I. Team Name: Data Dawgs Plus

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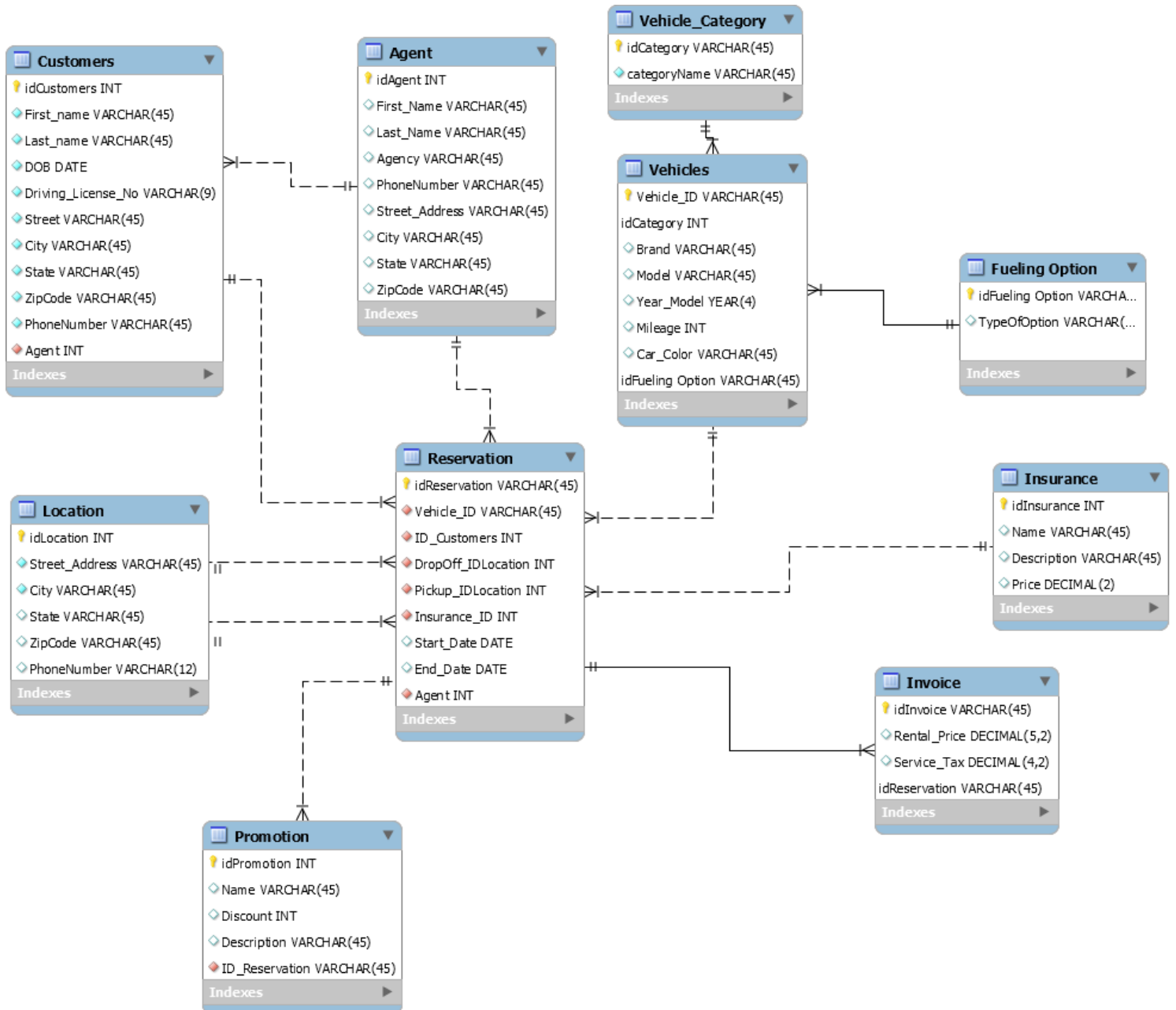
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II. Description of Problem and Data Model

A local Athens car rental company would like the Data Dawgs Plus team to build them a data model that tracks information about their vehicle rental service. The rental company is a startup in which customers use an app to request a vehicle for temporary use. After picking the vehicle up from a location and usage, the customer can then drop the car off at one of many authorized locations. The rental company would like to track information on the vehicle reservations and the customers who utilize the service. They would like information on the vehicle locations (pick up and drop off), fueling options, insurance, duration of the rental (request and return dates), and the agent who approved the reservation. Reservations can only have one of each of these factors, but each of these factors and pertain to a variety of reservations. Note: There is no need to track isolated information on the date.

