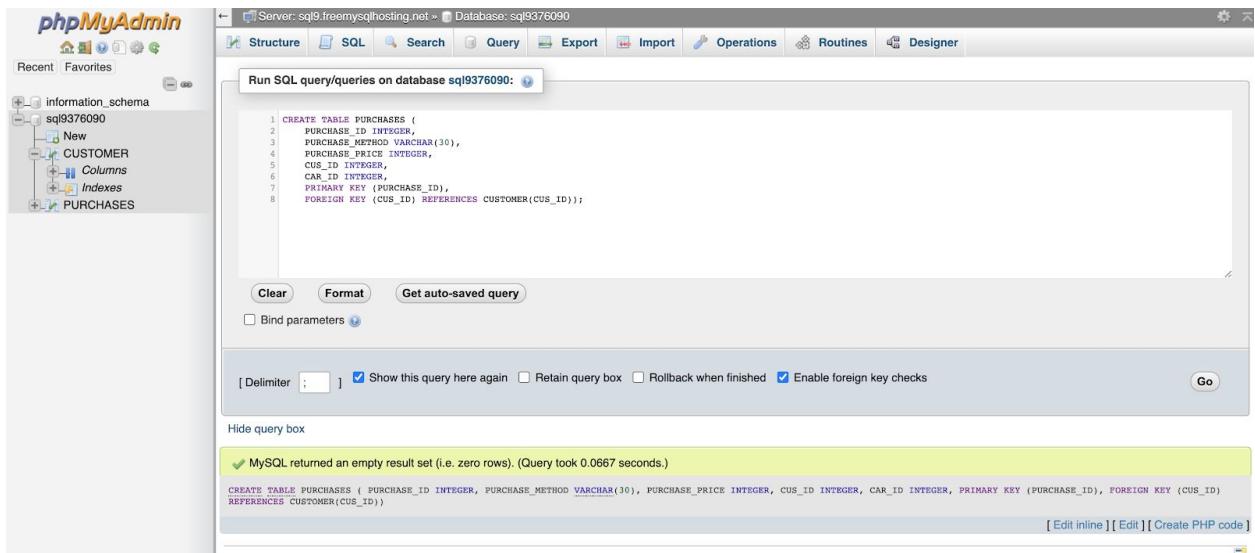
500 rows inserted. (Query took 0.1326 seconds.)
```

The screenshot shows the phpMyAdmin interface for the 'CUSTOMER' table. The 'Structure' tab is selected. The table has 10 columns: CUS_ID, CUS_FNMAE, CUS_LNAME, CUS_STREET, CUS_CITY, CUS_STATE, CUS_ZIP, CUS_ID, CUS_FNMAE, CUS_LNAME, CUS_STREET, CUS_CITY, CUS_STATE, and CUS_ZIP. There are 500 rows listed, each with a unique ID and specific address details. The table is sorted by CUS_ID.

CUS_ID	CUS_FNMAE	CUS_LNAME	CUS_STREET	CUS_CITY	CUS_STATE	CUS_ZIP
50	Graciela	Ruta	98 Connecticut Ave Nw	Chagrin Falls	OH	44023
84	Corinne	Loder	4 Carroll St	North Attleboro	MA	2760
93	Tracey	Modzelewski	77132 Coon Rapids Blvd Nw	Conroe	TX	77301
230	Bobbye	Rhym	30 W 80th St #1995	San Carlos	CA	94070
244	Nicolette	Brossart	1 Midway Rd	Westborough	MA	1581
277	Laurel	Pagliuca	36 Enterprise St Se	Richland	WA	99352
306	Rhea	Aredondo	25657 Live Oak St	Brooklyn	NY	11226
365	Reita	Leto	55262 N French Rd	Indianapolis	IN	46240
386	Noah	Kalafatis	1950 5th Ave	Milwaukee	WI	53209
390	Tegan	Arceo	62260 Park Stre	Monroe Township	NJ	8831
410	Lai	Harabedian	1933 Packer Ave #2	Novato	CA	94945
428	Ammie	Corrio	74874 Atlantic Ave	Columbus	OH	43215
470	Carlee	Boulter	8284 Hart St	Abilene	KS	67410
687	Thaddeus	Ankeny	5 Washington St #1	Roseville	CA	95678
739	Daniel	Perruzza	11360 St Halsted St	Santa Ana	CA	92705

3. Created a PURCHASE table to show the information of each transaction.

```
CREATE TABLE PURCHASES (
    PURCHASE_ID INTEGER,
    PURCHASE_METHOD VARCHAR(30),
    PURCHASE_PRICE INTEGER,
    CUS_ID INTEGER,
    CAR_ID INTEGER,
    PRIMARY KEY (PURCHASE_ID),
    FOREIGN KEY (CUS_ID) REFERENCES CUSTOMER(CUS_ID));
```



4. Inserted information for our 500 transactions into the PURCHASE table

INSERT INTO PURCHASES

```
VALUES ('12437', 'FINANCE', '38182', '15087', '3811'),
('2255', 'FINANCE', '33740', '9717', '11203'),
('1111', 'FINANCE', '31308', '27941', '16351'),
('2444', 'FINANCE', '40440', '22685', '19574'),
('7915', 'CASH', '53141', '21859', '4202'),
('96', 'CASH', '57771', '13072', '17346'),
...
('3709', 'FINANCE', '22748', '27071', '15205');
```

The screenshot shows the phpMyAdmin interface for a database named sq376090. The left sidebar lists tables: information_schema, sq376090, New, CUSTOMER, Columns, Indexes, and PURCHASES. The PURCHASES table is selected. The main area contains a SQL query editor with the following content:

```
1 INSERT INTO PURCHASES
2 VALUES ('12437', 'FINANCE', '38182', '15087', '3811'),
3 ('2255', 'FINANCE', '33740', '9717', '11203'),
4 ('1111', 'FINANCE', '31308', '27941', '16351'),
5 ('2444', 'FINANCE', '40440', '22685', '19574'),
6 ('7915', 'CASH', '53141', '21859', '4202'),
7 ('96', 'CASH', '47771', '1072', '17345'),
8 ('13014', 'FINANCE', '43781', '2761', '13165'),
9 ('287', 'FINANCE', '32493', '10385', '15791'),
10 ('14621', 'CASH', '35012', '29360', '5338'),
11 ('10432', 'FINANCE', '350485', '25265', '16738'),
12 ('1072', 'FINANCE', '33114', '1388', '5846'),
13 ('1881', 'FINANCE', '33801', '21213', '10620),
14 ('14441', 'FINANCE', '42494', '6927', '3768'),
```

Below the query are buttons for Clear, Format, Get auto-saved query, Bind parameters, Show this query here again (checked), Retain query box, Rollback when finished, Enable foreign key checks, and Go.

phpMyAdmin

Server: sq9.freemysqlhosting.net Database: sq9376090 Table: PURCHASES

Browse Structure SQL Search Insert Export Import Operations

Recent Favorites

information_schema
sql9376090
New
CUSTOMER
Columns
Indexes
PURCHASES

Showing rows 0 - 24 (500 total, Query took 0.0626 seconds.)

SELECT * FROM `PURCHASES`

1 > >> Show all Number of rows: 25 Filter rows: Search this table Sort by key: None

+ Options PURCHASE_ID PURCHASE_METHOD PURCHASE_PRICE CUS_ID CAR_ID

<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	25	FINANCE	28006	19481	7930
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	96	CASH	57771	13072	17346
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	97	CASH	34410	3204	13874
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	117	CASH	49981	3918	5633
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	140	FINANCE	27478	21089	3869
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	148	FINANCE	20629	2577	19929
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	161	CASH	27909	4741	13012
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	175	CASH	50970	9063	11670
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	183	FINANCE	21771	13219	18233
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	212	FINANCE	28348	1068	18166
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	251	CASH	26025	18342	11649
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	255	FINANCE	29512	10599	19744
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	287	FINANCE	32493	10385	15791
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	308	FINANCE	44680	5422	16371
<input type="checkbox"/>	<input type="button" value="Edit"/>	<input type="button" value="Copy"/>	<input type="button" value="Delete"/>	366	FINANCE	40705	22270	17249

Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

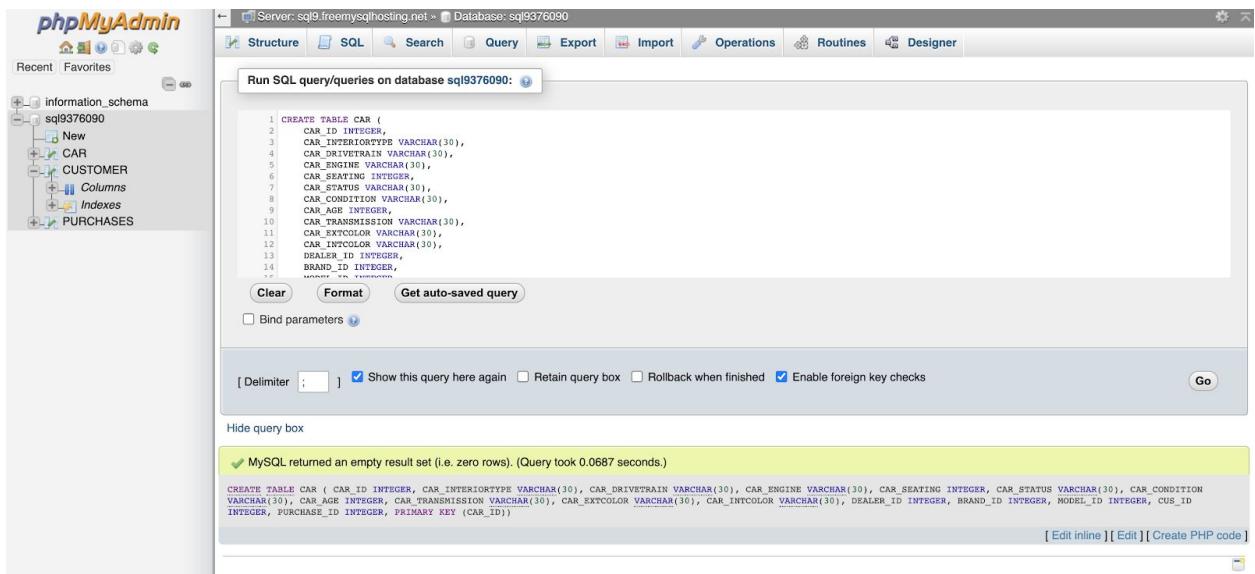
5. Created a CAR table to show the information of each car.

