

CSC 380 Project



Car Shop

Section 41209

Team 2

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1. Overview

A car dealership company which is authorized to make contracts with agencies or one of their sales subsidiaries. It offers their customers value-adding services and helps potential consumers find the right car by matching their wants, needs, and budget. It also employs people such as car salespeople and car mechanics.

2. Requirement Specification

Requirements:

- The dealership is organized into Departments, each Department is described by a unique number, name, phone number, and each department is managed by exactly one employee called the sub– manager and each submanager can manage exactly one department . Each department needs at least 10 employees.
- The car dealership has 500 employees where each employee is described by a unique ID, name, phone number, hire date, salary, address (city, street, zip code), birth date, and gender. Each employee works for exactly one department. And each employee may have one supervisor. An employee may work in one warehouse. A warehouse may have many employees. And An employee may serve multiple customers a day.
- Each employee may have several dependents. For each dependent, the Database keeps a record of name, gender, and birthdate.
- Each Car in the car dealership has a unique id and a car plate (letters , numbers), status whether it's available or sold, brand, model that consists of (name, numbers), color, and cost. Each car is provided by an agency and must be stored in a warehouse.
- Spare parts have a name, unique number, price, brand, and Quantity. And are stored in a warehouse.
- The customers are described by a name, a unique id, phone number, address (city , street, zip code), salary. Each customer is served by one or more employees. The customer can buy at least one car and 6 cars at most. The customer must have one insurance or more during the payment.

-Each branch has a unique id, name, location, and contains at least 4 departments which are: The sales and marketing department, management and administration department, customer service department, and a parts and maintenance department.

The branches are supplied by one or more agencies.

-The warehouse is described by its location. It needs a minimum of 2 employees and up to 5 employees, it contains up to 200 cars and provides many branches with cars or spare parts

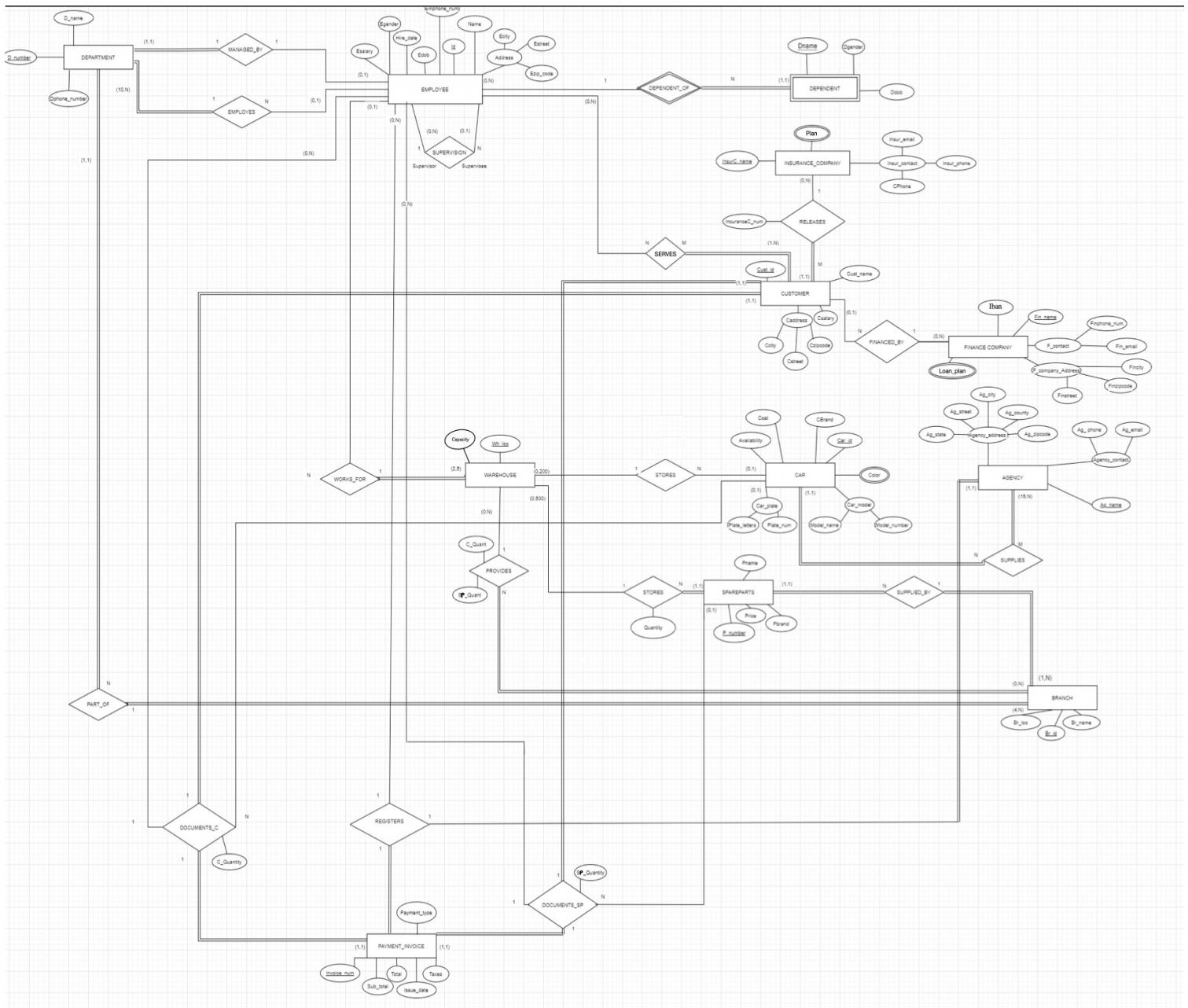
-Every agency has a unique name and its own address (country, city, state, street, zip code) and contact (email, phone number). The agency must provide at least 15 cars. And supplies at least 100 spare parts that are documented in a payment invoice.

-There is an insurance company that must provide insurance for customers, that has a unique name, contact details (phone number, email), plans, and a unique insurance number that is tied for every customer's payment.