In terms of the users making the reservations, the rental company would like to track the customers' first and last names, residential address, email, and phone number. Additionally, the company must be aware of the customers' date of birth and license number. It is the responsibility of the agents to authenticate this customer information. An agent can be assigned to multiple customers, but a customer can only have one assigned agent. Because the startup is still growing, the agents are outsourced and work remotely. Along with their names, the company must have the agents' agency name, address, and phone number. After approval, the reservation will produce an electronic invoice containing the rental price plus services taxes and fees. Information on the vehicles is crucial, as it is the foundation of the service. The company would like to track the vehicle make, model, year, mileage, and color. They would also like to track the type of vehicle (ie. sedan, SUV, coupe, etc.). Additionally, the type of fuel for the vehicle is necessary to be known.

In order to encourage more users to try the app, the rental company uses monthly promotions as a marketing tactic. The company would like to track the name of the promotion, the discount amount, and a brief description. A reservation price can be lowered by multiple promotions.

III. Data Model

Customers
- idCustomers INT
- First_name VARCHAR(45)
- Last_name VARCHAR(45)
- DOB DATE
- Driving_License_No VARCHAR(9)
- Street VARCHAR(45)
- City VARCHAR(45)
- State VARCHAR(45)
- ZipCode VARCHAR(45)
- PhoneNumber VARCHAR(45)
- Agent INT
- Indexes

Agent
- idAgent INT
- First_Name VARCHAR(45)
- Last_Name VARCHAR(45)
- Agency VARCHAR(45)
- PhoneNumber VARCHAR(45)
- Street_Address VARCHAR(45)
- City VARCHAR(45)
- State VARCHAR(45)
- ZipCode VARCHAR(45)
- Indexes

Vehicle_Category
- idCategory VARCHAR(45)
- categoryName VARCHAR(45)
- Indexes

Vehicles
- Vehicle_ID VARCHAR(45)
- idCategory INT
- Brand VARCHAR(45)
- Model VARCHAR(45)
- Year_Model YEAR(4)
- Mileage INT
- Car_Color VARCHAR(45)
- idFueling Option VARCHAR(45)
- Indexes

Fueling Option
- idFueling Option VARCHA...
- TypeOfOption VARCHAR(...
- Indexes

Location
- idLocation INT
- Street_Address VARCHAR(45)
- City VARCHAR(45)
- State VARCHAR(45)
- ZipCode VARCHAR(45)
- PhoneNumber VARCHAR(12)
- Indexes

Reservation
- idReservation VARCHAR(45)
- Vehicle_ID VARCHAR(45)
- ID_Customers INT
- DropOff_IDLocation INT
- Pickup_IDLocation INT
- Insurance_ID INT
- Start_Date DATE
- End_Date DATE
- Agent INT
- Indexes

Insurance
- idInsurance INT
- Name VARCHAR(45)
- Description VARCHAR(45)
- Price DECIMAL(2)
- Indexes

Invoice
- idInvoice VARCHAR(45)
- Rental_Price DECIMAL(5,2)
- Service_Tax DECIMAL(4,2)
- idReservation VARCHAR(45)
- Indexes

Promotion
- idPromotion INT
- Name VARCHAR(45)
- Discount INT
- Description VARCHAR(45)
- ID_Reservation VARCHAR(45)
- Indexes

IV. Data Dictionary

Table: Agent

Column Name	Description	Data Type	Size	Format	Key?
idAgent	Unique number assigned to an agent	Integer			PK
First_Name	First name of the agent	Varchar	45		
Last_Name	Last name of the agent	Varchar	45		
Agency	The name of the agency the agent belongs to	Varchar	45		
PhoneNumber	The phone number of the agent	Varchar	45	999-999-9999	
Street_Address	The number and name of the street where the agent is located	Varchar	45		
City	The city where the agent is located	Varchar	45		
State	The state where the agent is located	Varchar	45		

