CpE-341: Database Management Systems I

E-Commerce Database management for Automobiles

AutomobilesDB

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Signature Page

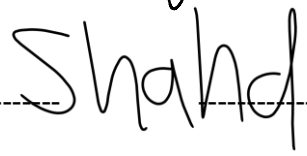
Guidelines

- *Students can decline to sign, or teams can refuse to let a member or members sign.*
- *Students who do not sign receive a grade of zero on the document*.

- ***I declare that I read the new instructions and guidelines of 395 &495 and accept them.***

- I did my share of the work, and I have a general understanding of the contents of the assignment

- I declare that this assignment is my own original work, except where the original source is cited.

Name	Signature
----------Chada----------	
----------Shahd----------	
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Credits

Member	Task
Shahd Al-Anzi	A detailed description of your idea and domain
	A list of features that your system will have
	A detailed system requirement that will cover all system necessities. The requirement should cover specific details of all system features and needs
Chada Serrid	A list of all intended users who will use your system and how each can benefit from your system
	Any limitation or constraint in your proposed design
	An ER diagram that covers your system requirements.

Phase 2:

1. Detailed idea description

This system is designed to manage an online car marketplace where customers can buy or rent vehicles from vendors in an efficient and organized manner. The platform caters to two primary user groups: vendors, who list and sell or rent out their vehicles, and customers, who browse the available cars, complete transactions, and leave reviews based on their experience. The system ensures that all interactions between users are seamlessly recorded, monitored, and managed to maintain a smooth and transparent marketplace.

The system includes a well-defined structure that allows vendors to register and manage their listed vehicles, specifying details such as the **VIN** (Vehicle Identification Number or Chassis Number), make, model, year, price, condition, and location of each car. Customers, on the other hand, can register and interact with the system by purchasing or renting vehicles. Each transaction is systematically recorded through an invoicing and payment module, which tracks payment details, amounts, and methods, ensuring financial accuracy and transparency. Additionally, the system incorporates a review mechanism, allowing customers to leave feedback, ratings, and comments, contributing to a more trustworthy marketplace.

One of the key features of the system is its location management module, which associates vendors and vehicles with specific locations. This is particularly useful for rental transactions, as the system also integrates pickup locations, where customers can retrieve rented vehicles at designated locations with assigned time slots. This feature enhances the efficiency of the rental process and provides a structured way to manage vehicle availability.

To ensure reliability and efficiency, this system will be built using **SQL**, a powerful relational database management system. SQL is chosen for its ability to process complex queries, maintain data consistency, and efficiently handle relationships between entities such as customers, vendors, vehicles, transactions, and locations. By leveraging structured data storage and optimized querying capabilities, the

system can quickly retrieve relevant information, such as filtering available cars by location, managing multiple vendors, tracking financial transactions, and handling user authentication securely.

In summary, this online car marketplace provides a user-friendly, efficient, and reliable platform for vendors to sell or rent out their cars while ensuring customers have a smooth experience in browsing, purchasing, and renting vehicles. The integration of financial tracking, user authentication, location management, and reviews makes this system a comprehensive and well-structured solution for managing car sales and rentals in an organized and scalable manner.

1.1 Requirements Analysis:

For a customer to buy or rent a vehicle through the system, they must provide their personal information, including their first name, last name, phone number, email address, and driving license number. This information is required to complete any transaction, whether purchasing or renting a vehicle.

Customers need an invoice when completing a transaction. An invoice confirms that the customer has successfully bought or rented a vehicle from a vendor. The invoice contains details such as the customer's first and last name, invoice ID, vehicle ID, vendor ID, total amount, payment method, and transaction date.

Each vehicle in the system has specific attributes, including the vehicle ID, make, model, year, price, condition (new or used), type (rental or sale), and location. If a vehicle is available for rent, additional details such as rental price per day and pickup location are recorded.

A vendor is responsible for listing vehicles for sale or rent. To become a vendor, an individual or business must provide their vendor ID, first name, last name (or business name), phone number, and location. Vendors can manage their listed vehicles, update their availability, and track customer transactions.

When a customer rents a vehicle, they must specify the rental duration and pickup location. Each rental transaction is recorded in the system with details such as the rental ID, customer ID, vehicle ID, pickup date, return date, and total rental cost. Customers must return the rented vehicle to the designated pickup location within the agreed-upon timeframe.

Customers can leave reviews after purchasing or renting a vehicle. A review includes the customer ID, vendor ID, rating (out of five), and comments. Reviews help future customers make informed decisions about vendors and their vehicles.

This system ensures a structured and efficient process for vehicle transactions by tracking customer and vendor details, managing sales and rentals, recording financial transactions, and providing a review mechanism to maintain marketplace credibility.