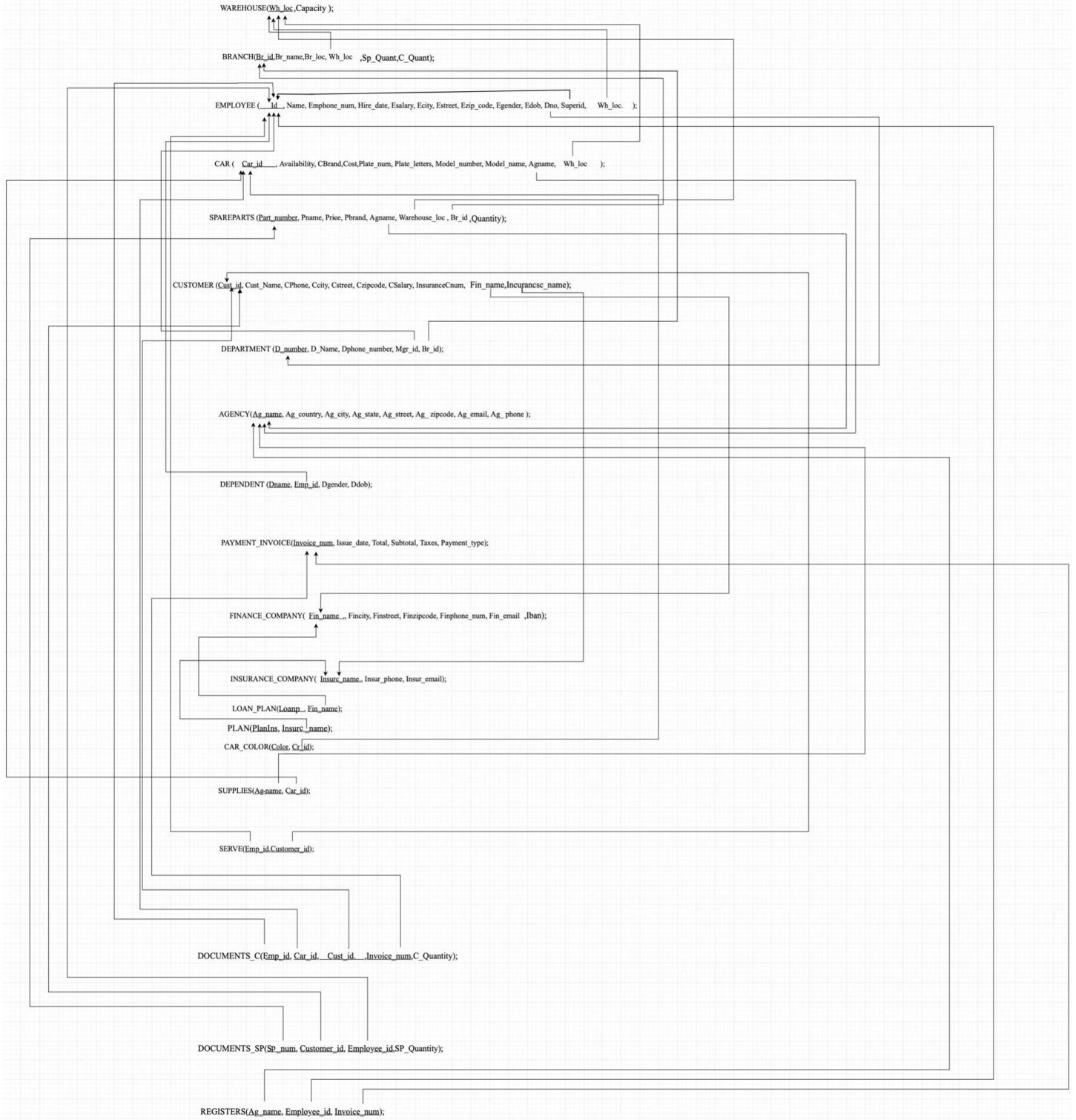
-A finance company which may lend a customer has its own name that distinguishes it from other finance companies, address (city , street, zip code), contact information (phone number, email), loan plans.

-A payment invoice has a unique number, issue date, total, subtotal, taxes, payment type. An invoice is issued by an employee for each customer's payment. The invoice includes the car that has been sold. Or register the part that has been sold and the quantity of the sold cars or spare parts must be included in the payment invoice.

3. Entity Relationship Diagram



4. Relational Schema



5. System Users

User Groups in our DB : (1-General Manager , 2-Warehouse Manager, 3- Salesperson Employee , 4-Maintenance Employee , 5-Employee “others”, 6-Supplier , 7-Customer)

1- User groups description / view / possible operations :

- General Manager :

Description :

The general manager can monitor the whole database system. They can create and update contracts with agencies. They can personally hire and fire employees. They can also promote employees and allow them access to the database. They can also review the payment invoices. They can also insert and modify branches and warehouses.

Their view :

| Customer_ID | Customer_Name | Customer_Phone | Customer_City |
|--------------------|--------------------|-------------------|----------------------|
| Customer_Street | Customer_Zipcode | Insurance_Number | Insurance_Name |
| Insurance_Phone | Insurance_Email | Insurance_Plan | Finance_Name |
| Finance_City | Finance_Street | Finance_Zipcode | Finance_Phone |
| Finance_Email | IBAN | PInvoice_Number | Issue_Date |
| Car_Quantity | AvailabilityOfCar | Car_ID | Car_cost |
| Plat_number | Plat_letter | Model_number | Model_name |
| SupTotal | Taxes | Total | Pament_Type |
| Spart_Quantity | Agency_Name | SPart_Name | SPart_Number |
| SPart_price | SPart_Brand | Car_Brand | Employee_name |
| Employee_ID | Employee_Phone | Employee_HireDate | Employee_salary |
| Employee_city | Employee_street | Employee_zipcode | Employee_Gender |
| Employee_Dno | Employee_DOB | Department_name | Department_phone |
| Department_MID | Dependent_name | Dependent_gender | Dependent_DOB |
| Warehouse_location | Warehouse_Capacity | Branch_ID | Branch_name |
| Branch_location | Agency_country | Agency_city | Agency_state |
| Agency_street | Agency_zipcode | Agency_email | Agency_phone |
| LoanPlan | Department_Number | Customer_salary | Maintenance_end_date |
| SuperEmployee_ID | Insurance_plans | Car_color | |

Possible Operations :

Insert operations :

```
INSERT INTO EMPLOYEE
```

```
VALUES ('1111219777' , NULL , 'Sara' , '0554634221' ,  
'2019-12-10' , '7000' , 'Riyadh' , 'Street 367' , '13214' ,  
'Female' , '1998-10-3' , NULL , NULL );
```

```
INSERT INTO EMPLOYEE
```

```
VALUES ('2001110457' , '1111219777' , 'Nourah' , '0555768494' ,  
'2020-11-10' , '5000' , 'Riyadh' , 'Street 443' , '14059' ,  
'Female' , '2000-11-3' , NULL , NULL );
```

| | Id | Superid | Name | Emphone_num | Hire_date | Esalary | Ecity | Estreet | Ezip_code | Egender | Edob | Dno | WLoc |
|---|------------|------------|--------|-------------|------------|---------|--------|------------|-----------|---------|------------|------|------|
| ▶ | 1111219777 | NULL | Sara | 554634221 | 2019-12-10 | 7000.00 | Riyadh | Street 367 | 13214 | Female | 1998-10-03 | NULL | NULL |
| ◀ | 2001110457 | 1111219777 | Nourah | 555768494 | 2020-11-10 | 5000.00 | Riyadh | Street 443 | 14059 | Female | 2000-11-03 | NULL | NULL |
| | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |
| | | | | | | | | | | | | | |

```
INSERT INTO WAREHOUSE
```

```
VALUES ( 'ALKHARJ-11524' , 500 );
```

| | Wh_loc | Capacity |
|---|---------------|----------|
| ▶ | ALKHARJ-11524 | 500 |
| ◀ | NULL | NULL |
| | | |

```
INSERT INTO BRANCH
```

```
VALUES ('1' , 'AlHamra' , 'Riyadh' , 'ALKHARJ-11524' , 60 , 30);
```

| | Br_id | Br_name | Br_loc | Wh_loc | Sp_Quant | C_Quant |
|---|-------|---------|--------|---------------|----------|---------|
| ▶ | 1 | AlHamra | Riyadh | ALKHARJ-11524 | 60 | 30 |
| ◀ | NULL | NULL | NULL | NULL | NULL | NULL |
| | | | | | | |

```
INSERT INTO DEPARTMENT  
VALUES ('1', 'sales and  
marketing', '0505184935', '1111219777', '2'),  
('2', 'parts and maintenance ', '0556732487', '1111219777', '3'),  
('3', ' management and  
administration', '0555674289', '2001110457', '1'),  
('4', ' customer service', '0531256789', '2001110457', '2');
```

| D_number | D_Name | Dphone_number | MgrId | Br_id |
|----------|-------------------------------|---------------|------------|-------|
| 1 | sales and marketing | 505184935 | 1111219777 | 1 |
| 2 | parts and maintenance | 556732487 | 1111219777 | 1 |
| 3 | management and administration | 555674289 | 2001110457 | 1 |
| 4 | customer service | 531256789 | 2001110457 | 1 |
| NULL | NULL | NULL | NULL | NULL |

```
INSERT INTO INSURANCE_COMPANY  
VALUES ('GONSURE', '800124401' , 'Info@gonsure.com'),  
('Tawuniya' , '920019990' , 'info@tawuniya.com.sa') ;
```

```
SELECT * from INSURANCE COMPANY;
```

| Inu_name | Inu_phone | Inu_email |
|---------------------|------------------------|--|
| GONSURE Tawuniya | 800124401 920019990 | Info@gonsure.com info@tawuniya.com.sa |
| HULL | HULL | HULL |

```
INSERT INTO FINANCE_COMPANY  
VALUES('alinma bank','920028000','www.alinma.com','Riyadh','Aben  
Alnafees','9033','38946504305203450265');
```

| Fin_name | Fin_phoneNumber | Fin_email | Fincity | Finstreet | Finzipcode | IBAN |
|---------------|-----------------|----------------|---------|---------------|------------|----------------------|
| ► alinma bank | 920028000 | www.alinma.com | Riyadh | Aben Alnafees | 9033 | 38946504305203450265 |