ZipCode	The zip code of where the agent is located	Varchar	45	99999	

Table: Customers

Column Name	Description	Data Type	Size	Format	Key?
idCustomers	Unique number assigned to a customer	Integer			PK
First_name	First name of the customer	Varchar	45		
Last_name	Last name of the customer	Varchar	45		
DOB	The birthday of the customer	Date		YYYY-MM-DD	
Driving_License_No	The driving license number belonging to the customer	Varchar	45	999999999	
Street	The number and name of the street where the customer is located	Varchar	45		
City	The city where the customer is located	Varchar	45		
State	The state where the	Varchar	45		

	customer is located				
ZipCode	The zip code of where the customer is located	Varchar	45	99999	
PhoneNumber	The phone number belonging to the customer	Varchar	45	999-999-9999	
Agent_Number	The id of the agent working with the customer	Integer			FK

Table: Fueling Option

Column Name	Description	Data Type	Size	Format	Key?
idFuelingOption	Id of the fueling option	Varchar	45		PK
TypeOfOption	Different types of fuel	Varchar	45		

Table: Insurance

Column Name	Description	Data Type	Size	Format	Key?
idInsurance	Unique number assigned to an insurance company	Integer			PK
Name	The name of the insurance company	Varchar	45		
Description	The description of the insurance company (describes what	Varchar	45		

Column Name	Description	Data Type	Size	Format	Key?
	coverage they offer)				
Price	The price of having the insurance company	Decimal	2	$99.99	

Table: Invoice

Column Name	Description	Data Type	Size	Format	Key?
idInvoice	Unique number assigned to an invoice	Varchar	45		PK
Rental_Price	The rental price that was paid to rent the vehicle	Decimal	2	$99.99	
Service Tax	The service tax paid for the rental	Decimal	2	$99.99	
idReservation	The unique number of the reservation on the invoice	Varchar	45		FK

Table: Location

Column Name	Description	Data Type	Size	Format	Key?
idLocation	Unique number assigned to the location where you drop off/pick up the rental car	Integer			PK
Street_Address	The number and street of where the vehicle will be dropped off and picked up	Varchar	45		
City	The city where the vehicle will	Varchar	45		

Column Name	Description	Data Type	Size	Format	Key?
	be dropped off and picked up				
State	The state where the vehicle will be dropped off and picked up	Varchar	45		
ZipCode	The zip code of the location where the vehicle will be dropped off/picked up	Varchar	45		
PhoneNumber	The phone number of the location where the vehicle will be dropped off/picked up	Varchar	12	999-999-9999	

Table: Promotions

Column Name	Description	Data Type	Size	Format	Key?
idPromotion	Unique number assigned to a promotion	Integer			PK
Name	The name of the promotion	Varchar	45		
Discount	The discount offered in the promotion	Integer		99	
Description	The description of the promotion	Varchar	45		
idReservation	Unique ID of the reservation where the discount was applied	Varchar	45		

Table: Reservation

Column Name	Description	Data Type	Size	Format	Key?
idReservation	Unique number assigned to a reservation	Varchar	45		PK
Vehicle_ID	Unique id assigned to the vehicle on the reservation	Varchar	45		FK
ID_Customers	Unique number assigned to the customer on the reservation	Integer			FK
DropOff_IDLocation	The unique number of the drop off location for the vehicle	Integer			FK
Pickup_IDLocation	The unique number of the pick up location for the vehicle	Integer			FK
Insurance_ID	The unique number assigned to the insurance company on the reservation	Integer			FK
Start_Date	The start date of the reservation	Date		YYYY-MM-DD	
End_Date	The end date of the reservation	Date		YYYY-MM-DD	
Agent	Unique number assigned to the agent on the reservation	Integer			FK

Table: Vehicle_Category

Column Name	Description	Data Type	Size	Format	Key?
idCategory	The unique number assigned to a vehicle category	Varchar	45		PK
categoryName	The name of the vehicle category	Varchar	45		

Table: Vehicles

Column Name	Description	Data Type	Size	Format	Key?
Vehicle_ID	The unique number assigned to a vehicle	Varchar	45		PK
idCategory	The unique number assigned to the vehicle category the vehicle belongs to	Integer			FK
Brand	The brand of the vehicle	Varchar	45		
Model	The model of the vehicle	Varchar	45		
Year_Model	The year of the model of the vehicle	Year	4	YYYY	
Mileage	The mileage of the vehicle	Integer			

| Car_Color | The color of the vehicle | Varchar | 45 | | |
| idFuelingOption | The unique number assigned to the type of fuel the vehicle uses | Varchar | 45 | | FK |

V. Queries

```sql
SELECT Customers.First_name,Customers.Last_name
FROM Customers
JOIN Agent ON Customers.Agent_Number = Agent.idAgent
WHERE Agent.Agency IN ('Srini''s Industry');
```

1.

    a. Find the Customer first and last name whose agent works at Srini's Industry

        i. Agents within Srini Industry can organize their work schedules accordingly if they know which agent is working with a specific customer.