```
CREATE TABLE CAR (
    CAR_ID INTEGER,
    CAR_INNERIORTYPE VARCHAR(30),
    CAR_DRIVETRAIN VARCHAR(30),
    CAR_ENGINE VARCHAR(30),
    CAR_SEATING INTEGER,
    CAR_STATUS VARCHAR(30),
    CAR_CONDITION VARCHAR(30),
    CAR_AGE INTEGER,
```

```

CAR_TRANSMISSION VARCHAR(30),
CAR_EXTCOLOR VARCHAR(30),
CAR_INTCOLOR VARCHAR(30),
DEALER_ID INTEGER,
BRAND_ID INTEGER,
MODEL_ID INTEGER,
CUS_ID INTEGER,
PURCHASE_ID INTEGER,
PRIMARY KEY (CAR_ID);

```



The screenshot shows the phpMyAdmin interface for a database named 'sq9376090'. On the left, the database structure is visible with tables 'CAR', 'CUSTOMER', and 'PURCHASES'. The 'CAR' table has columns: CAR_ID, CAR_INTERIORTYPE, CAR_DRIVETRAIN, CAR_ENGINE, CAR_SEATING, CAR_STATUS, CAR_CONDITION, CAR_AGE, CAR_TRANSMISSION, CAR_EXTCOLOR, CAR_INTCOLOR, DEALER_ID, BRAND_ID, MODEL_ID, CUS_ID, PURCHASE_ID, and PRIMARY KEY (CAR_ID). The 'Run SQL query/queries on database sq9376090:' field contains the CREATE TABLE statement shown above. Below the query field, there are buttons for 'Clear', 'Format', and 'Get auto-saved query'. Underneath the query field, there are checkboxes for 'Bind parameters', 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks'. At the bottom of the screen, a message box indicates that MySQL returned an empty result set (0.0687 seconds). The message also includes the full CREATE TABLE statement.

```

CREATE TABLE CAR (
    CAR_ID INTEGER,
    CAR_INTERIORTYPE VARCHAR(30),
    CAR_DRIVETRAIN VARCHAR(30),
    CAR_ENGINE VARCHAR(30),
    CAR_SEATING INTEGER,
    CAR_STATUS VARCHAR(30),
    CAR_CONDITION VARCHAR(30),
    CAR_AGE INTEGER,
    CAR_TRANSMISSION VARCHAR(30),
    CAR_EXTCOLOR VARCHAR(30),
    CAR_INTCOLOR VARCHAR(30),
    DEALER_ID INTEGER,
    BRAND_ID INTEGER,
    MODEL_ID INTEGER,
    CUS_ID INTEGER,
    PURCHASE_ID INTEGER,
    PRIMARY KEY (CAR_ID)
);

[ Delimiter : ]  Show this query here again  Retain query box  Rollback when finished  Enable foreign key checks  Bind parameters  Hide query box  Go [ Edit inline ] [ Edit ] [ Create PHP code ]

```

6. Inserted information for our 536 cars into the CAR table

INSERT INTO CAR

```

VALUES ('917', '325i 2dr Convertible', '(2.5L 6-cyl. 5-speed Manual)', 'I6', '4', 'Used',
'Bad', '30', '5-speed manual', 'Iceland Green Metallic', 'Gray', '35', '6', '92', '15087',
'7454'),
('7196', '325i 4dr Sedan', '(2.5L 6-cyl. 5-speed Manual)', 'I6', '4', 'Used', 'Bad', '30',
'5-speed manual', 'Laguna Green Metallic', 'Gray', '9', '6', '92', '9717', '13307'),
('7646', '325iX 4dr Sedan AWD', '(2.5L 6-cyl. AWD 5-speed Manual)', 'I6', '4', 'Used',
'Bad', '30', '5-speed manual', 'Glacier Blue Metallic', 'Black', '34', '6', '92', '27941', '4607'),
('3260', '325is 2dr Coupe', '(2.5L 6-cyl. 5-speed Manual)', 'I6', '4', 'Used', 'Bad', '30',
'5-speed manual', 'Sterling Silver Metallic', 'Gray', '18', '6', '92', '22685', '8744'),
('12424', '325i 2dr Coupe', '(2.5L 6-cyl. 5-speed Manual)', 'I6', '4', 'Used', 'Bad', '30',
'5-speed manual', 'Calypso Red Metallic', 'Black', '81', '6', '92', '21859', '7208'),
('15539', '325iX 2dr Coupe AWD', '(2.5L 6-cyl. AWD 5-speed Manual)', 'I6', '4', 'Used',
'Bad', '30', '5-speed manual', 'Calypso Red Metallic', 'Black', '98', '6', '92', '13072',
'12998'),

```

('17283', 'Limited 4dr Hatchback (1.8L 4cyl gas/electric hybrid CVT)', '(1.8L 4-cyl. Hybrid CVT Automatic)', 'I4', '5', 'New', 'Excellent', '0', 'continuously variable-speed automatic', 'Electric Red', 'Venetian Beige', '59', '81', '1040', '24614', '2592');

The screenshot shows the phpMyAdmin interface for a MySQL database named 'sq9376090'. The left sidebar lists databases (information_schema, sq9376090), tables (New, CAR, CUSTOMER, PURCHASES), and other schema objects. The main area displays the 'CAR' table with 536 rows. The table has columns: CAR_ID, CAR_INTERIORTYPE, CAR_DRIVETRAIN, CAR_ENGINE, CAR_SEATING, CAR_STATUS, CAR_CONDITION, CAR_AGE, and CAR_TRANS. The first few rows are:

CAR_ID	CAR_INTERIORTYPE	CAR_DRIVETRAIN	CAR_ENGINE	CAR_SEATING	CAR_STATUS	CAR_CONDITION	CAR_AGE	CAR_TRANS
34	One Fleet 4dr Hatchback 1.8L	(1.8L 4-cyl. Hybrid CVT Autom	I4	5	Used	Good	5	continuously variable speed au
208	325i 4dr Rwd Coupe (2.5L 6cy	(2.5L 6-cyl. 5-speed Manual	I6	5	Used	Normal	16	5-speed manual
223	320i xDrive 4dr Sedan AWD (2.0	(2.0L 4-cyl. Turbo AWD 6-speed	I4	5	Used	Good	2	8-speed shiftable automatic
278	328i 2dr Convertible	(2.8L 6-cyl. 5-speed Manual)	I6	4	Used	Bad	24	5-speed manual
313	2dr Regular Cab XLT Rwd Styles	(4.2L V6 5-speed Manual 8.1 ft	V6	3	Used	Normal	15	5-speed manual
411	325xi 4dr Wagon AWD (3.0L 6cy	(3.0L 6-cyl. AWD 6-speed Manual	I6	5	Used	Normal	14	6-speed manual
441	XLT 4dr SuperCab 4WD 6.5 ft. S	(3.5L V6 FFV 4x4 6-speed Autom	V6	6	Used	Good	5	6-speed shiftable automatic
478	318is 2dr Coupe	(1.8L 4-cyl. 5-speed Manual	I4	4	Used	Bad	26	5-speed manual
479	325xi 4dr Sedan AWD (3.0L 6cy	(3.0L 6-cyl. AWD 6-speed Manua	I6	5	Used	Normal	14	6-speed manual
523	4dr SuperCrew King Ranch 4WD S	(5.4L V8 4x4 4-speed Automatic	V8	6	Used	Normal	15	4-speed automatic

7. Created a BRAND table to show the information of each brand.

```
CREATE TABLE BRAND (
    BRAND_ID INTEGER,
    BRAND_NAME VARCHAR(30),
    PRIMARY KEY (BRAND_ID));
```

The screenshot shows the phpMyAdmin interface for a database named 'sql9376090'. The left sidebar lists databases (information_schema, sql9376090), tables (New, BRAND, CAR, CUSTOMER, PURCHASES), and their respective columns and indexes. The main panel is titled 'Table: CAR' and contains a SQL query editor. The query is:

```

1 CREATE TABLE BRAND (
2   BRAND_ID INTEGER,
3   BRAND_NAME VARCHAR(30),
4   PRIMARY KEY (BRAND_ID);

```

The 'Columns' section on the right lists the columns for the BRAND table, including:

- CAR_ID
- CAR_INNERIORTYPE
- CAR_DRIVETRAIN
- CAR_ENGINE
- CAR_SEATING
- CAR_STATUS
- CAR_CONDITION
- CAR_AGE
- CAR_TRANSMISSION
- CAR_EXTCOLOR
- CAR_INTCOLOR
- DEALER_ID
- BRAND_ID

Below the query editor, there are buttons for SELECT, INSERT, UPDATE, DELETE, Clear, and Format. A note says 'Get auto-saved query' and 'Bind parameters'. The Delimiter is set to a semicolon. There are checkboxes for 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks'. A 'Go' button is at the bottom right.

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0654 seconds.)

[CREATE TABLE BRAND \(BRAND_ID INTEGER, BRAND_NAME VARCHAR\(30\), PRIMARY KEY \(BRAND_ID\) \)](#)

[Edit inline] [Edit] [Create PHP code]

8. Inserted information for 83 brands into the BRAND table.

**INSERT INTO BRAND
VALUES ('1', 'Acura'),
('2', 'Alfa Romeo'),
('3', 'Aston Martin'),
('4', 'Audi'),
('5', 'Bentley'),
...
('83', 'Volvo');**

The screenshot shows the phpMyAdmin interface for the same database. The left sidebar is identical. The main panel is titled 'Run SQL query/queries on database sql9376090' and contains the following SQL query:

```

1 INSERT INTO BRAND
2 VALUES ('1', 'Acura'),
3 ('2', 'Alfa Romeo'),
4 ('3', 'Aston Martin'),
5 ('4', 'Audi'),
6 ('5', 'Bentley'),
7 ('6', 'BMW'),
8 ('7', 'Brilliance'),
9 ('8', 'Bugatti'),
10 ('9', 'Buick'),
11 ('10', 'BYD'),
12 ('11', 'Cadillac'),
13 ('12', 'Changan'),
14 ('13', 'Chery'),
15 ('14', 'Chevrolet'),
16 ('15', 'Chrysler'),
17 ('16', 'Citroen'),
18 ('17', 'Daewoo'),
19 ('18', 'Daihatsu'),
20 ('19', 'Datsun'),
21 ('20', 'Dodge'),
22 ('21', 'Dongfeng'),
23 ('22', 'FAW'),
24 ('23', 'Ferrari'),
25 ('24', 'Fiat'),
26 ('25', 'Fisker'),
27 ('26', 'Ford'),
28 ('27', 'GAZ'),
29 ('28', 'Geely'),
30 ('29', 'Genesis'),
31 ('30', 'GMC'),
32 ('31', 'Great Wall'),
33 ('32', 'Haval'),
34 ('33', 'Holden'),
35 ('34', 'Honda'),
36 ('35', 'Hummer'),
37 ('36', 'Hyundai'),
38 ('37', 'Infiniti'),
39 ('38', 'Isuzu'),
40 ('39', 'Iveco'),
41 ('40', 'Jaguar'),
42 ('41', 'Jeep'),
43 ('42', 'Kia'),
44 ('43', 'Lamborghini'),
45 ('44', 'Lancia'),
46 ('45', 'Land Rover'),
47 ('46', 'Lexus'),
48 ('47', 'Lincoln'),
49 ('48', 'Lotus'),
50 ('49', 'Marussia'),
51 ('50', 'Maserati'),
52 ('51', 'Maserati'),
53 ('52', 'Mitsubishi'),
54 ('53', 'Nissan'),
55 ('54', 'OPEL'),
56 ('55', 'Porsche'),
57 ('56', 'Renault'),
58 ('57', 'Skoda'),
59 ('58', 'Subaru'),
60 ('59', 'Suzuki'),
61 ('60', 'Tata'),
62 ('61', 'Toyota'),
63 ('62', 'Vauxhall'),
64 ('63', 'Volvo'),
65 ('64', 'Wuling'),
66 ('65', 'Xiaoyao'),
67 ('66', 'Yutong')

```

The 'Columns' section on the right is not visible in this screenshot. Below the query editor, there are buttons for Clear, Format, and Get auto-saved query. A note says 'Bind parameters'. The Delimiter is set to a semicolon. There are checkboxes for 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks'. A 'Go' button is at the bottom right.

83 rows inserted. (Query took 0.0632 seconds.)

[INSERT INTO BRAND VALUES \('1', 'Acura'\), \('2', 'Alfa Romeo'\), \('3', 'Aston Martin'\), \('4', 'Audi'\), \('5', 'Bentley'\), \('6', 'BMW'\), \('7', 'Brilliance'\), \('8', 'Bugatti'\), \('9', 'Buick'\), \('10', 'BYD'\), \('11', 'Cadillac'\), \('12', 'Changan'\), \('13', 'Chery'\), \('14', 'Chevrolet'\), \('15', 'Chrysler'\), \('16', 'Citroen'\), \('17', 'Daewoo'\), \('18', 'Daihatsu'\), \('19', 'Datsun'\), \('20', 'Dodge'\), \('21', 'Dongfeng'\), \('22', 'FAW'\), \('23', 'Ferrari'\), \('24', 'Fiat'\), \('25', 'Fisker'\), \('26', 'Ford'\), \('27', 'GAZ'\), \('28', 'Geely'\), \('29', 'Genesis'\), \('30', 'GMC'\), \('31', 'Great Wall'\), \('32', 'Haval'\), \('33', 'Holden'\), \('34', 'Honda'\), \('35', 'Hummer'\), \('36', 'Hyundai'\), \('37', 'Infiniti'\), \('38', 'Isuzu'\), \('39', 'Iveco'\), \('40', 'Jaguar'\), \('41', 'Jeep'\), \('42', 'Kia'\), \('43', 'Lamborghini'\), \('44', 'Lancia'\), \('45', 'Land Rover'\), \('46', 'Lexus'\), \('47', 'Lincoln'\), \('48', 'Lotus'\), \('49', 'Marussia'\), \('50', 'Maserati'\), \('51', 'Maserati'\), \('52', 'Mitsubishi'\), \('53', 'Nissan'\), \('54', 'OPEL'\), \('55', 'Porsche'\), \('56', 'Renault'\), \('57', 'Skoda'\), \('58', 'Subaru'\), \('59', 'Suzuki'\), \('60', 'Tata'\), \('61', 'Toyota'\), \('62', 'Vauxhall'\), \('63', 'Volvo'\), \('64', 'Wuling'\), \('65', 'Xiaoyao'\), \('66', 'Yutong'\)](#)

[Edit]

Showing rows 0 - 24 (83 total, Query took 0.0617 seconds.)

SELECT * FROM `BRAND`

	BRAND_ID	BRAND_NAME
<input type="checkbox"/>	1	Acura
<input type="checkbox"/>	2	Alfa Romeo
<input type="checkbox"/>	3	Aston Martin
<input type="checkbox"/>	4	Audi
<input type="checkbox"/>	5	Bentley
<input type="checkbox"/>	6	BMW
<input type="checkbox"/>	7	Brilliance
<input type="checkbox"/>	8	Bugatti
<input type="checkbox"/>	9	Buick
<input type="checkbox"/>	10	BYD
<input type="checkbox"/>	11	Cadillac
<input type="checkbox"/>	12	Changan
<input type="checkbox"/>	13	Chery
<input type="checkbox"/>	14	Chevrolet
<input type="checkbox"/>	15	Chrysler
<input type="checkbox"/>	16	Citroen

9. Created a MODEL table to show the information of each car model.

```
CREATE TABLE MODEL (
    MODEL_ID INTEGER,
    MODEL_NAME VARCHAR(30),
    MODEL_TYPE VARCHAR(30),
    BRAND_ID INTEGER,
    PRIMARY KEY (MODEL_ID),
    FOREIGN KEY (BRAND_ID) REFERENCES BRAND(BRAND_ID));
```

Run SQL query/queries on table sq9376090.BRAND:

```
1 CREATE TABLE MODEL (
2     MODEL_ID INTEGER,
3     MODEL_NAME VARCHAR(30),
4     MODEL_TYPE VARCHAR(30),
5     BRAND_ID INTEGER,
6     PRIMARY KEY (MODEL_ID),
7     FOREIGN KEY (BRAND_ID) REFERENCES BRAND(BRAND_ID));
```

Columns

BRAND_ID	BRAND_NAME
----------	------------

SELECT * SELECT INSERT UPDATE DELETE Clear Format

Get auto-saved query

Show this query here again Retain query box Rollback when finished Enable foreign key checks

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0659 seconds.)

CREATE TABLE MODEL (MODEL_ID INTEGER, MODEL_NAME VARCHAR(30), MODEL_TYPE VARCHAR(30), BRAND_ID INTEGER, PRIMARY KEY (MODEL_ID), FOREIGN KEY (BRAND_ID) REFERENCES BRAND(BRAND_ID))

10. Inserted information for 1101 car models into the MODEL table.

INSERT INTO MODEL

```
VALUES ('1', 'CL', 'Subcompact Cars', '1'),  
('2', 'EL', 'Subcompact Cars', '1'),  
('3', 'ILX', 'Subcompact Cars', '1'),  
('4', 'Integra', 'Subcompact Cars', '1'),  
('5', 'MDX', 'Subcompact Cars', '1'),  
...  
(1122, 'XC90', 'Compact Cars', '83');
```

(1)

('1122', 'XC90', 'Compact Cars', '83');

The screenshot shows the phpMyAdmin interface for the 'BRAND' table. The query was executed successfully, inserting 1101 rows. The columns displayed are BRAND_ID and BRAND_NAME.