Delete operations :

```
DELETE FROM CUSTOMER
```

```
WHERE Cust_id = '1023242099';
```

| Cust_id | Cust_name | Cphone | Ccity | Cstreet | Czipcode | Csalary | Insurance_num | FinName | InsuranceName |
|--------------|------------|-----------|----------|---------------|----------|----------|---------------|-------------|---------------|
| ► 1112452376 | Abdullah | 534310999 | Jeddah | Abo Baker st | 668757 | 30000.00 | 1034567934 | alinma bank | Tawuniya |
| 1113856493 | Alsulaiman | 534310699 | Alqassim | King fahad st | 45686 | 5000.00 | 1023456767 | alinma bank | Tawuniya |
| NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

Update operations :

```
UPDATE AGENCY
```

```
SET Ag_email='info300@gmail.com'
```

```
WHERE Ag_name='Aljomaih';
```

| Ag_name | Ag_country | Ag_city | Ag_state | Ag_street | Ag_zipcode | Ag_email | Ag_phone |
|------------|--------------|---------|----------|-----------|------------|-------------------|-----------|
| ► Aljomaih | SAUDI ARABIA | RIYADH | AL KHARJ | NULL | 11512 | info300@gmail.com | 575252521 |
| NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

Retrieve from one table operations :

```
SELECT id
```

```
FROM EMPLOYEE
```

```
ORDER BY id ASC;
```

| |
|------------|
| id |
| 1111219777 |
| 2001110457 |

Retrieve from more than two table (JOIN) operations :

```
SELECT COUNT(Cust_id)
```

```
FROM CUSTOMER, INSURANCE_COMPANY
```

```
WHERE InsuranceName=Inu_name;
```

| |
|----------------|
| COUNT(Cust_id) |
| ► 2 |

- Warehouse Manager :

Description :

A warehouse Manager Strategically manages the warehouse in compliance with the car shop's policies, oversees receiving, warehousing, distribution and maintenance operations, they also ensure efficient space utilization of the Warehouse. They Manage stock control and reconcile with database management System. A Warehouse manager Liaises with the agency, branches for the cars and spare parts detailed information and for also transporting them.

Their view :

| | | | |
|----------------------|-------------------|--------------------|--------------------|
| Car_ID | AvailabilityOfCar | Car_Brand | Car_Cost |
| Plate_number | Plate_letter | Car_Modelnumber | SPart_number |
| Spart_name | Spart_price | Spart_Quantity | Car_color |
| WManeger_ID | WManeger_name | Warehouse_location | Warehouse_capacity |
| Agency_name | Agency_country | Agency_city | Agency_state |
| Agency_street | Agency_zipcode | Agency_email | Agency_phone |
| Invoice_number | Issue_Date | SupTotal | Taxes |
| Car_Quantity | Spart_Brand | Branch_ID | Branch_Name |
| Branch_location | WManeger_phone | WManeger_HireDate | WManeger_salary |
| WManeger_city | WManeger_street | WManeger_zipcode | WManeger_Gender |
| WManeger_SuperID | WM_DependentName | WM_DependentGender | WM_DependentDOB |
| Maintenance_end_date | WManeger_Dno | Car_Modelname | |

Possible Operations :

Insert operations :

```
INSERT INTO AGENCY
VALUES ('Aljomaih' , 'SAUDI ARABIA' , 'RIYADH' , 'AL KHARJ' ,
NULL , 11512 , 'info365@gmail.com' , 8007525252 ) ;
```

| | Ag_name | Ag_country | Ag_city | Ag_state | Ag_street | Ag_zipcode | Ag_email | Ag_phone |
|---|----------|--------------|---------|----------|-----------|------------|-------------------|-----------|
| ▶ | Aljomaih | SAUDI ARABIA | RIYADH | AL KHARJ | NULL | 11512 | info365@gmail.com | 575252521 |

```

INSERT INTO SPAREPARTS

VALUES ('1SAVUD35SXAE20398','Battery','2500.00','BMW Accessory
and parts','180','Aljomaih','ALKHARJ-11524','1');

INSERT INTO SPAREPARTS

VALUES('2SAVUD35SXAE20398','BrakePads','1500.00','Brembo','100',
'Aljomaih','ALKHARJ-11524','1');

INSERT INTO SPAREPARTS

VALUES ('3SAVUD35SXAE20398','speed sensor','1900.00','Ford Parts
and Accessory','140','Aljomaih','ALKHARJ-11524','1');

```

| Part_number | Pname | Price | Pbrand | Quantity | Agen_name | W_location | B_id |
|-------------------|--------------|---------|--------------------------|----------|-----------|---------------|------|
| 1SAVUD35SXAE20398 | Battery | 2500.00 | BMW Accessory and parts | 180 | Aljomaih | ALKHARJ-11524 | 1 |
| 2SAVUD35SXAE20398 | Brake Pads | 1500.00 | Brembo | 100 | Aljomaih | ALKHARJ-11524 | 1 |
| 3SAVUD35SXAE20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaih | ALKHARJ-11524 | 1 |
| HULL | HULL | HULL | HULL | HULL | HULL | HULL | HULL |

```

INSERT INTO CAR

VALUES ('1CAVUD35SXAE20398' , 1 , 'TESLA' , 2000000 ,
'1111' , 'AAA' , '2021' , 'TeslaLuxury
Vehicles','ALKHARJ-11524','2025-1-1');


```

```

INSERT INTO CAR_COLOR

VALUES ('Black','1CAVUD35SXAE20398');

INSERT INTO CAR

VALUES ( '2CAVUD35SXAE20398' , 1 , 'BMW' , 350000 ,
'1122' , 'BBB' , '2020' , 'BMW
M3','Aljomaih','ALKHARJ-11524','1-10-2024');


```

```

INSERT INTO CAR_COLOR

VALUES ('RED','2CAVUD35SXAE20398');

```

```
INSERT INTO CAR  
VALUES ('3CAVUD35SXAE20398' , '1' , 'Audi' , '240000' , '2222' ,  
'ABA' , '2021' , 'A5' , 'Aljomaih' , 'ALKHARJ-11524' , NULL );
```

```
INSERT INTO CAR_COLOR  
VALUES ('White','3CVUD35SXAE20398');
```

```
INSERT INTO CAR
VALUES ('4CXBH41JDXC109842' , '1' , 'Cadillac' , '180000' , '1423' ,
'NUD' , '2021' , 'XT5' , 'Aljomaih' , 'ALKHARJ-11524' , NULL );
```

```
INSERT INTO CAR_COLOR  
VALUES ('Black','4CXBH41JDXC109842');
```

| Color | Cr_id | |
|---------|-------------------|--|
| ► Black | 1CAVUD35SXAЕ20398 | |
| RED | 2CAVUD35SXAЕ20398 | |
| White | 3CVUD35SXAЕ20398 | |
| Black | 4CXBH41JDXC109842 | |
| NULL | NULL | |

Delete operations :

DELETE FROM SPAREPARTS

```
WHERE pname= 'Battery' AND part number = '1SAVUD35SXAE20398';
```

Update operations :