First_name	Last_name
Angelo	Besnardeau
Gertrude	Goulter
Louise	Carlile
Betty	Pomery
Almeta	Olivera
Tabatha	Martinat
Ardenia	Rainville
Tabitha	Risdale
Sutherland	Folger
Lancelot	Nayshe
Jorry	Downs
Gerome	McEwen
Darnell	De Filippo

        ii.

2.
```sql
SELECT Street_Address, City, State
FROM Location
LEFT JOIN Reservation ON Reservation.DropOff_IDLocation = Location.idLocation
WHERE NOT EXISTS ( SELECT * FROM Reservation WHERE Reservation.DropOff_IDLocation = Location.idLocation)
UNION
SELECT Street_Address, City, State
FROM Location
RIGHT JOIN Reservation ON Reservation.DropOff_IDLocation = Location.idLocation
WHERE NOT EXISTS ( SELECT * FROM Reservation WHERE Reservation.DropOff_IDLocation = Location.idLocation);
```

      a. Find the Address, City, and State of Locations that don't have a reservation

          i.   These locations can help the car rental company sort out places that don't have a pickup or drop off location, so when new customers need a pickup, dropoff location, these locations can fill the vacancy.

Street_Address	City	State
941 Pond Alley	Atlanta	GA
7806 Westridge Parkway	Atlanta	GA
410 Armistice Hill	Atlanta	GA
12099 Hooker Plaza	Atlanta	GA
06 Luster Street	Atlanta	GA
4 Doe Crossing Hill	Atlanta	GA
5003 Schurz Way	Marietta	GA

          ii.

3.
```sql
SELECT categoryName
FROM Vehicles
JOIN Vehicle_Category ON Vehicle_Category.idCategory = Vehicles.idCategory
WHERE Car_Color = 'Maroon'
GROUP BY categoryName;
```

      a. Find the names of different categories of Vehicles that are the color 'Maroon'

          i. If a customer's favorite color is Maroon, they can find the type of vehicles with that color.

categoryName
Wagon
Hybrid
Hatchback
MiniVan
SUV

ii.

4.

```
SELECT First_Name,Last_Name,Rental_Price
FROM Agent
JOIN Reservation ON Agent.idAgent = Reservation.Agent
JOIN Invoice ON Invoice.idReservation = Reservation.idReservation
WHERE Rental_Price > (SELECT AVG(Rental_Price) FROM Invoice)
ORDER BY Rental_Price DESC;
```

   a. Report the Name and Rental Price of Agents that have an invoice greater than the average rental price of invoices, sorted by rental prices

      i. The company can find out which agents are dealing with a customer that have a high-priced invoice which will generate high profit

First_Name	Last_Name	Rental_Price
Cheryl	Maafoh	103.48
Mohazabin	Proba	99.05
Overton	Reed	97.59
Joo	Young Kang	95.03
Sallie	May	93.29

ii.

5.
```
SELECT Agent.First_Name,Agent.Last_Name,Agency,Insurance.Name,COUNT(Customers.idCustomers)
FROM Agent
JOIN Customers ON Agent.idAgent = Customers.Agent_Number
JOIN Reservation ON Reservation.Agent = Agent.idAgent
JOIN Insurance ON Insurance.idInsurance = Reservation.Insurance_ID
WHERE Insurance.Name = (SELECT Insurance.Name FROM Insurance WHERE Insurance.Name = 'Geico')
GROUP BY Agent.First_Name,Agent.Last_Name,Agency,Agent.PhoneNumber,Insurance.Name
HAVING PhoneNumber REGEXP '706';
```

a. Report the Name, Agency, and the number of Customers that an Agent has that deal with a 'Geico' Insurance Account, with the exception that their phone number has a 706 area code

    i. If a customer is local around a place with a 706 area code and prefer Geico insurance, they can find the agent to call to set up the car reservation.

ii.