```

1 INSERT INTO MODEL
2 VALUES ('1', 'CL', 'Subcompact Cars', '1'),
3 ('2', 'EL', 'Subcompact Cars', '1'),
4 ('3', 'ILX', 'Subcompact Cars', '1'),
5 ('4', 'Integra', 'Subcompact Cars', '1'),
6 ('5', 'MDX', 'Subcompact Cars', '1'),
7 ('6', 'NSX', 'Subcompact Cars', '1'),
8 ('7', 'RDX', 'Subcompact Cars', '1'),
9 ('8', 'RL', 'Subcompact Cars', '1'),
10 ('9', 'RLX', 'Compact Cars', '1'),
11 ('10', 'RSX', 'Compact Cars', '1'),
12 ('11', 'TL', 'Compact Cars', '1'),
13 ('12', 'TLX', 'Compact Cars', '1'),
14 ('13', 'TSX', 'Compact Cars', '1'),
...

```

Below the query results, there are several buttons: SELECT*, SELECT, INSERT, UPDATE, DELETE, Clear, Format. There are also checkboxes for 'Get auto-saved query', 'Bind parameters', 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks'. A 'Go' button is located at the bottom right. The status bar at the bottom indicates the query took 0.1984 seconds.

Showing rows 0 - 24 (1101 total, Query took 0.0605 seconds.)

`SELECT * FROM MODEL`

	MODEL_ID	MODEL_NAME	MODEL_TYPE	BRAND_ID
<input type="checkbox"/>	1	CL	Subcompact Cars	1
<input type="checkbox"/>	2	EL	Subcompact Cars	1
<input type="checkbox"/>	3	ILX	Subcompact Cars	1
<input type="checkbox"/>	4	Integra	Subcompact Cars	1
<input type="checkbox"/>	5	MDX	Subcompact Cars	1
<input type="checkbox"/>	6	NSX	Subcompact Cars	1
<input type="checkbox"/>	7	RDX	Subcompact Cars	1
<input type="checkbox"/>	8	RL	Subcompact Cars	1
<input type="checkbox"/>	9	RLX	Compact Cars	1
<input type="checkbox"/>	10	RSX	Compact Cars	1
<input type="checkbox"/>	11	TL	Compact Cars	1
<input type="checkbox"/>	12	TLX	Compact Cars	1
<input type="checkbox"/>	13	TSX	Compact Cars	1
<input type="checkbox"/>	14	ZDX	Compact Cars	1
<input type="checkbox"/>	15	146	Compact Cars	2

11. Created a DEALER table to show the information of each dealer.

```
CREATE TABLE DEALER (
    DEALER_ID INTEGER,
    DEALER_NAME VARCHAR(30),
    DEALER_STREET VARCHAR(30),
    DEALER_CITY VARCHAR(30),
    DEALER_STATE CHAR(2),
    DEALER_ZIP INTEGER,
    PURCHASE_ID INTEGER,
    CAR_ID INTEGER,
    PRIMARY KEY (DEALER_ID),
    FOREIGN KEY (PURCHASE_ID) REFERENCES PURCHASES(PURCHASE_ID),
    FOREIGN KEY (CAR_ID) REFERENCES CAR(CAR_ID));
```

The screenshot shows the phpMyAdmin interface for a MySQL database named 'sql9376090'. The left sidebar lists tables: information_schema, sql9376090 (containing New, BRAND, CAR, CUSTOMER, DEALER, MODEL, PURCHASES), and MODEL. The main area shows the SQL query for creating the DEALER table. The 'Run SQL query/queries on table sql9376090.MODEL' field contains the provided CREATE TABLE statement. Below it are buttons for SELECT, INSERT, UPDATE, DELETE, Clear, and Format. To the right, a 'Columns' panel shows the columns: MODEL_ID, MODEL_NAME, MODEL_TYPE, and BRAND_ID. At the bottom, there are checkboxes for 'Show this query here again', 'Retain query box', 'Rollback when finished', and 'Enable foreign key checks', along with a 'Go' button.

12. Inserted information for 114 dealers into the DEALER table.

```
INSERT INTO DEALER
VALUES ('1', 'RELIABLE AUTO SALES', '1522 N. ELM PLACE', 'ATLANTA', 'GA',
'303012334', '12437', '917'),
('2', 'R V GENERAL STORE, INC. #2', '3333 N. MERIDIAN AVENUE', 'NEW YORK',
'NY', '100059989', '2255', '7196'),
('3', 'MIDWEST AUTO BROKERS', '1545 SW 29TH ST', 'LOS ANGELES', 'CA',
'902130000', '1111', '7646'),
('4', 'AMERICAN AUTO SALES, LLC', '7129 E. 11TH STREET', 'NEW YORK', 'NY',
'100190000', '2444', '3260'),
```

('5', 'NORRIS AUTO SALES & SERVICE, LLC', '3801 S. BROADWAY', 'CHARLOTTE', 'NC', '282552550', '7915', '12424'),

('114', 'C S MOTORS, LLC', '7915 E. 21ST STREET', 'DECATOR', 'IL', '625252525', '7305', '9379');

The screenshot shows the phpMyAdmin interface for the MODEL table. The SQL query entered is:

```

1 INSERT INTO DEALER
2 VALUES ('1', 'RELIABLE AUTO SALES', '1522 N. ELM PLACE', 'ATLANTA', 'GA', '303012334', '12437', '917'),
3 ('2', 'R V GENERAL STORE, INC. #2', '3333 N. MERIDIAN AVENUE', 'NEW YORK', 'NY', '100059989', '2255', '7196'),
4 ('3', 'MIDWEST AUTO BROKERS', '1545 SW 29TH ST', 'LOS ANGELES', 'CA', '902130000', '1111', '7646'),
5 ('4', 'AMERICAN AUTO SALES, LLC', '7129 E. 11TH STREET', 'NEW YORK', 'NY', '100190000', '2444', '3260'),
6 ('5', 'NORRIS AUTO SALES & SERVICE, LLC', '3801 S. BROADWAY', 'CHARLOTTE', 'NC', '282552550', '7915', '12424'),
7 ('6', 'MASTER AUTO SALES', '3901 MANEY AVE', 'SHERMAN OAKS', 'CA', '914231423', '96', '15539'),
8 ('7', 'D & D USED CARS #3', '1904 GARY BLVD', 'BALTIMORE', 'MD', '212031203', '13014', '10685),
9 ('8', 'CAR MART OF TULSA', '6519 E. 11TH STREET', 'FORT WORTH', 'TX', '761026102', '287', '10189),
10 ('9', 'D A S USED CARS & TRUCKS', '1021 S. MAIN', 'PHOENIX', 'AZ', '850365036', '14621', '3333),
11 ('10', 'T & D MOTOR COMPANY, INC.', '7145 NW 39TH EXPRESSWAY', 'ALLENTOWN', 'PA', '181018101', '10432', '4281),
12 ('11', 'JUSTICE AUTO SALES', '201 SW SHERIDAN ROAD', 'ATLANTA', 'GA', '303310331', '8072', '8421),
13 ('12', 'LEE AUTO SALES', '1300 S. MAIN', 'SAN MATEO', 'CA', '940024002', '1865', '9106),
14 ('13', 'E-Z PAY USED CARS, INC #2', '500 S. 32ND STREET', 'HONOLULU', 'HI', '968426842', '14441', '3621),
15 ('14', 'AUTO FACTORY, LLC', '1123 N. ELM PLACE', 'PORTLAND', 'OR', '972047204', '409', '15174),
16 ('15', 'FAIRWAY MOTOR CARS', '8185 E. 46TH STREET', 'PLAINFIELD', 'IN', '461686168', '8657', '14894)

```

The results show 114 rows inserted. The query took 0.0661 seconds.

The screenshot shows the phpMyAdmin interface for the DEALER table. The results section displays 114 total rows found, with the following data:

DEALER_ID	DEALER_NAME	DEALER_STREET	DEALER_CITY	DEALER_STATE	DEALER_ZIP	PURCHASE_ID	CAR_ID
1	RELIABLE AUTO SALES	1522 N. ELM PLACE	ATLANTA	GA	303012334	12437	917
2	R V GENERAL STORE, INC. #2	3333 N. MERIDIAN AVENUE	NEW YORK	NY	100059989	2255	7196
3	MIDWEST AUTO BROKERS	1545 SW 29TH ST	LOS ANGELES	CA	902130000	1111	7646
4	AMERICAN AUTO SALES, LLC	7129 E. 11TH STREET	NEW YORK	NY	100190000	2444	3260
5	NORRIS AUTO SALES & SERVICE, LLC	3801 S. BROADWAY	CHARLOTTE	NC	282552550	7915	12424
6	MASTER AUTO SALES	3901 MANEY AVE	SHERMAN OAKS	CA	914231423	96	15539
7	D & D USED CARS #3	1904 GARY BLVD	BALTIMORE	MD	212031203	13014	10685
8	CAR MART OF TULSA	6519 E. 11TH STREET	FORT WORTH	TX	761026102	287	10189
9	D A S USED CARS & TRUCKS	1021 S. MAIN	PHOENIX	AZ	850365036	14621	3333
10	T & D MOTOR COMPANY, INC.	7145 NW 39TH EXPRESSWAY	ALLENTOWN	PA	181018101	10432	4281
11	JUSTICE AUTO SALES	201 SW SHERIDAN ROAD	ATLANTA	GA	303310331	8072	8421
12	LEE AUTO SALES	1300 S. MAIN	SAN MATEO	CA	940024002	1865	9106
13	E-Z PAY USED CARS, INC #2	500 S. 32ND STREET	HONOLULU	HI	968426842	14441	3621
14	AUTO FACTORY, LLC	1123 N. ELM PLACE	PORTLAND	OR	972047204	409	15174
15	FAIRWAY MOTOR CARS	8185 E. 46TH STREET	PLAINFIELD	IN	461686168	8657	14894

13. Created a COURIER table to show the information of each courier.

CREATE TABLE COURIER (
COURIER_ID INTEGER,

```

COURIER_STREET VARCHAR(30),
COURIER_CITY VARCHAR(30),
COURIER_STATE CHAR(2),
COURIER_ZIP INTEGER,
DELIVERY_ID INTEGER,
PRIMARY KEY (COURIER_ID));

```

The screenshot shows the phpMyAdmin interface for a database named 'sql9376090'. The left sidebar lists tables: information_schema, sql9376090 (which contains New, BRAND, CAR, COURIER, CUSTOMER, DEALER, MODEL, PURCHASES). The main area shows the SQL query for creating the 'COURIER' table:

```

CREATE TABLE COURIER (
  COURIER_ID INTEGER,
  COURIER_STREET VARCHAR(30),
  COURIER_CITY VARCHAR(30),
  COURIER_STATE CHAR(2),
  COURIER_ZIP INTEGER,
  DELIVERY_ID INTEGER,
  PRIMARY KEY (COURIER_ID));

```

To the right, a 'Columns' panel lists the table's columns with their types: DEALER_ID, DEALER_NAME, DEALER_STREET, DEALER_CITY, DEALER_STATE, DEALER_ZIP, PURCHASE_ID, and CAR_ID.

Below the query, there are buttons for SELECT*, SELECT, INSERT, UPDATE, DELETE, Clear, and Format. A note says 'Get auto-saved query' and 'Bind parameters'. At the bottom, it says 'MySQL returned an empty result set (i.e. zero rows). (Query took 0.0654 seconds.)' and shows the full CREATE TABLE statement again.

14. Inserted information for 30 couriers into the COURIER table.