UPDATE CAR

SET Cost = 180000

```
WHERE Car_id = '1CAVUD35SXAE20398';
```

Retrieve from one table operations :

```
SELECT Cost
FROM CAR
WHERE CAR_id= '1CAVUD35SXAЕ20398' ;
```

| Cost | |
|-------------|--|
| ► 180000.00 | |

Retrieve from more than two table (JOIN) operations :

```
SELECT *
FROM CAR AS C , SPAREPARTS AS S
WHERE C.Agname = S.Agen_name;
```

| Car_id | Availability | CBrand | Cost | Plate_num | Plate_letters | Model_number | Model_name | Agname | WhLoc | M |
|-------------------|--------------|----------|-----------|-----------|---------------|--------------|----------------------|----------|---------------|---|
| 1CAVUD35SXAЕ20398 | 1 | TESLA | 180000.00 | 1111 | AAA | 2021 | TeslaLuxury Vehicles | Aljomaih | ALKHARJ-11524 | 1 |
| 2CAVUD35SXAЕ20398 | 1 | BMW | 350000.00 | 1122 | BBB | 2020 | BMW M3 | Aljomaih | ALKHARJ-11524 | 1 |
| 3CVUD35SXAЕ20398 | 1 | Audi | 240000.00 | 2222 | ABA | 2021 | A5 | Aljomaih | ALKHARJ-11524 | 1 |
| 4CXBH41JDXC109842 | 1 | Cadillac | 180000.00 | 1423 | NUD | 2021 | XT5 | Aljomaih | ALKHARJ-11524 | 1 |
| 1CAVUD35SXAЕ20398 | 1 | TESLA | 180000.00 | 1111 | AAA | 2021 | TeslaLuxury Vehicles | Aljomaih | ALKHARJ-11524 | 1 |
| 2CAVUD35SXAЕ20398 | 1 | BMW | 350000.00 | 1122 | BBB | 2020 | BMW M3 | Aljomaih | ALKHARJ-11524 | 1 |
| 3CVUD35SXAЕ20398 | 1 | Audi | 240000.00 | 2222 | ABA | 2021 | A5 | Aljomaih | ALKHARJ-11524 | 1 |
| 4CXBH41JDXC109842 | 1 | Cadillac | 180000.00 | 1423 | NUD | 2021 | XT5 | Aljomaih | ALKHARJ-11524 | 1 |

| Maintenance_end_da... | Part_number | Pname | Price | Pbrand | Quantity | Agen_name | W_location | B_id |
|-----------------------|-------------------|--------------|---------|--------------------------|----------|-----------|---------------|------|
| 2025-01-01 | 2SAVUD35SXAЕ20398 | Brake Pads | 1500.00 | Brembo | 100 | Aljomaih | ALKHARJ-11524 | 1 |
| 2024-01-10 | 2SAVUD35SXAЕ20398 | Brake Pads | 1500.00 | Brembo | 100 | Aljomaih | ALKHARJ-11524 | 1 |
| NULL | 2SAVUD35SXAЕ20398 | Brake Pads | 1500.00 | Brembo | 100 | Aljomaih | ALKHARJ-11524 | 1 |
| NULL | 2SAVUD35SXAЕ20398 | Brake Pads | 1500.00 | Brembo | 100 | Aljomaih | ALKHARJ-11524 | 1 |
| 2025-01-01 | 3SAVUD35SXAЕ20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaih | ALKHARJ-11524 | 1 |
| 2024-01-10 | 3SAVUD35SXAЕ20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaih | ALKHARJ-11524 | 1 |
| NULL | 3SAVUD35SXAЕ20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaih | ALKHARJ-11524 | 1 |
| NULL | 3SAVUD35SXAЕ20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaih | ALKHARJ-11524 | 1 |

- Employee (Salesperson) :

Description :

A Salesperson sells cars and value-adding services such as maintenance plans, warranties, etc., directly to customers. They understand the detailed informations and the features of each car and spare part, they also know of the products that are available for purchase and those are not and in which warehouse the products are in, they provide the potential customer with detailed information about their desired cars or spare parts, depending on their needs, their insurance informations and their finance informations. They regulate the whole payment process of the customers including setting their payments invoices.

Their view :

| | | | |
|------------------|--------------------|-----------------------|------------------|
| Customer_ID | Customer_Name | Customer_Phone | Customer_City |
| Customer_Street | Customer_Zipcode | Insurance_Number | Insurance_Name |
| Insurance_Phone | Insurance_Email | Insurance_Plan | Finance_Name |
| Finance_City | Finance_Street | Finance_Zipcode | Finance_Phone |
| Finance_Email | IBAN | PaymentInvoice_Number | Issue_Date |
| Car_Quantity | AvailabilityOfCar | Car_ID | Car_cost |
| Plat_number | Plat_letter | Model_number | Model_name |
| SupTotal | Taxes | Total | Pament_Type |
| Spart_Quantity | Agency_Name | SPart_Name | SPart_Number |
| SPart_price | SPart_Brand | Warehouse_location | SalesMan_name |
| SalesMan_ID | SalesMan_Phone | SalesMan_HireDate | SalesMan_salary |
| SalesMan_city | SalesMan_street | SalesMan_zipcode | SalesMan_Gender |
| SalesMan_Dno | Car_color | Department_name | Department_phone |
| SalesMan_DOB | SalesMan_SuperID | Customer_salary | Car_Brand |
| SM_DependentName | SM_DependentGender | SM_DependentDOB | Branch_Id |
| Branch_location | WManeger_phone | | |

Possible Operations :

Insert operations :

```
INSERT INTO CUSTOMER  
VALUES ('1112452376' , 'Abdullah' , '0530998725' , 'Riyadh' ,  
'Street 369' , '13244' , '20000' , '1034567934' , 'alinma bank'  
'Tawuniya' );
```

```
INSERT INTO CUSTOMER  
VALUES ('1023242099' , 'Alanoud' , '0522359378' , 'Jeddah' ,  
'Street 455' , '12256' , '25000' , '1034684756' , 'alinma bank'  
'Tawuniya' );
```

| Cust_id | Cust_name | Cphone | Ccity | Cstreet | Czipcode | Csalary | Insurance_num | FinName | InsuranceName |
|--------------|-----------|-----------|--------|------------|----------|----------|---------------|-------------|---------------|
| ► 1023242099 | Alanoud | 522359378 | Jeddah | Street 455 | 12256 | 25000.00 | 1034684756 | alimma bank | Tawuniya |
| 1112452376 | Abdullah | 530998725 | Riyadh | Street 369 | 13244 | 20000.00 | 1034567934 | alimma bank | Tawuniya |

```
INSERT INTO PAYMENT_INVOICE  
VALUES ('75983' , '2021-06-07' , '207000' , '180000' , '27000'  
, 'CREDIT CARD' );
```

| Invoice_num | Issue_date | Subtotal | Total | Taxes | Payment_type |
|-------------|------------|----------|--------|-------|--------------|
| ► 75983 | 2021-06-07 | 207000 | 180000 | 27000 | CREDIT CARD |
| HULL | NULL | NULL | NULL | NULL | NULL |

Delete operations :

```
DELETE FROM CAR  
WHERE Car id = '3CAVUD35SXAE20398';
```

Update operations :

```
UPDATE CAR  
SET Availability = 0  
WHERE Car id = '4CXBH41JDXC109842';
```

Retrieve from one table operations :

```
SELECT CAR.Cost  
FROM CAR  
WHERE Car_id = '1CAVUD35SXAЕ20398';
```

| Cost |
|-----------|
| 180000.00 |

Retrieve from more than two table (JOIN) operations :

```
SELECT Car_id  
FROM CAR AS C ,WAREHOUSE AS W  
WHERE C.WhLoc = W.Wh_loc AND Cost > 150000 AND W.Wh_loc =  
'ALKHARJ-11524';
```

| Car_id |
|---------------------|
| ► 1CAVUD35SXAЕ20398 |
| 2CAVUD35SXAЕ20398 |
| 4CXBH41JDXC109842 |

- Employee (maintenance employee) :

Description :

A Maintenance Worker fixes and maintains mechanical equipment of cars and spare parts, they ensure that each car and spare part works and functions well, they know the detailed information of each product in the carshop and their quantities. They Initiate requisition for materials and equipment; authorize purchases of products; maintain enough inventory of parts, equipment and supplies used in repairing and servicing cars and spare parts.