First_Name	Last_Name	Agency	Name	COUNT(Customers.idCustomers)
Joo	Young Kang	Srini's Industry	Geico	2

6.
```
SELECT Promotion.Name, Vehicles.Brand,Vehicles.Model,Vehicles.Year_Model
FROM Promotion
JOIN Reservation ON Promotion.ID_Reservation = Reservation.idReservation
JOIN Vehicles ON Reservation.Vehicle_ID = Vehicles.Vehicle_ID
WHERE Promotion.Discount > (SELECT AVG(Discount) FROM Promotion,Reservation
                            WHERE Promotion.ID_Reservation = Reservation.idReservation)
ORDER BY Year_Model DESC;
```

a. Display the Vehicle Brand, model, year it was modeled associated with the name of a promotional deal that is going on with it, as long as the discount is greater than the average of all discounts associated with that promotion

    i. Customers will know which vehicles have the best deals and the promotion associated with it.

ii.

Name	Brand	Model	Year_Model
DealsfromMistic	Nissan	Armada	2013
DisaGoodDeal	Toyota	Celica	2011
JooWooDeal	Lexus	LS	2011

7.
```
SELECT First_name,Last_name,PhoneNumber
FROM Reservation
JOIN Invoice ON Invoice.idReservation = Reservation.idReservation
JOIN Customers ON Customers.idCustomers = Reservation.ID_Customers
WHERE Service_Tax < 2;
```

a. Display the Name and Phone Number of Customers who have to pay a service Tax less than $2 on the rental purchase

i. Agents can anticipate the customers that will give them a low amount of money for service tax

First_name	Last_name	PhoneNumber
Sheila	Handyside	404-910-9834
Olimpia	Rhoades	404-278-7983

ii.

8.
```
SELECT Name, Description, Insurance_ID, Price
FROM Reservation
JOIN Insurance ON Reservation.Insurance_ID = Insurance.idInsurance
JOIN Invoice ON Reservation.idReservation = Invoice.idReservation
GROUP BY Insurance_ID
HAVING Price <=30;
```

a. Find the names, IDs, Price, and coverage descriptions of insurance companies where the price is less than 30

i. Customers can see which insurance plans fall within a $30 budget.

ii.

Name	Description	Insurance_ID	Price
NationWide	Strong in Collision Coverage	1002	25
The General	Lots of Comprehensive Coverage	1009	26
Liberty Mutual	Lots of Comprehensive Coverage	1001	20
StateFarm	Strong in Collision Coverage	1008	28
The Hartford	Includes Liability Coverage	1003	24

9.
```
SELECT idReservation, First_name, Last_name, DOB, Driving_License_No
FROM Reservation
JOIN Customers ON Reservation.ID_Customers = Customers.idCustomers
JOIN Promotion ON Reservation.idReservation = Promotion.ID_Reservation
WHERE Discount = 32;
```

a. Identify the name of the customer who had the "AndyDeal" promotion

i. The company can see which customer took advantage of the AndyDeal to see if its a good promotion and if they should continue to promote it

ii.

idReservation	First_name	Last_name	DOB	Driving_License_No
007	Marci	Brewett	1991-08-12	376363287

10.
```
SELECT COUNT(idAgent) AS '# of Agents', Agency
FROM Agent
GROUP BY Agency
HAVING COUNT(idAgent);
```

a. Display the number of agents in each insurance agency
   i. The company can know how many agents are in each of the agency departments to assess the working resources accordingly

# of Agents	Agency
5	TrumanTime
4	CharleyLand
4	Srini's Industry

ii.

VI. Query Matrix

	Query 1	Query 2	Query 3	Query 4	Query 5	Query 6	Query 7	Query 8	Query 9	Query 10
Multiple Table Join	x	x	x	x	x	x	x	x	x	
SubQuery				x						
Correlated SubQuery		x			x	x				
GROUP BY			x							
GROUP BY with HAVING					x			x		x
ORDER BY				x		x				
IN or NOT IN	x									

A Built-In Function (e.g., AVG) or A Calculated Field				x						x
REGEXP					x					
NOT EXISTS		x								

VII. Name of database on MySQL server: DataDawgsPlus