```

INSERT INTO COURIER
VALUES ('1', '12462 Alpha Lane', 'Redding', 'CA', '96003', '1'),
('2', '23 Laurel St', 'Manchester', 'CT', '6040', '2'),
('3', '2008 Spruce St', 'Philadelphia', 'PA', '19103', '3'),
('4', '163 Shaw Ave', 'Irvington', 'NJ', '7111', '4'),
('5', 'Newark International Airport', 'Newark', 'NJ', '7101', '5'),
...
('30', '4320 Mentone St Suite 4', 'San Diego', 'CA', '92107', '30');

```

phpMyAdmin

Server: sq9.freemysqlhosting.net » Database: sq9376090 » Table: DEALER

Browse Structure SQL Search Insert Export Import Operations

Run SQL query/queries on table sq9376090.DEALER:

```

1 INSERT INTO COURIER
2 VALUES ('1', '12462 Alpha Lane', 'Redding', 'CA', '96003', '1'),
3 ('2', '23 Laurel St', 'Manchester', 'CT', '6040', '2'),
4 ('3', '2008 Spruce St', 'Philadelphia', 'PA', '19103', '3'),
5 ('4', '163 Shaw Ave', 'Irvington', 'NJ', '7111', '4'),
6 ('5', 'Newark International Airport', 'Newark', 'NJ', '7101', '5'),
7 ('6', '24 Main', 'Peabody', 'MA', '1960', '6'),
8 ('7', '2615 East Avenue E', 'Arlington', 'TX', '76011', '7'),
9 ('8', 'Forest Park', 'Forest Park', 'IL', '60130', '8'),
10 ('9', '127 East Main Street', 'New Freedom', 'PA', '17349', '9'),
11 ('10', '225 County Road 3112', 'Atlanta', 'TX', '75551', '10'),
12 ('11', '5178 East Apple Ave', 'Muskegon', 'MI', '49442', '11'),
13 ('12', '526 Park Plaza', 'Charlottesville', 'VA', '22902', '12'),
14 ('13', 'P.O. Box 352', 'Eagleville', 'PA', '19408', '13'),
15 ('14', '5501 Airport Way South Suite 6', 'Seattle', 'WA', '98108', '15'),
16 ('15', '410 Detroit Ave...', 'Newport News', 'VA', '23605', '16')

```

Columns

DEALER_ID	DEALER_NAME	DEALER_STREET	DEALER_CITY	DEALER_STATE	DEALER_ZIP	PURCHASE_ID	CAR_ID
-----------	-------------	---------------	-------------	--------------	------------	-------------	--------

SELECT * SELECT INSERT UPDATE DELETE Clear Format

Get auto-saved query

Bind parameters

[Delimiter :] Show this query here again Retain query box Rollback when finished Enable foreign key checks

Hide query box

30 rows inserted. (Query took 0.0683 seconds.)

INSERT INTO COURIER VALUES ('1', '12462 Alpha Lane', 'Redding', 'CA', '96003', '1'), ('2', '23 Laurel St', 'Manchester', 'CT', '6040', '2'), ('3', '2008 Spruce St', 'Philadelphia', 'PA', '19103', '3'), ('4', '163 Shaw Ave', 'Irvington', 'NJ', '7111', '4'), ('5', 'Newark International Airport', 'Newark', 'NJ', '7101', '5'), ('6', '24 Main', 'Peabody', 'MA', '1960', '6'), ('7', '2615 East Avenue E', 'Arlington', 'TX', '76011', '7'), ('8', 'Forest Park', 'Forest Park', 'IL', '60130', '8'), ('9', '127 East Main Street', 'New Freedom', 'PA', '17349', '9'), ('10', '225 County Road 3112', 'Atlanta', 'TX', '75551', '10'), ('11', '5178 East Apple Ave', 'Muskegon', 'MI', '49442', '11'), ('12', '526 Park Plaza', 'Charlottesville', 'VA', '22902', '12'), ('13', 'P.O. Box 352', 'Eagleville', 'PA', '19408', '13'), ('14', '5501 Airport Way South Suite 6', 'Seattle', 'WA', '98108', '15'), ('15', '410 Detroit Ave...', 'Newport News', 'VA', '23605', '16')

phpMyAdmin

Server: sq9.freemysqlhosting.net » Database: sq9376090 » Table: COURIER

Browse Structure SQL Search Insert Export Import Operations

Showing rows 0 - 24 (30 total, Query took 0.0606 seconds.)

SELECT * FROM `COURIER`

Number of rows: 25 Filter rows: Search this table Sort by key: None

	COURIER_ID	COURIER_STREET	COURIER_CITY	COURIER_STATE	COURIER_ZIP	DELIVERY_ID
<input type="checkbox"/>	1	12462 Alpha Lane	Redding	CA	96003	1
<input type="checkbox"/>	2	23 Laurel St	Manchester	CT	6040	2
<input type="checkbox"/>	3	2008 Spruce St	Philadelphia	PA	19103	3
<input type="checkbox"/>	4	163 Shaw Ave	Irvington	NJ	7111	4
<input type="checkbox"/>	5	Newark International Airport	Newark	NJ	7101	5
<input type="checkbox"/>	6	24 Main	Peabody	MA	1960	6
<input type="checkbox"/>	7	2615 East Avenue E	Arlington	TX	76011	7
<input type="checkbox"/>	8	7421 West Madison	Forest Park	IL	60130	8
<input type="checkbox"/>	9	127 East Main Street	New Freedom	PA	17349	9
<input type="checkbox"/>	10	225 County Road 3112	Atlanta	TX	75551	10
<input type="checkbox"/>	11	5178 East Apple Ave	Muskegon	MI	49442	11
<input type="checkbox"/>	12	526 Park Plaza	Charlottesville	VA	22902	12
<input type="checkbox"/>	13	P.O. Box 352	Eagleville	PA	19408	13
<input type="checkbox"/>	14	9601 Jefferson Avenue	Newport News	VA	23605	14
<input type="checkbox"/>	15	5501 Airport Way South Suite 6	Seattle	WA	98108	15

15. Created a DELIVERY table to show the information of each delivery.

```

CREATE TABLE DELIVERY (
    DELIVERY_ID INTEGER,
    DELIVERY_TYPE VARCHAR(30),
    COURIER_ID INTEGER,
    CAR_ID INTEGER,
    CUS_ID INTEGER,
    PRIMARY KEY (DELIVERY_ID),
    FOREIGN KEY (COURIER_ID) REFERENCES COURIER(COURIER_ID),
    FOREIGN KEY (CAR_ID) REFERENCES CAR(CAR_ID),

```

FOREIGN KEY (CUS_ID) REFERENCES CUSTOMER(CUS_ID));

The screenshot shows the phpMyAdmin interface for a database named 'sql9376090'. In the left sidebar, the 'DELIVERY' table is selected. The main area contains the SQL query:

```

1 CREATE TABLE DELIVERY (
2     DELIVERY_ID INTEGER,
3     DELIVERY_TYPE VARCHAR(30),
4     COURIER_ID INTEGER,
5     CAR_ID INTEGER,
6     CUS_ID INTEGER,
7     PRIMARY KEY (DELIVERY_ID),
8     FOREIGN KEY (COURIER_ID) REFERENCES COURIER(COURIER_ID),
9     FOREIGN KEY (CAR_ID) REFERENCES CAR(CAR_ID),
10    FOREIGN KEY (CUS_ID) REFERENCES CUSTOMER(CUS_ID));
11

```

The 'Columns' panel on the right lists the columns: COURIER_ID, COURIER_STREET, COURIER_CITY, COURIER_STATE, COURIER_ZIP, and DELIVERY_ID.

At the bottom, the message 'MySQL returned an empty result set (i.e. zero rows). (Query took 0.0693 seconds.)' is displayed.

16. Inserted information for 30 deliveries into the DELIVERY table.

INSERT INTO DELIVERY

```

VALUES ('1', 'truck transport', '1', '917', '15087'),
('2', 'truck transport', '2', '7196', '9717'),
('3', 'rail freight', '3', '7646', '27941'),
('4', 'truck transport', '4', '3260', '22685'),
('5', 'air transport', '5', '12424', '21859'),
...
('30', 'truck transport', '30', '8911', '13594');

```

The screenshot shows the phpMyAdmin interface for a database named 'sql9376090'. In the left sidebar, the 'CAR' table is selected. The main area contains the SQL query:

```

18 ('17', 'truck transport', '17', '5464', '2676'),
19 ('18', 'truck transport', '18', '4898', '1611'),
20 ('19', 'truck transport', '19', '10707', '19364'),
21 ('20', 'truck transport', '20', '3877', '4997'),
22 ('21', 'rail freight', '21', '8127', '1867'),
22 ('22', 'truck transport', '22', '12938', '3361'),
24 ('23', 'truck transport', '23', '15837', '1537'),
25 ('24', 'truck transport', '24', '15183', '29774'),
25 ('25', 'truck transport', '25', '13496', '5067'),
27 ('26', 'truck transport', '26', '17966', '1201'),
27 ('27', 'truck transport', '27', '13679', '1897),
28 ('28', 'truck transport', '28', '16576', '18847),
30 ('29', 'truck transport', '29', '16196', '25240'),
31 ('30', 'truck transport', '30', '8911', '13594');

```

The 'Columns' panel on the right lists the columns: CAR_ID, CAR_INTERIORTYPE, CAR_DRIVETRAIN, CAR_ENGINE, CAR_SEATING, CAR_STATUS, CAR_CONDITION, CAR_AGE, CAR_TRANSMISSION, CAR_EXTCOLOR, CAR_INTCOLOR, DEALER_ID, and BRAND_ID.

At the bottom, the message '30 rows inserted. (Query took 0.0649 seconds.)' is displayed.

Showing rows 0 - 24 (30 total, Query took 0.0627 seconds.)

SELECT * FROM `DELIVERY`

	DELIVERY_ID	DELIVERY_TYPE	COURIER_ID	CAR_ID	CUS_ID
<input type="checkbox"/>	1	truck transport	1	917	15087
<input type="checkbox"/>	2	truck transport	2	7196	9717
<input type="checkbox"/>	3	rail freight	3	7646	27941
<input type="checkbox"/>	4	truck transport	4	3260	22685
<input type="checkbox"/>	5	air transport	5	12424	21859
<input type="checkbox"/>	6	truck transport	6	15539	13072
<input type="checkbox"/>	7	rail freight	7	10685	2761
<input type="checkbox"/>	8	truck transport	8	10189	10385
<input type="checkbox"/>	9	truck transport	9	3333	29360
<input type="checkbox"/>	10	rail freight	10	4281	25265
<input type="checkbox"/>	11	truck transport	11	8421	1388
<input type="checkbox"/>	12	rail freight	12	9106	10213
<input type="checkbox"/>	13	truck transport	13	3621	6927
<input type="checkbox"/>	14	air transport	14	15174	50
<input type="checkbox"/>	15	truck transport	15	14894	6752

Data in Google Sheets:

<https://docs.google.com/spreadsheets/d/1z4fG1BVJgQ5GKRabJgSIIjU57uib2-bo9z4LgPhfOSA/edit?ts=5fa6bf93#gid=128881398>

SQL QUERIES TO RETRIEVE DATA

1. When the user clicks on a certain brand (let's say BMW) then the models for that specific brand is displayed

```
SELECT model.MODEL_NAME as 'Model' FROM model JOIN brand ON  
model.BRAND_ID = brand.BRAND_ID WHERE brand.BRAND_NAME =  
'BMW'
```

Showing rows 0 - 24 (29 total, Query took 0.0019 seconds.)

```
SELECT model.MODEL_NAME as 'Model' FROM model JOIN brand ON model.BRAND_ID = brand.BRAND_ID WHERE brand.BRAND_NAME = 'BMW'
```

1 < > >> | Show all | Number of rows: 25 | Filter rows: Search this table | Sort by

+ Options

Model

- 1 series
- 2 series
- 3 series
- 4 series
- 5 series
- 6 series
- 7 series
- 8 series
- i3
- i8
- M2
- M3
- M4
- M5
- M6
- X1
- X2
- X3
- X3 M
- X4
- X4 M
- X5

- When the user clicks on a certain model (Let's say X5), then the specific information including the price regarding that model is displayed

NOTE: We did not have purchase price as a column in our car table, it was only in our purchases table. We took the min and max of the purchase prices in the purchases table and added the purchase price column to the car table using a random insert of numbers between the min and max price identified in the purchases table. As a result the prices for the cars in the car table may not reflect true world instances of the price of these brands/models of cars, but they exist in the table so we can run the queries. Also, we do not have any instances of the X5 in our car table but we do have instances of the BMW 3 series, so I will use the model 3 series for these example queries rather than the X5.

```
ALTER TABLE car ADD COLUMN PURCHASE_PRICE int AFTER CAR_ID;
UPDATE car SET car.PURCHASE_PRICE = FLOOR(76799 *
RAND())+15076;
```

```
ALTER TABLE car ADD COLUMN PURCHASE_PRICE int AFTER CAR_ID
UPDATE car SET car.PURCHASE_PRICE = FLOOR(76799 * RAND())+15076
```

```
SELECT brand.BRAND_NAME AS 'Brand', model.MODEL_NAME AS
'Model', car.PURCHASE_PRICE AS 'Price', dealer.DEALER_NAME as
'Selling Dealer', car.CAR_INTERIORTYPE as 'Interior',
car.CAR_DRIVETRAIN as 'Drive Train', car.CAR_ENGINE as 'Engine',
car.CAR_SEATING as 'Seating', car.CAR_STATUS as 'New or Used',
car.CAR_CONDITION as 'Condition', car.CAR_AGE as 'Age',
car.CAR_TRANSMISSION as 'Transmission', car.CAR_EXTCOLOR as
'Exterior Color', car.CAR_INTCOLOR as 'Interior Color' FROM dealer JOIN
car ON dealer.CAR_ID = car.CAR_ID JOIN model on car.MODEL_ID =
model.MODEL_ID JOIN brand ON model.BRAND_ID = brand.BRAND_ID
WHERE model.MODEL_NAME = '3 series'
```

Showing rows 0 - 24 (114 total, Query took 0.0066 seconds.)

```
SELECT brand.BRAND_NAME AS 'Brand', model.MODEL_NAME AS 'Model', car.PURCHASE_PRICE AS 'Price', dealer.DEALER_NAME AS 'Selling Dealer', car.CAR_INTERIORTYPE AS 'Interior', car.CAR_DRIVETRAIN AS 'Drive Train', car.CAR_ENGINE as 'Engine', car.CAR_SEATING as 'Seating', car.CAR_STATUS as 'New or Used', car.CAR_CONDITION as 'Condition', car.CAR_AGE as 'Age', car.CAR_TRANSMISSION as 'Transmission', car.CAR_EXTCOLOR as 'Exterior Color', car.CAR_INTCOLOR as 'Interior Color' FROM dealer JOIN car ON dealer.CAR_ID = car.CAR_ID JOIN model on car.MODEL_ID = model.MODEL_ID JOIN brand ON model.BRAND_ID = brand.BRAND_ID WHERE model.MODEL_NAME = '3 series'
```

Profiling | [Edit inline](#) | [Edit](#) | [Explain SQL](#) | [Create PHP code](#) | [Refresh](#)

1 > >> | Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

Brand	Model	Price	Selling Dealer	Interior	Drive Train	Engine	Seating	New or Used	Condition	Age	Transmission	Exterior Color	Interior Color
BMW	3 series	65986	RELIABLE AUTO SALES	325i 2dr Convertible	(2.5L 6-cyl 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Iceland Green Metallic	Gray
BMW	3 series	84790	R V GENERAL STORE, INC #2	325i 4dr Sedan	(2.5L 6-cyl 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Laguna Green Metallic	Gray
BMW	3 series	40998	MIDWEST AUTO BROKERS	325iX 4dr Sedan AWD	(2.5L 6-cyl AWD 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Glacier Blue Metallic	Black
BMW	3 series	79593	AMERICAN AUTO SALES, LLC	325is 2dr Coupe	(2.5L 6-cyl 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Sterling Silver Metallic	Gray
BMW	3 series	51040	NORRIS AUTO SALES & SERVICE, L	325i 2dr Coupe	(2.5L 6-cyl 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Calypso Red Metallic	Black
BMW	3 series	64206	MASTER AUTO SALES	325iX 2dr Coupe AWD	(2.5L 6-cyl AWD 5-speed Manual)	I6	4	Used	Bad	30	5-speed manual	Calypso Red Metallic	Black
BMW	3 series	33124	D & D USED CARS #3	M3 2dr Coupe	(2.5L 6-cyl 5-speed Manual)	I4	4	Used	Bad	30	5-speed manual	Samoa Blue Metallic	Black
BMW	3 series	58727	CAR MART OF TULSA	318i 4dr Sedan	(1.8L 4-cyl 5-speed Manual)	I4	4	Used	Bad	28	5-speed manual	Brocade Red Metallic	Black
BMW	3 series	90077	D A S USED CARS & TRUCKS	325i 4dr Sedan	(2.5L 6-cyl 5-speed Manual)	I6	4	Used	Bad	28	5-speed manual	Samoa Blue Metallic	Black
BMW	3 series	35321	T & D MOTOR COMPANY, INC	318i 2dr Convertible	(1.8L 4-cyl 5-speed Manual)	I4	4	Used	Bad	28	5-speed manual	Samoa Blue Metallic	Black

3. When the user clicks on the Exterior of a certain model (Let's say X5) then all the color options are displayed

```
SELECT car.CAR_EXTCOLOR as 'Exterior Colors Available' FROM car JOIN model ON car.MODEL_ID = model.MODEL_ID WHERE model.MODEL_NAME = '3 series'
```

Showing rows 0 - 24 (166 total, Query took 0.0018 seconds.)