Their view :

| | | | |
|----------------------|------------------------|--------------------|--------------------|
| Car_ID | Car_Modelnumber | Car_Brand | Spart_Brand |
| Maintenance_end_date | SPart_number | Spart_name | Spart_Quantity |
| Car_Quantity | MEmployee_ID | MEmployee_name | Warehouse_location |
| Issue_Date | MEmployee_phone | MEmployee_HireDate | MEmployee_salary |
| MEmployee_city | MEmployee_street | Car_color | MEmployee_Gender |
| MEmployee_SuperID | ME_DependentName | ME_DependentGender | ME_DependentDOB |
| MEmployee_Dno | Car_Modelname | Plate_letters | Plate_number |
| WManeger_phone | //Maintenance_end_date | | |

Possible Operations :

Delete operations :

DELETE FROM SPAREPARTS

```
WHERE pname='Brake Pads' AND pBrand='Brembo' AND  
Part number='2SAVUD35SXAE20398';
```

Update operations :

UPDATE CAR

```
SET Maintenance end date = CURRENT_TIMESTAMP
```

```
WHERE Car_id = '4CXBH41JDXC109842';
```

| Car_id | Availability | CBrand | Cost | Plate_num | Plate_letters | Model_number | Model_name | Aname | WhLoc | Maintenance_end_da... |
|-------------------|--------------|----------|-----------|-----------|---------------|--------------|----------------------|----------|---------------|-----------------------|
| 1CAVUD35SXAЕ20398 | 1 | TESLA | 180000.00 | 1111 | AAA | 2021 | TeslaLuxury Vehicles | Aljomaіh | ALKHARJ-11524 | 2025-01-01 |
| 2CAVUD35SXAЕ20398 | 1 | BMW | 350000.00 | 1122 | BBB | 2020 | BMW M3 | Aljomaіh | ALKHARJ-11524 | 2024-01-10 |
| 4CXBH41JDXC109842 | 0 | Cadillac | 180000.00 | 1423 | NUD | 2021 | XT5 | Aljomaіh | ALKHARJ-11524 | 2021-11-30 |

Retrieve from one table operations :

```
SELECT COUNT(Part_number)
FROM SPAREPARTS
WHERE pname='speed sensor' AND pBrand='Ford Parts and Accessory';
```

Current DB :

| Part_number | Pname | Price | Pbrand | Quantity | Agen_name | W_location | B_id |
|---------------------|--------------|---------|--------------------------|----------|-----------|---------------|------|
| ▶ 3SAVUD35SXAE20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 | Aljomaiah | ALKHARJ-11524 | 1 |
| ▶ NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

COUNT(Part_number)

▶ 1

Retrieve from more than two table (JOIN) operations :

```
SELECT *
FROM WAREHOUSE, CAR, SPAREPARTS
WHERE Wh_loc=W_location AND Wh_loc=Whloc;
```

| Wh_loc | Capacity | Car_id | Availability | CBrand | Cost | Plate_num | Plate_letters | Model_number | Model_name | Agenname | WhLoc | Maintenance_end_da... | Part_number | Pname | P |
|-----------------|----------|-------------------|--------------|----------|-----------|-----------|---------------|--------------|----------------------|-----------|---------------|-----------------------|-------------------|--------------|---|
| ▶ ALKHARJ-11524 | 500 | 1CAVUD35SXAE20398 | 1 | TESLA | 180000.00 | 1111 | AAA | 2021 | TeslaLuxury Vehicles | Aljomaiah | ALKHARJ-11524 | 2025-01-01 | 3SAVUD35SXAE20398 | speed sensor | 1 |
| ▶ ALKHARJ-11524 | 500 | 2CAVUD35SXAE20398 | 1 | BMW | 350000.00 | 1122 | BBB | 2020 | BMW M3 | Aljomaiah | ALKHARJ-11524 | 2024-01-10 | 3SAVUD35SXAE20398 | speed sensor | 1 |
| ▶ ALKHARJ-11524 | 500 | 4CXBH41JDXC109842 | 0 | Cadillac | 180000.00 | 1423 | NUD | 2021 | XT5 | Aljomaiah | ALKHARJ-11524 | 2021-11-30 | 3SAVUD35SXAE20398 | speed sensor | 1 |

| Price | Pbrand | Quantity | Agen_name | W_location | B_id |
|-----------|--------------------------|----------|-----------|---------------|------|
| ▶ 1900.00 | Ford Parts and Accessory | 140 | Aljomaiah | ALKHARJ-11524 | 1 |
| ▶ 1900.00 | Ford Parts and Accessory | 140 | Aljomaiah | ALKHARJ-11524 | 1 |
| ▶ 1900.00 | Ford Parts and Accessory | 140 | Aljomaiah | ALKHARJ-11524 | 1 |

Employee (IT, customer service,advertisement, etc..) :

Description :

Employees view displays their own information as well as their dependents' information if they have any. Additionally, they also can update and change some of their information such as their names, addresses if they move to a new one, or their contacts information.

Their view :

| | | | |
|---------------|-------------------|---------------------|------------------|
| Employee_ID | Employee_Phone | Employee_HireDate | Employee_salary |
| Employee_city | Employee_street | Employee_zipcode | Employee_Gender |
| Employee_Dno | Employee_SuperID | Department_name | Department_phone |
| Employee_DOB | Emp_DependentName | Emp_DependentGender | Emp_DependentDOB |
| Branch_name | Branch_location | Dependent_Name | D_manager_id |
| Branch_id | | | |

Possible Operations :

Insert operations :

```
INSERT INTO DEPENDENT
VALUES ('Layan Khalid' , '1111219777' , 'Female' , '2000-9-1' ),
('Abdullah Khalid' , '1111219777' , 'Male' , '2003-12-11' );
```

| | Dname | Emp_id | Dgender | Ddob |
|---|-----------------|------------|---------|------------|
| ▶ | Abdullah Khalid | 1111219777 | Male | 2003-12-11 |
| ◀ | Layan Khalid | 1111219777 | Female | 2000-09-01 |
| | NULL | NULL | NULL | NULL |

Delete operations :

```
DELETE FROM DEPENDENT
WHERE Dname='Abdullah Khalid';
```

| | Dname | Emp_id | Dgender | Ddob |
|---|--------------|------------|---------|------------|
| ▶ | Layan Khalid | 1111219777 | Female | 2000-09-01 |
| ◀ | NULL | NULL | NULL | NULL |

Update operations :

```
UPDATE EMPLOYEE
SET Emphone_num='0545758391'
WHERE Id='222222077';
```

| Id | Superid | Name | Emphone_num | Hire_date | Esalary | Ecity | Estreet | Ezip_code | Egender | Edob | Dno | WLoc |
|--------------|------------|--------|-------------|------------|---------|--------|------------|-----------|---------|------------|------|------|
| ► 1111219777 | NULL | Sara | 554634221 | 2019-12-10 | 7000.00 | Riyadh | Street 367 | 13214 | Female | 1998-10-03 | NULL | NULL |
| 2001110457 | 1111219777 | Nourah | 555768494 | 2020-11-10 | 5000.00 | Riyadh | Street 443 | 14059 | Female | 2000-11-03 | NULL | NULL |
| NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