VIN	1HGCM82633A123456
Make/Model	Honda Accord
Year	2020
Price	6500 KD
Category	Family
Location	Salmiya, Kuwait
Rent Price	15 KD/day
Condition	Good
Color	White
Status	Available

Table 1: Example for a Car Database.

1.2 Integrity Constraints:

Entity 1	Name of the Relationship	Entity 2	Cardinality
Vendor	Sells	Car	1:M
Vendor	Rents	Car	1:M
Customer	Purchase_request	Car	M:1
Customer	Rents	Car	M:1
Customer	Returns	Car	1:M
Vendor	Has	Location	1:1
Customer	Has	Location	1:1
Car	Has	Location	1:1
Customer	Leaves	Review	1:M
Vendor	Has	Review	1:M
Customer	Receives	Invoice	1:M
Invoice	Pays	Payments	1:M
Payments	Uses	PaymentMethod	M:1
Invoice	Assigns	Pickup_location	1:1

Table 2: Entity Relationships and Constraints

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2. Entities, ER Diagram and Relational Schema

2.1Entities

Customer

CID	FName	LName	Email	LocationID	Phone_number	Hashed_password	Date_registered

Vendor

VID	Vendor_name	Email	LocationID	Phone_number	Hashed_password	Date_registered	Total_sales

Car

CarID	VIN	VID	Make	Model	Year	Price	Rent_price	Condition	Color	Status	Location	Category_name

