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Class: Database Development I

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Project: Car Dealership Database Phase 3,

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Regulatory Compliance

As a car dealership, it's very important to follow States rules and follow legal, ethical, and professional standards to provide safe and high-quality service to the customers.
For that, everything related to selling, buying, financing, insuring, and even things like customer communication and the format of emails will be studied by our legal team in order to be compliant with the States laws when it comes to an auto dealership.
For instance, the Office of Foreign Asset Controls (**OFAC**) requires car dealers to check customer names against a database of known dangerous organizations and individuals.

Data Volumes and Usage Analysis

- **Inventory table:** The inventory table is expecting the volume of only 1 data, which will be the total number of cars. The inventory table will be accessed everytime cars are looked up. The table is expected to have only one row and is expected to be accessed

every day; showing off as many as 1000 cars in total and will be accessed on a daily basis of 5000 times per day.

- **Car:** The car table is expected to hold data for as many as 1000 cars and will be accessed every time a vehicle is searched for, which is expected to be up to 10,000 times per day.
- **Car Color:** The car color table is expected to hold data for 5 colors. The table will have 5 rows and the table is expected to be accessed up to 10,000.
- **Car Model:** The car model table is expected to hold data for 6 models. The table will have 6 rows and will be accessed up to 10,000 times per day.
- **Order:** The order table is expected to hold data for up to 5000 orders. This table is expected to be accessed up to 100 times per day.
- **Customer:** The customer table is expected to hold data for up to 4000 customers. This table is expected to be accessed up to 100 times per day.
- **Customer Zip Code:** Customer Zip Code table is expected to hold data for 4000 zip codes. This table is expected to be accessed up to 100 times per day.
- **Employee:** The employee table is expected to hold data for up to 30 employees. This is expected to be accessed 30 times per week.
- **E Driver:** The driver table is expected to hold data for 10 employees, and is expected to be accessed up to 20 times per week.
- **E ISA:** The ISA table is expected to hold data for 20 employees. The ISA table is expected to be accessed up to 40 times per week.

Indexes

For our database indexes are very important, they are practical and very easy to use, especially with a database that has a relatively small amount of tables as this Car Dealership Database. For instance, most customers, prior to the process of buying a car, one of the features that they first look for is the price and the year. With the indexes of the database, retrieving that information would be very fast as multiple key retrieval will be applied based on these two important features. Our database will consist of multiple indexes, to make the process less time consuming, based on the customer's needs when it comes to buying a car.

Note: The name of the indexes will be displayed in the fourth phase of the project, when the indexes will be created using the queries in the database. The indexes are created only for the largest tables or if it is completely necessary.

From the customer perspective:

- The most important table to create an index out of is the **CAR** table for obvious reasons. The index of this table will be based on the Price attribute. With this index table, customers will spend less time looking for cars better suited to their budget.
- To optimize the retrieval of data an index will also be created out of the **MODEL** table.

From the DBA perspective:

- Indexes will be created out of the **EMPLOYEE** table, based on the *Last Name* and *First Name* attributes, to retrieve information about certain employees as fast as possible.
- The **CUSTOMER** table will also need indexes, based on the primary key *Customer ID* and the *Last Name* attributes.
- The **ORDER** table will also have indexes, one based on its primary key *Order ID* and other based on the *Order Date* attribute. For the DBA and the personnel allowed to run queries in the database, it is important to locate the order, the date of the order, and the customer who places it.

File Organization

As for the type of file organization that we'll use to go through our database, we have decided to use the index file organization system. In an indexed file organization, the records are stored either sequentially or nonsequentially, and an index will be created to allow the database to locate individual records after running the queries. In fact, it'll help the employees and the customers to access data very easily as the index table will be showing hints for each car category and ease the search.

MY SQL

Inventory

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Inventory ID	Inventory Identifier	INT	6	No	Primary Key
Inventory_total	Total units of inventory	INT	5	Yes	

Car

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Car ID	Car Identifier	INT	6	No	Primary Key
Drive_train	Car Drivetrain	NCHAR	3	No	
Transmission	Car Transmission	NCHAR	9	No	
Price	Car Price Value	DECIMAL	8	No	
Total_units	Total available unit of a car	INT	3	No	
Status	Availability of a car	NCHAR	12	Yes	

Car Color

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Color ID	Car color Identifier	INT	6	No	Primary Key
Car_ID	Car identifier	INT	6	No	Foreign Key
Color_name	Car color	NVARCHAR	7	No	

Car Model

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Model	Car model	NVARCHAR	10	No	
Car ID	Car identifier	INT	6	No	Primary Key
Engine_size	Car engine size/capacity	NVARCHAR	10 2.5 Liter	No	

Order

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Order ID	Order identifier	INT	6	No	Primary Key
Item	Order item	NVARCHAR	25	No	
order_date	Order placed date	DATE	10	No	
shipped_date	Order shipped date	DATE	10	Yes	
delivery_date	Order delivery date	DATE	10	Yes	
order_total	Order sum in dollars and cents	DECIMAL	10	No	
payment_method	Payment method used to pay order	NCHAR	6	No	