Retrieve from one table operations :

```
SELECT *
FROM DEPENDENT
WHERE Emp_id='1111219777' AND Dgender='Female';
```

| Dname | Emp_id | Dgender | Ddob |
|----------------|------------|---------|------------|
| ► Layan Khalid | 1111219777 | Female | 2000-09-01 |
| NULL | NULL | NULL | NULL |

Retrieve from more than two table (JOIN) operations :

```
SELECT Dphone_number , D_Name
FROM DEPARTMENT , EMPLOYEE
WHERE DEPARTMENT.D_number=EMPLOYEE.Dno;
```

| D_number | D_Name | Dphone_number | MgrId | Br_id |
|----------|-------------------------------|---------------|------------|-------|
| ► 1 | sales and marketing | 505184935 | 1111219777 | 1 |
| 2 | parts and maintenance | 556732487 | 1111219777 | 1 |
| 3 | management and administration | 555674289 | 2001110457 | 1 |
| 4 | customer service | 531256789 | 2001110457 | 1 |

| Dphone_number | D_Name |
|---------------|---------------------|
| ► 505184935 | sales and marketing |

- Supplier :

Description : Suppliers can deal the transactions with the warehouse manager so they have some information about him/her , and because they are the suppliers for the CARS and SPARE PARTS; they have access to all cars information , spare parts information and some of Warehouses information ,they also can monitor the registers information that related to cars and spare parts .

Their view :

| | | | |
|-----------------|----------------|--------------------|--------------------|
| Car_ID | Car_Modelname | Car_Brand | Car_Cost |
| Car_Modelnumber | SPart_number | Car_Quantity | Spart_Brand |
| Spart_name | Spart_price | Spart_quantity | Car_color |
| WManeger_ID | WManeger_name | Warehouse_location | Warehouse_capacity |
| Agency_name | Agency_country | Agency_city | Agency_state |
| Agency_street | Agency_zipcode | Agency_email | Agency_phone |
| Invoice_number | Issue_Date | SupTotal | Taxes |
| WManeger_phone | | | |

Possible Operations :

Retrieve :

```
SELECT wh_loc  
FROM WAREHOUSE ;
```

| wh_loc |
|---------------|
| ALKHARJ-11524 |

Update operations :

```
UPDATE AGENCY  
SET Ag_email='Aljomal230@gmail.com'  
WHERE Ag_name='Aljomaih' ;
```

| Ag_name | Ag_country | Ag_city | Ag_state | Ag_street | Ag_zipcode | Ag_email | Ag_phone |
|----------|--------------|---------|----------|-----------|------------|----------------------|-----------|
| Aljomaih | SAUDI ARABIA | RIYADH | AL KHARJ | NULL | 11512 | Aljomal230@gmail.com | 575252521 |

-INSERT , DELETE :

The supplier does not have the Authorisation to insert or delete.

- Customer :

Description :

A customer has the most limited access permission to the database, they only access the information regarding themselves, their financial details and their insurance coverage company. Their view also shows their payment information and what they have already purchased from the car shop, they are also informed if the purchased product is still in the warehouse or did it arrive at the branch so they can pick them up.

They can see the carshop's products and its Maintenance services.

Their view :

| | | | |
|---------------------------------------|------------------|--------------------|------------------------|
| Customer_ID | Customer_Name | Customer_Phone | Customer_City |
| Customer_Street | Customer_Zipcode | Insurance_Number | Insurance_Name |
| Insurance_Phone | Insurance_Email | Insurance_Plan | Finance_Name |
| Finance_City | Finance_Street | Finance_Zipcode | Finance_Phone |
| Finance_Email | IBAN | PInvoice_Number | Issue_Date |
| QuantityOfCar_InPaymentInvoice | Customer_salary | Car_ID | Car_cost |
| Plat_number | Plat_letter | Model_number | Model_name |
| SupTotal | Taxes | Total | Pament_Type |
| QuantityOfSpareParts_InPaymentInvoice | Agency_Name | SPart_Name | SPart_Number |
| SPart_price | SPart_Brand | Warehouse_location | Finance_Plan |
| Employee_ID | Employee_Name | Car_color | //Maintenance_end_date |

Possible Operations :

Insert operations :

```
INSERT INTO CUSTOMER  
VALUES ( '1113856493','Alsulaiman','534310699','Alqassim','King  
fahad st','45686','5000.00','1023456767','alinma  
bank','Tawuniya');
```

Delete operations :

Cannot delete anything but they can request an employee to delete their info

Update operations :

```
UPDATE CUSTOMER
SET
Cphone = '0534310999',
Ccity = 'Jeddah',
Cstreet = 'Abo Baker st',
Czipcode = '668757',
Csalary = '30000'
WHERE Cust_id = '1112452376';
```

| Cust_id | Cust_name | Cphone | Ccity | Cstreet | Czipcode | Csalary | Insurance_num | FinName | InsuranceName |
|------------|------------|-----------|----------|---------------|----------|----------|---------------|-------------|---------------|
| 1023242099 | Alanoud | 522359378 | Jeddah | Street 455 | 12256 | 25000.00 | 1034684756 | alinma bank | Tawuniya |
| 1112452376 | Abdullah | 534310999 | Jeddah | Abo Baker st | 668757 | 30000.00 | 1034567934 | alinma bank | Tawuniya |
| 1113856493 | Alsulaiman | 534310699 | Alqassim | King fahad st | 45686 | 5000.00 | 1023456767 | alinma bank | Tawuniya |
| HULL | HULL | HULL | HULL | HULL | HULL | HULL | HULL | HULL | HULL |

Retrieve from one table operations :

```
SELECT Pname , Price,Pbrand
FROM SPAREPARTS
WHERE Pname = 'speed sensor' AND Price = 1900 AND Pbrand =
'Ford Parts and Accessory';
```

| Pname | Price | Pbrand |
|--------------|---------|--------------------------|
| speed sensor | 1900.00 | Ford Parts and Accessory |
| | | |
| | | |

Retrieve from more than two table (JOIN) operations :

```
SELECT model_name
FROM CAR,CAR_COLOR
WHERE Car_id=Cr_id AND Availability = True AND Cost <= 200000
And Color='Black' ;
```