```
SELECT car.CAR_EXTCOLOR as 'Exterior Colors Available' FROM car JOIN model ON car.MODEL_ID = model.MODEL_ID WHERE model.MODEL_NAME = '3 series'
```

Prof

1 > >> | Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

Exterior Colors Available

- Monaco Blue Metallic
- Alpine White
- Imola Red
- Crimson Red
- Bright Red
- Carbon Black Metallic
- Black
- Jet Black
- Jet Black
- Black Sapphire Metallic
- Liquid Blue Metallic
- Iceland Green Metallic
- Platinum Bronze Metallic
- Black
- Crimson Red
- Liquid Blue Metallic
- Electric Red

4. When the user sets up search conditions as “used Red cars, with Gray interior color, and price below 50000” then all the car options are displayed

```

SELECT a.* , b.BRAND_NAME, c.MODEL_NAME FROM CAR as a
JOIN BRAND as b ON a.BRAND_ID=b.BRAND_ID
JOIN MODEL as c ON a.MODEL_ID=c.MODEL_ID
WHERE a.CAR_STATUS="Used"
AND a.CAR_EXTCOLOR like "%Red%"
AND a.CAR_INTCOLOR like "%Gray%"
AND a.PURCHASE_PRICE < 50000

```

CAR_ID	PURCHASE_PRICE	CAR_INTERIORTYPE	CAR_DRIVETRAIN	CAR_ENGINE	CAR_SEATING	CAR_STATUS	CAR_CONDITION	CAR_AGE	CAR_TRANSMISSION
278	43794	328i 2dr Convertible	(2.8L 6-cyl. 5-speed Manual)	I6	4	Used	Bad	24	5-speed manual
854	26559	Lariat 4dr Extended Cab LB (4.	(4.6L V8 4-speed Automatic)	V8	4	Used	Bad	20	4-speed automatic
1637	46322	XL 4dr SuperCrew 6.5 ft. SB (2	(2.7L V6 Twin-turbo 6-speed Au	V6	6	Used	Good	5	6-speed shiftable automatic
6866	48711	328i 2dr Convertible	(2.8L 6-cyl. 5-speed Manual)	I6	4	Used	Bad	22	5-speed manual
15020	42772	XL 4dr SuperCrew 4WD 5.5 ft. S	(3.5L V6 FFV 4x4 6-speed Autom	V6	6	Used	Good	5	6-speed shiftable automatic
16038	49844	Lariat 4dr SuperCab 4WD 8 ft.	(5.0L V8 FFV 4x4 6-speed Autom	V8	6	Used	Good	5	6-speed shiftable automatic
17743	36747	Lariat 4dr Extended Cab SB (4.	(4.6L V8 4-speed Automatic)	V8	4	Used	Bad	20	4-speed automatic

CAR_AGE	CAR_TRANSMISSION	CAR_EXTCOLOR	CAR_INTCOLOR	DEALER_ID	BRAND_ID	MODEL_ID	CUS_ID	PURCHASE_ID	BRAND_NAME	MODEL_NAME
24	5-speed manual	Imola Red	Gray	55	6	92	15243	13973	BMW	3 series
20	4-speed automatic	Dark Toreador Red Clearcoat Me	Dark Earth Gray/Medium Earth G	6	26	370	13247	10849	Ford	F-150
5	6-speed shiftable automatic	Rapid Red Metallic Tinted Clea	Dark Gray	88	26	370	5084	11927	Ford	F-150
22	5-speed manual	Siena Red Metallic	Gray	99	6	92	22486	11135	BMW	3 series
5	6-speed shiftable automatic	Rapid Red Metallic Tinted Clea	Dark Gray	28	26	370	2172	8565	Ford	F-150
5	6-speed shiftable automatic	Rapid Red Metallic Tinted Clea	Dark Gray	98	26	370	277	12099	Ford	F-150
20	4-speed automatic	Dark Toreador Red Clearcoat Me	Dark Earth Gray/Medium Earth G	98	26	370	5603	13538	Ford	F-150

5. When the sales manager (under administration environment) wants to know purchase details on “Cash” payment transactions by clicking “Cash”, then all the purchase details, including car information are displayed

```

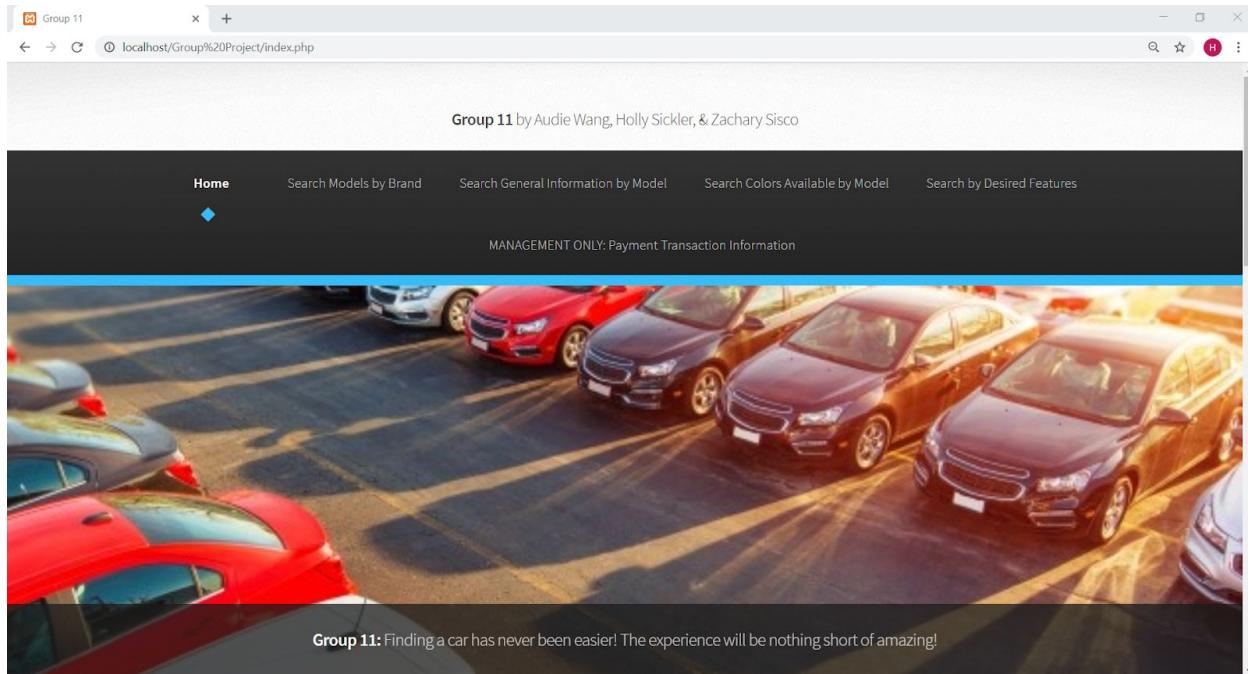
SELECT a.* , b.* , c.BRAND_NAME, d.MODEL_NAME FROM PURCHASES AS a
JOIN CAR as b ON a.CAR_ID=b.CAR_ID
JOIN BRAND as c ON b.BRAND_ID=c.BRAND_ID
JOIN MODEL as d ON b.MODEL_ID=d.MODEL_ID
WHERE a.PURCHASE_METHOD="Cash"

```

PURCHASE_ID	PURCHASE_METHOD	PURCHASE_PRICE	CUS_ID	CAR_ID	CAR_ID	PURCHASE_PRICE	CAR_INTERIORTYPE	CAR_DRIVETRAIN	CAR_ENGINE	CAR_SEATING	CAR_STATI
403	CASH	27265	5126	4093	4093	16799	328i 2dr Coupe (3.0L 6cyl 6M)	(3.0L 6-cyl. 6-speed Manual)	I6	4	Used
9165	CASH	50755	21197	7318	7318	67258	XL 2dr Regular Cab SB (4.9L 6c	(4.9L 6-cyl. 5-speed Manual)	I6	4	Used
9650	CASH	34580	3094	3055	3055	73136	323i 4dr Sedan	(2.5L 6-cyl. 5-speed Manual)	I6	4	Used
12591	CASH	19389	7609	19678	19678	17072	XL 4dr SuperCab 4WD 6.5 ft. SB	(3.5L V6 FFV 4x4 6-speed Autom	V6	6	Used

DATABASE APPLICATION

Below is an image of the Group 11 database application home page:



Several files were created in order to create this database application:

A screenshot of a Windows File Explorer window showing the contents of a "Group Project" folder. The folder path is "This PC > OS (C) > xampp > htdocs > Group Project". The table lists the following files and their details:

Name	Date modified	Type	Size
assets	12/11/2020 1:26 PM	File folder	
images	12/11/2020 11:28 PM	File folder	
assets	12/12/2020 12:04 AM	Compressed (zipp...)	1,331 KB
connect	12/11/2020 2:53 PM	PHP File	1 KB
html5up-arcana	12/11/2020 9:43 PM	Compressed (zipp...)	1,404 KB
images	12/11/2020 11:55 PM	Compressed (zipp...)	410 KB
index	12/11/2020 11:03 PM	PHP File	6 KB
project	12/11/2020 2:27 PM	SQL File	225 KB
Query01	12/11/2020 11:01 PM	PHP File	3 KB
Query1	12/11/2020 11:01 PM	PHP File	4 KB
Query002	12/11/2020 11:02 PM	PHP File	3 KB
Query02	12/11/2020 11:02 PM	PHP File	4 KB
Query2	12/11/2020 11:02 PM	PHP File	4 KB
Query003	12/11/2020 11:02 PM	PHP File	3 KB
Query03	12/11/2020 11:02 PM	PHP File	3 KB
Query3	12/11/2020 11:03 PM	PHP File	4 KB
Query04	12/11/2020 11:00 PM	PHP File	4 KB
Query4	12/11/2020 11:00 PM	PHP File	3 KB
Query05	12/11/2020 10:59 PM	PHP File	4 KB
Query5	12/11/2020 11:00 PM	PHP File	3 KB

To create the database application:

First, an html template, Arcana, was selected and downloaded from <https://html5up.net/>. The folder from the download was moved into a folder named Group Project, located in the htdocs folder on the computer. The index of the html template was converted from an html file to a PHP file. Then a connect PHP file was created to link the project database to the queries that would be placed in the html template to operate the application. The project database was dumped into an SQL file which was also placed in the Group Project folder in the htdocs folder. The index file of the downloaded html template was edited as desired to reflect the information for the project rather than the pre-filled information. Part of the editing of the index document included creating links that referenced the other PHP files which were going to be created for the 5 queries to be shown in the database application. The default images on the home page were also updated to reflect the desired project images by replacing the default images in the html template images folder. Next, the 5 queries shown earlier in this report were transformed into html code and entered into the downloaded html template. This was done by copying the downloaded index file for the template and replacing portions of it with the query information and repeating for each of the five queries. These PHP files for each of the 5 queries were named according to the referenced name in the link created in the index file. Certain queries required multiple files because they required the use of more than one link (for example when searching by model, the user first needs to select the brand so they can then select the model). The database application was continuously tested during creation by visiting localhost/Group Project/index.php. In the application, links to each of the 5 queries can be seen across the top.

Sample Query: Search Models by Brand (example BMW)

Search Models by Brand

- Acura
- Alfa Romeo
- Aston Martin
- Audi
- Bentley
- BMW
- Brilliance
- Bugatti
- Buick
- BYD

Search Models by Brand

Models - BMW

- 1 series
- 2 series
- 3 series
- 4 series
- 5 series
- 6 series
- 7 series
- 8 series
- i3
- i8

Sample PHP File:

```

Query01 - Notepad
File Edit Format View Help

<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT model.MODEL_NAME FROM model JOIN brand on model.BRAND_ID = brand.BRAND_ID WHERE brand.BRAND_NAME = 'BMW'");
echo("<table>");
echo("<tr> <th> Models - BMW </th> </tr>");
while($row = mysqli_fetch_assoc($result)) {
    echo"<tr> <td> {$row['MODEL_NAME']} </td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>
</p>

```

REFERENCES

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3. <https://www.kbb.com/>
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5. Coronel, C., & Morris, S. (2019). Database systems: design, implementation, and management. Boston: Cengage.
6. cardatabase.teoalida.com
7. <https://www.briandunning.com/sample-data/>
8. <http://tiresaddict.com/help/databases/cars/>
9. <https://www.fueleconomy.gov/feg/ws/index.shtml>
10. <http://www.autodealerlist.com/Sample-Data.html>
11. <https://www.odditysoftware.com/page-datasales230.htm>
12. <https://html5up.net/>

APPENDIX

Connect file for the database application:

```
<?php
$linkID = mysqli_connect("localhost", "root", "") or die("cannot connect
to the server");
mysqli_select_db($linkID, "project");
?>
```

5 Queries in html format used in the PHP files for the database application:

```
<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT model.MODEL_NAME FROM model JOIN
brand ON model.BRAND_ID = brand.BRAND_ID WHERE brand.BRAND_NAME = 'BMW'");
echo("<table>");
echo("<tr> <th> Models - BMW </th> </tr>");
while($row = mysqli_fetch_assoc($result)) {
    echo"<tr> <td> {$row['MODEL_NAME']} </td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>
```

```
<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT brand.BRAND_NAME,
model.MODEL_NAME, car.PURCHASE_PRICE, dealer.DEALER_NAME,
car.CAR_INTEIORTYPE, car.CAR_DRIVETRAIN, car.CAR_ENGINE, car.CAR_SEATING,
car.CAR_STATUS, car.CAR_CONDITION, car.CAR_AGE, car.CAR_TRANSMISSION,
car.CAR_EXTCOLOR, car.CAR_INTCOLOR FROM dealer JOIN car ON dealer.CAR_ID =
car.CAR_ID JOIN model ON car.MODEL_ID = model.MODEL_ID JOIN brand ON
model.BRAND_ID = brand.BRAND_ID WHERE model.MODEL_NAME = '3 series'
");
echo("<table>");
echo("<tr> <td> Brand </td> <td> Model </td> <td> Price </td> <td> Selling
Dealer</td> <td>Interior</td> <td>Drive Train</td> <td>Engine</td>
<td>Seating</td> <td>New or Used</td> <td>Condition</td> <td>Age</td>
<td>Transmission</td> <td>Exterior Color</td> <td>Interior Color</td>
</tr>");
```

while(\$row = mysqli_fetch_assoc(\$result)) {

```

        echo"<tr> <td>{$row['BRAND_NAME']}</td>
<td>{$row['MODEL_NAME']}</td> <td>{$row['PURCHASE_PRICE']}</td>
<td>{$row['DEALER_NAME']}</td> <td>{$row['CAR_INTERIORTYPE']}</td>
<td>{$row['CAR_DRIVETRAIN']}</td> <td>{$row['CAR_ENGINE']}</td>
<td>{$row['CAR_SEATING']}</td> <td>{$row['CAR_STATUS']}</td>
<td>{$row['CAR_CONDITION']}</td> <td>{$row['CAR_AGE']}</td>
<td>{$row['CAR_TRANSMISSION']}</td> <td>{$row['CAR_EXTCOLOR']}</td>
<td>{$row['CAR_INTCOLOR']}</td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>
```

```

<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT car.CAR_EXTCOLOR FROM car JOIN
model ON car.MODEL_ID = model.MODEL_ID WHERE model.MODEL_NAME = '3
series'");
echo("<table>");
echo("<tr> <th> Exterior Colors Available </th> </tr>");
while($row = mysqli_fetch_assoc($result)) {
    echo"<tr> <td> {$row['CAR_EXTCOLOR']} </td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>
```

```

<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT a.*, b.BRAND_NAME, c.MODEL_NAME
FROM CAR as a
JOIN BRAND as b ON a.BRAND_ID=b.BRAND_ID
JOIN MODEL as c ON a.MODEL_ID=c.MODEL_ID
WHERE a.CAR_STATUS='Used'
AND a.CAR_EXTCOLOR like '%Red%'
AND a.CAR_INTCOLOR like '%Gray%'
AND a.PURCHASE_PRICE < 50000
");
echo("<table>");
echo("<tr> <td>Car ID</td> <td>Price</td> <td>Interior</td> <td>Drive
Train</td> <td>Engine</td> <td>Seating</td> <td>Status</td>
<td>Condition</td> <td>Age</td> <td>Transmission</td> <td>Exterior
Color</td> <td>Interior Color</td> <td>Dealer ID</td> <td>Brand ID</td>
```

```

<td>Model ID</td> <td>Customer ID</td> <td>Purchase ID</td> <td>Brand
Name</td> <td>Model Name</td> </tr>");
while($row = mysqli_fetch_assoc($result)) {
    echo"<tr> <td>{$row['CAR_ID']}</td>
<td>{$row['PURCHASE_PRICE']}</td> <td>{$row['CAR_INTEIORTYPE']}</td>
<td>{$row['CAR_DRIVETRAIN']}</td> <td>{$row['CAR_ENGINE']}</td>
<td>{$row['CAR_SEATING']}</td> <td>{$row['CAR_STATUS']}</td>
<td>{$row['CAR_CONDITION']}</td> <td>{$row['CAR_AGE']}</td>
<td>{$row['CAR_TRANSMISSION']}</td> <td>{$row['CAR_EXTCOLOR']}</td>
<td>{$row['CAR_INTCOLOR']}</td> <td>{$row['DEALER_ID']}</td>
<td>{$row['BRAND_ID']}</td> <td>{$row['MODEL_ID']}</td>
<td>{$row['CUS_ID']}</td> <td>{$row['PURCHASE_ID']}</td>
<td>{$row['BRAND_NAME']}</td> <td>{$row['MODEL_NAME']}</td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>

```

```

<?php
include("connect.php");
$result = mysqli_query($linkID, "SELECT a.*, b.*, c.BRAND_NAME,
d.MODEL_NAME FROM PURCHASES AS a
JOIN CAR as b ON a.CAR_ID=b.CAR_ID
JOIN BRAND as c ON b.BRAND_ID=c.BRAND_ID
JOIN MODEL as d ON b.MODEL_ID=d.MODEL_ID
WHERE a.PURCHASE_METHOD='Cash'
");
echo("<table>");
echo("<tr> <td>Purchase ID</td> <td>Purchase Method</td> <td>Price</td>
<td>Customer ID</td> <td>Car ID</td> <td>Car ID</td> <td>Price</td>
<td>Interior Type</td> <td>Drive Train</td> <td>Car Engine</td>
<td>Seating</td> <td>Status</td> <td>Condition</td> <td>Age</td>
<td>Transmission</td> <td>Exterior Color</td> <td>Interior Color</td>
<td>Dealer ID</td> <td>Brand ID</td> <td>Model ID</td> <td>Customer
ID</td> <td>Purchase ID</td> <td>Brand Name</td> <td>Model Name</td>
</tr>");
while($row = mysqli_fetch_assoc($result)) {
    echo"<tr> <td>{$row['PURCHASE_ID']}</td>
<td>{$row['PURCHASE_METHOD']}</td> <td>{$row['PURCHASE_PRICE']}</td>
<td>{$row['CUS_ID']}</td> <td>{$row['CAR_ID']}</td>
<td>{$row['CAR_ID']}</td> <td>{$row['PURCHASE_PRICE']}</td>
<td>{$row['CAR_INTEIORTYPE']}</td> <td>{$row['CAR_DRIVETRAIN']}</td>
<td>{$row['CAR_ENGINE']}</td> <td>{$row['CAR_SEATING']}</td>
<td>{$row['CAR_STATUS']}</td> <td>{$row['CAR_CONDITION']}</td>

```

```
<td>{$row['CAR_AGE']}</td> <td>{$row['CAR_TRANSMISSION']}</td>
<td>{$row['CAR_EXTCOLOR']}</td> <td>{$row['CAR_INTCOLOR']}</td>
<td>{$row['DEALER_ID']}</td> <td>{$row['BRAND_ID']}</td>
<td>{$row['MODEL_ID']}</td> <td>{$row['CUS_ID']}</td>
<td>{$row['PURCHASE_ID']}</td> <td>{$row['BRAND_NAME']}</td>
<td>{$row['MODEL_NAME']}</td> </tr>";
}
echo("</table>");
mysqli_close($linkID);
?>
```