Customer

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Customer Id	Customer identifier	INT	6	No	Primary
First_name	Customer First name	NVARCHAR	20	No	
Last_name	Customer Last name	NVARCHAR	35	No	
House_number	Customer address house number	NVARCHAR	20	No	
Street	Customer address street	NVARCHAR	40	No	
Phone_number	Customer Phone number	INT	12	No	
Email_address	Customer email address	NVARCHAR	30	Yes	
Zip code	Customer address zip code	INT	10	No	Foreign Key

Zip Code

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Zip Code	Address zip code	INT	10	No	Primary key
State	Address state	NVARCHAR	2	No	
City	Address city	NVARCHAR	20	No	
Customer Id	Customer identifier	INT	6	No	Foreign Key

Employee

Attribute	**Description**	**Data Type**	**Data Length**	**Allow Null?**	**Key/Index**
Employee ID	Employee Identifier	INT	6	No	Primary Key
First_name	Employee First name	NVARCHAR	20	No	
Last_name	Employee Last name	NVARCHAR	35	No	
Employee_address	Employee Address	NVARCHAR	60	No	
Title	Employee Title	NVARCHAR	20	No	

E Driver

Attribute	**Description**	**Data Type**	**Data Length**	**Allow Null?**	**Key/Index**
D Employee ID	Employee Identifier	INT	6	No	Primary Key
License_id	Employee Driver License ID	INT	9	No	
Truck_number	Delivery truck number	INT	3	No	
Delivery_number	Order delivery number	INT	5	No	

E ISA

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
I Employee ID	Employee Identifier	INT	6	No	Primary Key
Sales_number	Number assigned for employee sale	INT	4	Yes	
Commission	Commision paid to employee	DECIMAL	5	Yes	

MS SQL SERVER

Inventory

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Inventory ID	Inventory Identifier	INT	6	No	Primary Key
Inventory_total	Total units of inventory	INT	5	Yes	

Car

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Car ID	Car Identifier	INT	6	No	Primary Key
Drive_train	Car Drivetrain	NCHAR	3	No	
Transmission	Car Transmission	NCHAR	5	No	
Price	Car Price Value	DECIMAL	8,2	No	
Total_units	Total available unit of a car	INT	3	No	
Status	Availability of a car	NCHAR	9	Yes	

Car Color

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Color ID	Car color Identifier	INT	6	No	Primary Key
Car_ID	Car identifier	INT	6	No	Foreign Key
Color_name	Car color	NVARCHAR	7	No	

Car Model

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Model	Car model	NVARCHAR	10	No	
Car ID	Car identifier	INT	6	No	Primary Key
Engine_size	Car engine size/capacity	NVARCHAR	10 2.5 Liter	No	

Order

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Order ID	Order identifier	INT	6	No	Primary Key
Item	Order item	NVARCHAR	25	No	
order_date	Order placed date	DATE	10	No	
shipped_date	Order shipped date	DATE	10	Yes	
delivery_date	Order delivery date	DATE	10	Yes	
order_total	Order sum in dollars and cents	DECIMAL	10,2	No	
payment_method	Payment method used to pay order	NCHAR	6	No	

Customer

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Customer Id	Customer identifier	INT	6	No	Primary
First_name	Customer First name	NVARCHAR	20	No	
Last_name	Customer Last name	NVARCHAR	35	No	
House_number	Customer address house number	VARCHAR	20	No	
Street	Customer address street	NVARCHAR	40	No	
Phone_number	Customer Phone number	INT	12	No	
Email_address	Customer email address	NVARCHAR	30	Yes	
Zip code	Customer address zip code	INT	10	No	Foreign Key

Zip Code

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Zip Code	Address zip code	INT	10	No	Primary key
State	Address state	NVARCHAR	2	No	
City	Address city	NVARCHAR	20	No	
Customer Id	Customer identifier	INT	6	No	Foreign Key

Employee

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
Employee ID	Employee Identifier	INT	6	No	Primary Key
First_name	Employee First name	NVARCHAR	20	No	
Last_name	Employee Last name	NVARCHAR	35	No	
Employee_address	Employee Address	NVARCHAR	60	No	
Title	Employee Title	NVARCHAR	20	No	

E Driver

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
D Employee ID	Employee Identifier	INT	6	No	Primary Key
License_id	Employee Driver License ID	INT	9	No	
Truck_number	Delivery truck number	INT	3	No	
Delivery_number	Order delivery number	INT	5	No	

E ISA

Attribute	Description	Data Type	Data Length	Allow Null?	Key/Index
I Employee ID	Employee Identifier	INT	6	No	Primary Key
Sales_number	Number assigned for employee sale	INT	4	Yes	
Commission	Commision paid to employee	DECIMAL	5	Yes	