| model_name |
|----------------------|
| TeslaLuxury Vehicles |

6. Implementation

Connection code :

```
import java.sql.*;

public class Main {
    public static final String URL =
"jdbc:mysql://localhost/charshop";
    public static final String USER = "root";
    public static final String PASSWORD = "ssgeY0x2()7";
    public static void main(String[] args) {

        try {
            Connection connection =
DriverManager.getConnection("jdbc:mysql://localhost/charshop", "r
oot", PASSWORD);
            Statement statement = connection.createStatement();
            ResultSet rs = statement.executeQuery("select * from
WAREHOUSE");
            while (rs.next()) {
                System.out.println(rs.getString("Wh_loc")+""
+rs.getString("Capacity"));
            }
            //String q = "INSERT INTO WAREHOUSE (Wh_loc, Capacity)
VALUES('Obikan', '350')";
            //System.out.println(statement.executeUpdate(q)); //statement.exe
cuteUpdate(q) returns 1
        }
        catch (Exception ex)
        { ex.printStackTrace(); }
    }
}

// for gui : .  

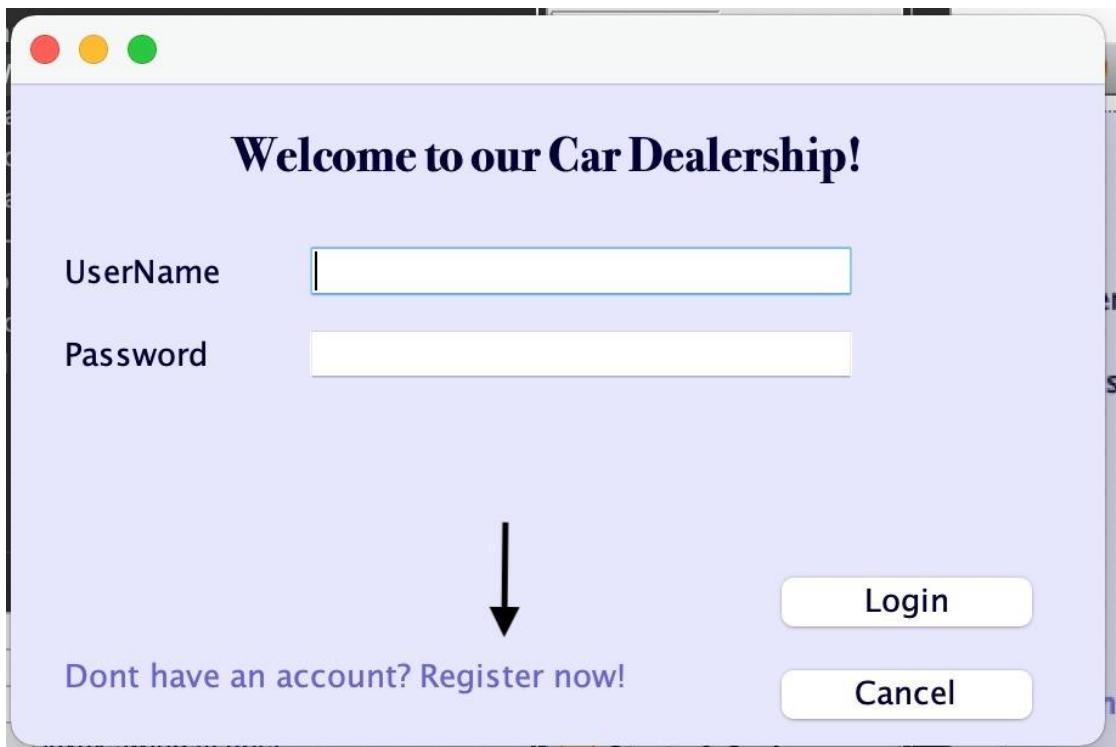
static Connection con() {
    try {
        String driver ="com.mysql.jdbc.Driver";
        Class.forName(driver);
        return
DriverManager.getConnection("jdbc:mysql://localhost/charshop", "r
oot", "ssgeY0x2()7");
    } catch (Exception ex)
    { ex.printStackTrace();
        System.out.println("Connection failed!"+ex);
    }
    return null;
}
```

USER “ CUSTOMER” :

Delete :

Cannot delete anything.

Insert: “Inserting a new customer “



The image shows a sign-up screen titled "Sign up". It contains ten input fields arranged in two columns. The left column includes fields for "ID", "Name", "Phone", "City", and "Street". The right column includes fields for "Finance Company", "Insurance Company", "Insurance Number", "ZipCode", and "Salary". At the bottom of the screen are two buttons: "Go Back" and "Save".

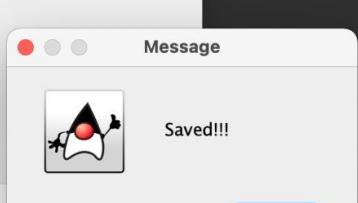
| | | | |
|--------|----------------------|-------------------|----------------------|
| ID | <input type="text"/> | Finance Company | <input type="text"/> |
| Name | <input type="text"/> | Insurance Company | <input type="text"/> |
| Phone | <input type="text"/> | Insurance Number | <input type="text"/> |
| City | <input type="text"/> | ZipCode | <input type="text"/> |
| Street | <input type="text"/> | Salary | <input type="text"/> |

| | | | |
|-----------------------|------------|-------------------|-------------|
| ID | 1928384756 | Finance Company | alinma bank |
| Name | Shoog | Insurance Company | Tawuniya |
| Phone | 584756839 | Insurance Number | 1029384657 |
| City | Riyadh | | |
| Street | Sail | | |
| ZipCode | 94857 | | |
| Salary | 45000.00 | | |
| <button>Save</button> | | | |

| | | | |
|---------|------------|-------------------|-------------|
| ID | 1928384756 | Finance Company | alinma bank |
| Name | Shoog | Insurance Company | Tawuniya |
| Phone | 584756839 | Insurance Number | 1029384657 |
| City | Riyadh | | |
| Street | Sail | | |
| ZipCode | 94857 | | |
| Salary | 45000.00 | | |

Code Snippet:

```
148, 16);  
ceNumber);  
e Company");  
  
Message
```



Sign up

| | | | |
|--------|------------|-------------------|-------------|
| ID | 1029485684 | Finance Company | alinma bank |
| Name | Haila | Insurance Company | Tawuniya |
| Phone | 574839801 | Insurance Number | 1029465849 |
| City | Riyadh | ZipCode | 49574 |
| Street | 293 | Salary | 50000.00 |

[Go Back](#) [Save](#)

Sign up

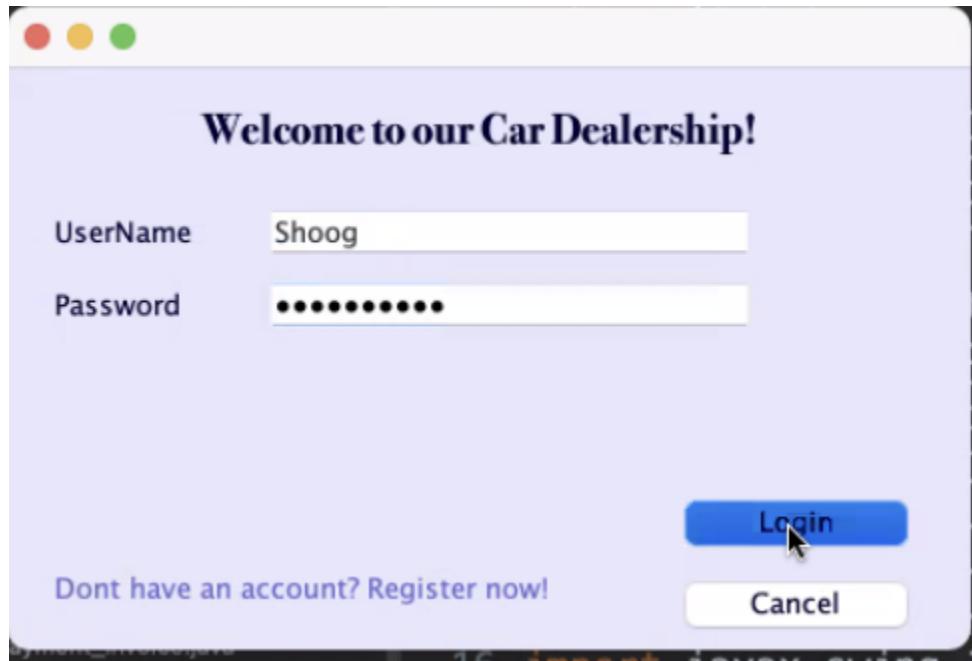
| | | | |
|--------|------------|-------------------|-------------|
| ID | 1029485684 | Finance Company | alinma bank |
| Name | Haila | Insurance Company | Tawuniya |
| Phone | 574839801 | Insurance Number | 1029465849 |
| City | Riyadh | ZipCode | 49574 |
| Street | 293 | Salary | |

[Go Back](#) [Save](#)

 Message
Saved!!!