Invoice

Invoice_ID	Total_amount	Invoice_date	PL_ID	Payment_ID	CID	VID

Payment_method

PaymentID	Name	Discription	Total_amount	PaymentDate	PaymentDate	Payment_status

Payments

Date	Amount	Invoice_ID

Location

LocationID	Street	City	Country	Block

Pickup_Location

PL_ID	Location_name	Address	Ttime_slots

Review

ReviewID	CID	CarID	VID	Rating	Comment	Review_Date

Figure 1: Entities Schema

2.2 Relational Schema

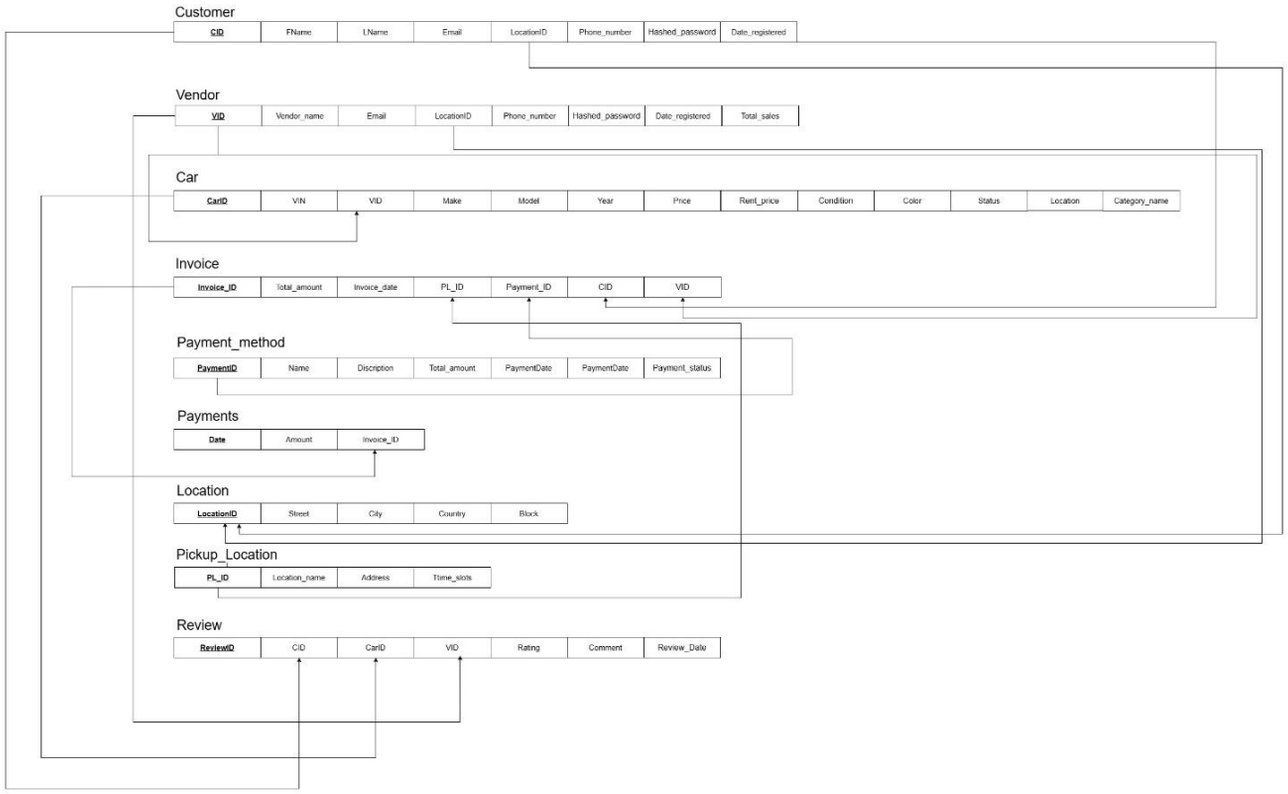

Figure 2: Relational Schema

2.4 ER Diagram

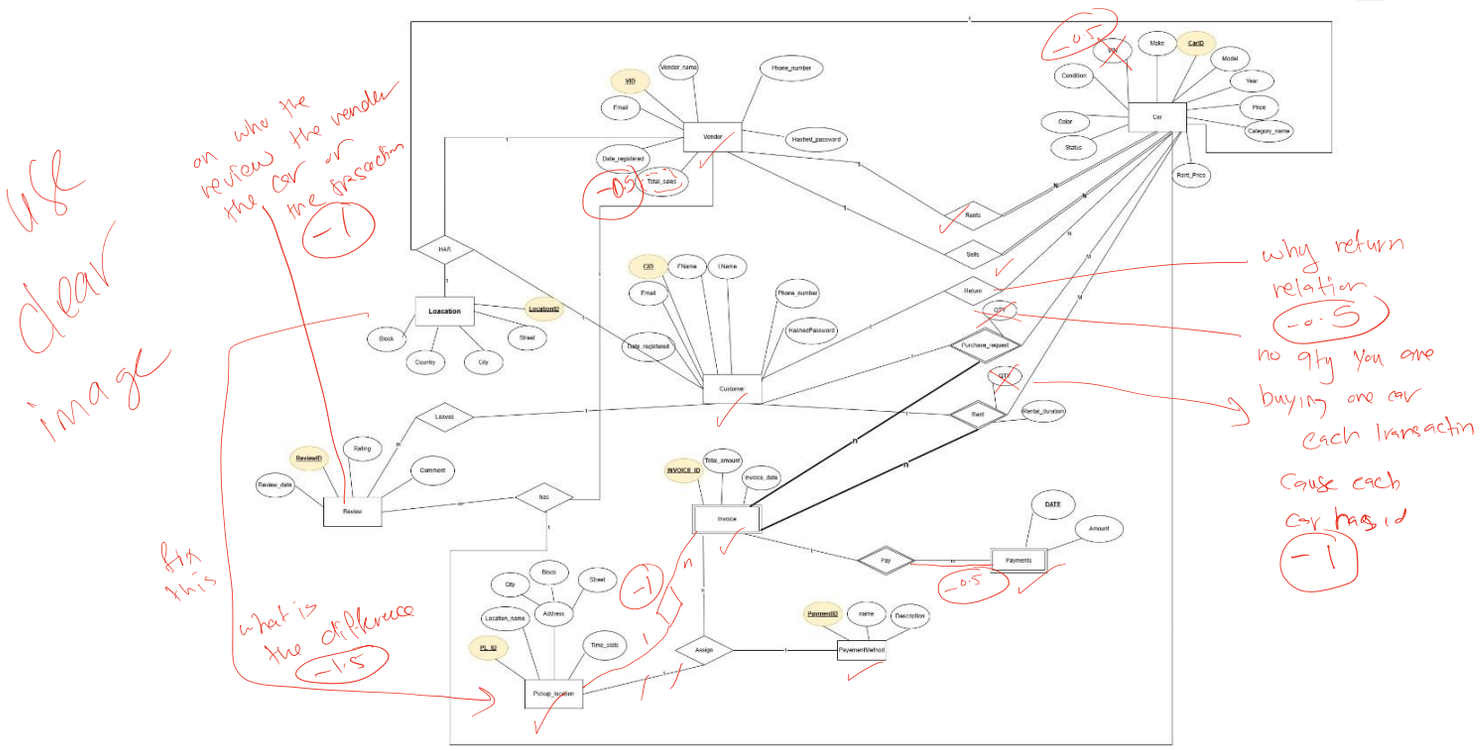

Figure 3: ER Diagram

Appendix A: Meeting Minutes

Meeting1	**24/5/2025 at 1-2pm**
Meeting 2	**10/3/2025 at 10-11pm**
Meeting 3	**21/3/2025 at 10-11pm**
Meeting4	**24/3/2025 at 12:30-2 pm**