OK

- *Update :*



UPDATE ALL INFO

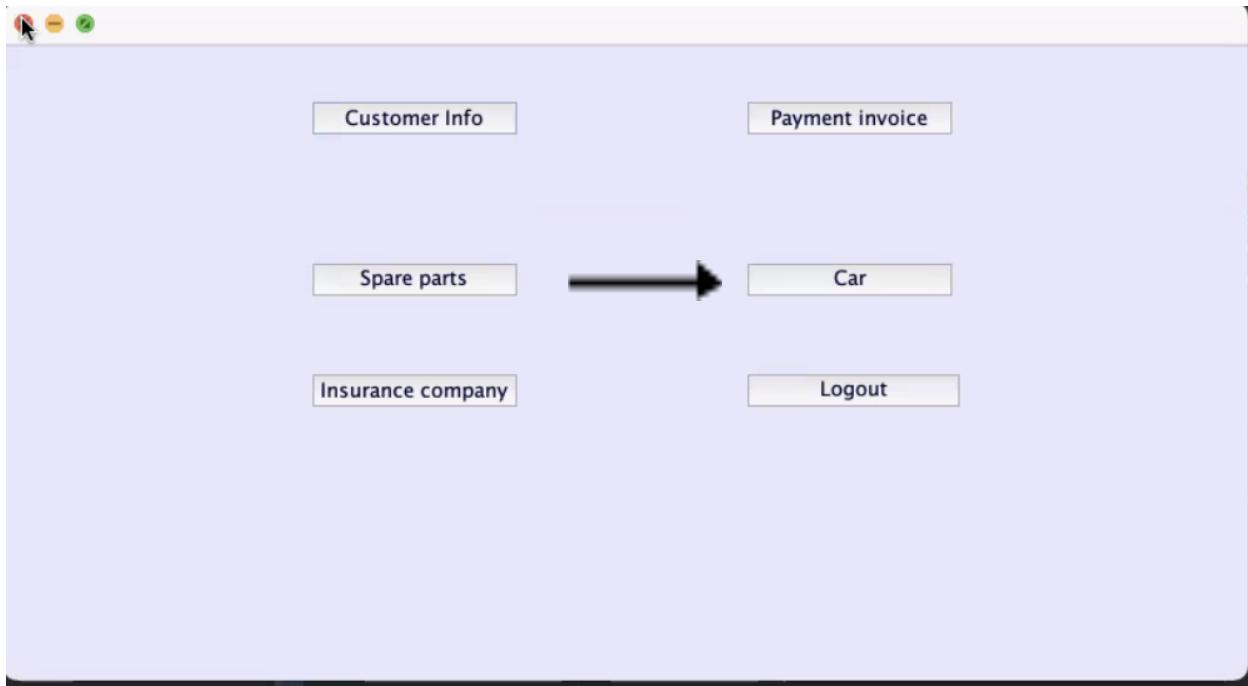
| | | | |
|---------|------------|-------------------|-------------|
| Phone | 5847568930 | Finance Company | alinma bank |
| City | Qassim | Insurance Company | Tawuniya |
| Street | noor st | Insurance Number | 1092837465 |
| ZipCode | 39487 | | |

Confirm

Result Grid Filter Rows: Search Export/Import:

| Cust_id | Cust_name | Cphone | Ccity | Cstreet | Czipcode | Csalary | Insurance_num | FinName | InsuranceName |
|------------|------------|-------------|----------|---------------|----------|----------|---------------|-------------|---------------|
| 1029485684 | Haila | 574839801 | Riyadh | 293 | 49574 | 50000.00 | 1029465849 | alinma bank | Tawuniya |
| 1112452376 | Abdullah | 534310999 | Jeddah | Abo Baker st | 668757 | 30000.00 | 1034567934 | alinma bank | Tawuniya |
| 1113856493 | Alsulaiman | 534310699 | Alqassim | King fahad st | 45686 | 5000.00 | 1023456767 | alinma bank | Tawuniya |
| 1928384756 | Shoog | 58475689... | Qassim | noor st | 39487 | 45000.00 | 1029384657 | alinma bank | Tawuniya |
| | | | | | NUL | NUL | NUL | NUL | NUL |

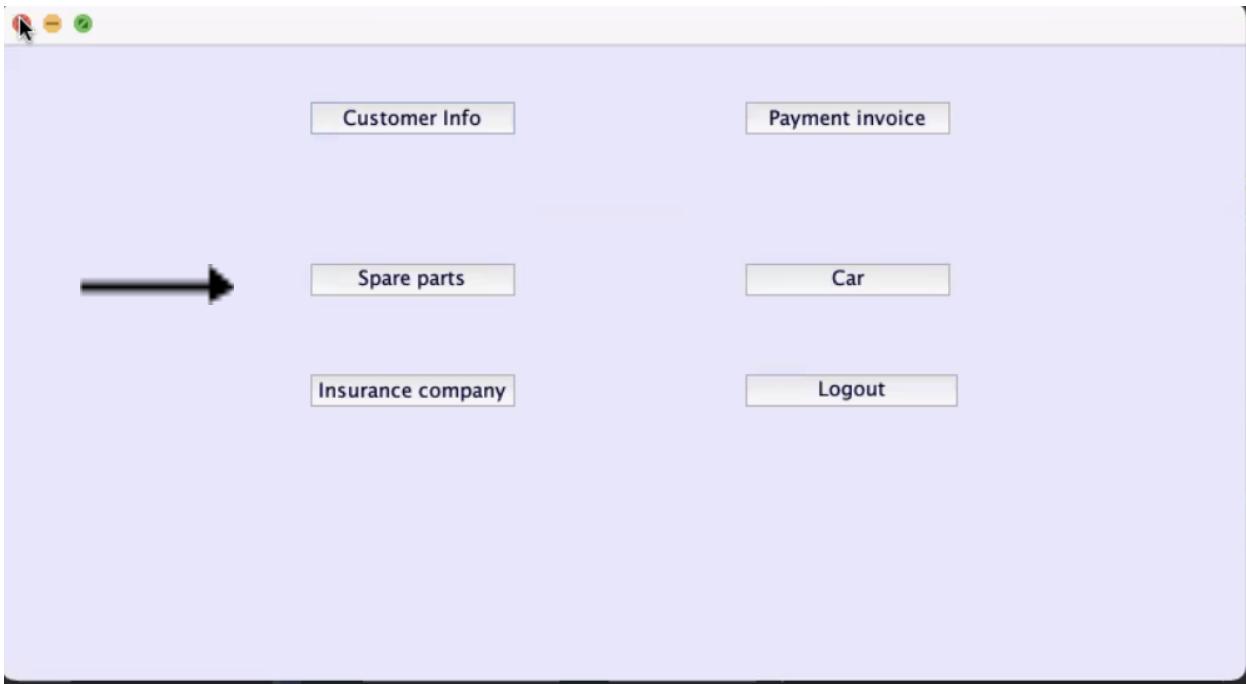
- *Retrieve :*



A screenshot of a software application window titled "Our Cars:". The window displays a table of car information. The columns are labeled: Car ID, Availability, Cost, PlateNum, PlateLetters, ModelNum, and ModelName. The data is as follows:

| Car ID | Availability | Cost | PlateNum | PlateLetters | ModelNum | ModelName |
|-------------------|--------------|-----------|----------|--------------|----------|----------------------|
| 1CAVUD355XAE20398 | 1 | 180000.00 | 1111 | AAA | 2021 | TeslaLuxury Vehicles |
| 2CAVUD355XAE20398 | 1 | 350000.00 | 1122 | BBB | 2020 | BMW M3 |
| 4CXBH41JDXC109842 | 0 | 180000.00 | 1423 | NUD | 2021 | XT5 |

At the bottom left, there is a "Back" button with a mouse cursor pointing at it.



| Part Number | Name | Price | Brand | Quantity |
|-------------------|--------------|---------|--------------------------|----------|
| 3SAVUD35SXAЕ20398 | speed sensor | 1900.00 | Ford Parts and Accessory | 140 |

Our Spare Parts

Back

7. Difficulties

One of the first difficulties we faced was trying to find car shops that were willing to help us write the correct requirements in our database. We eventually got the information we needed through other sources and experts.

Another difficulty was trying to connect the GUI with our database, some given instructions were out of date and weren't compatible with the latest updates. But after researching and contacting some MySql experts we were able to solve this problem.