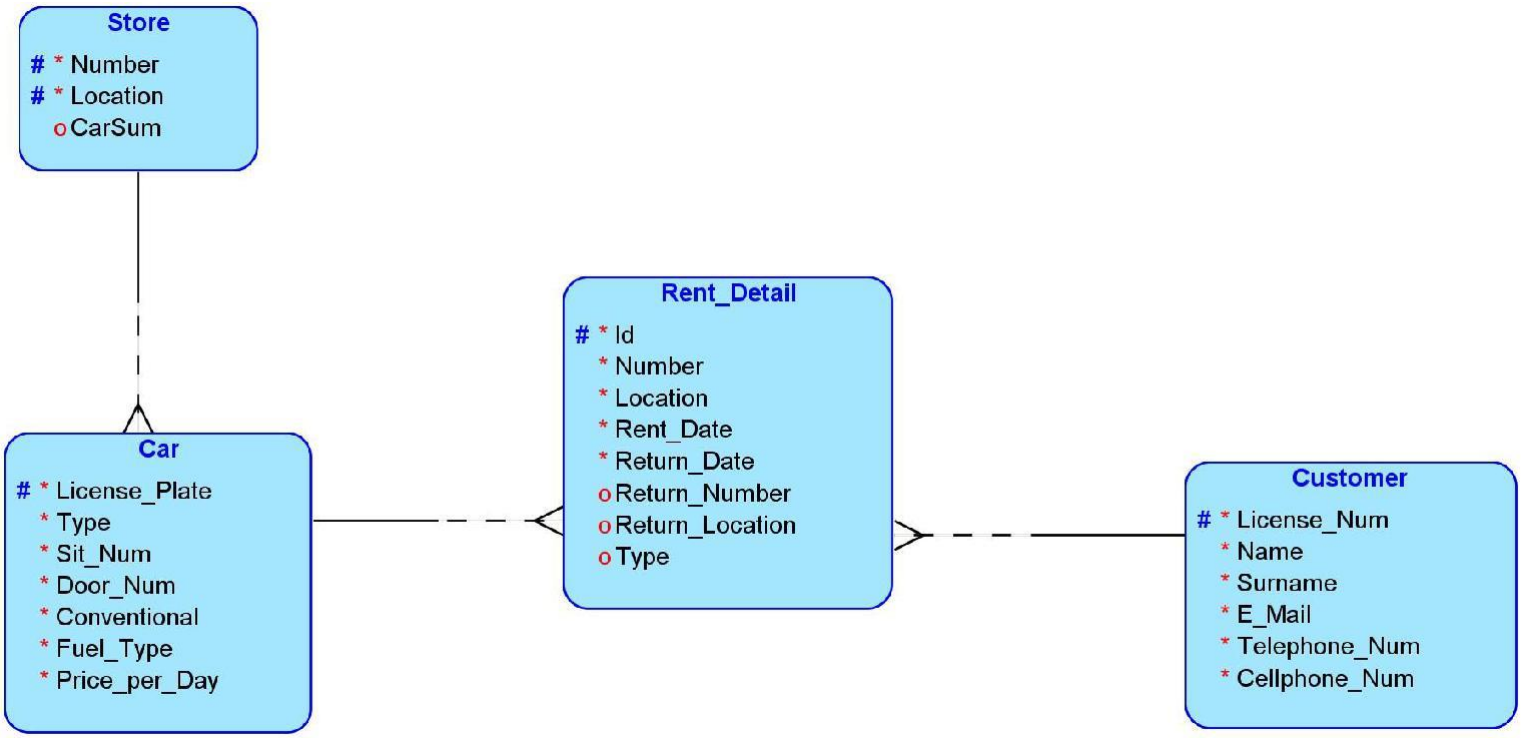
Database design

Charalampos Charalampous

A. Correlation entity chart



B. Article 428(1)(a) of CRR

I found 4 entities covering the exercise's voice and the requested database. So I made ***entities shop, car, customer*** and ***rental.*** Each has the requested fields.

- ***The shop*** has:

  Store Address(=number/primary key), Store location(=location/primary key), Store Car Count(=Carsum/null).

- ***The vehicle*** has:

  Vehicle number plate(=License_plate/primary key),
  Vehicle type(=type/not null),
  Number of vehicle seats(=sit_Num/ not null),
  Number of vehicle doors(=door_Num/ not null), conventional vehicle(=conventional/ not null),

Car fuel type(=Fuel_type/ not null), price per Car day(=price_per_day/ not null), and two foreign keys from **Shop entity,** Store Management (=number/foreign key), Store location(=location/foreign key).

I simply tied them to **"has"**, it is **1(shop)n(car)** and **it is mandatory-optional(shop)** because there can be a shop without cars, but there can be no cars without a shop. (Limit SQL foreign keys).

- ***The Client*** has:

  Customer License number(=License_Num /primary key), Customer Name(=name/not null),
  Customer last name(=Surname/not null),
  Customer email address(=E_Mail/not null),
  Customer fixed Phone(=Telephone_Num/not null), Customer Mobile Phone(=Cellphone_Num/not null).

- ***The Rental*** has:

  Unique ID(ID=/primary key), Rental Store Management(number=/not null), Rental location(location=/not null), Rental day and time(Rent_date=/not null), return date and time(return_date=/not null), return Store Management(return_number=/null), return location(return_null), Car type, foreign vehicle type:

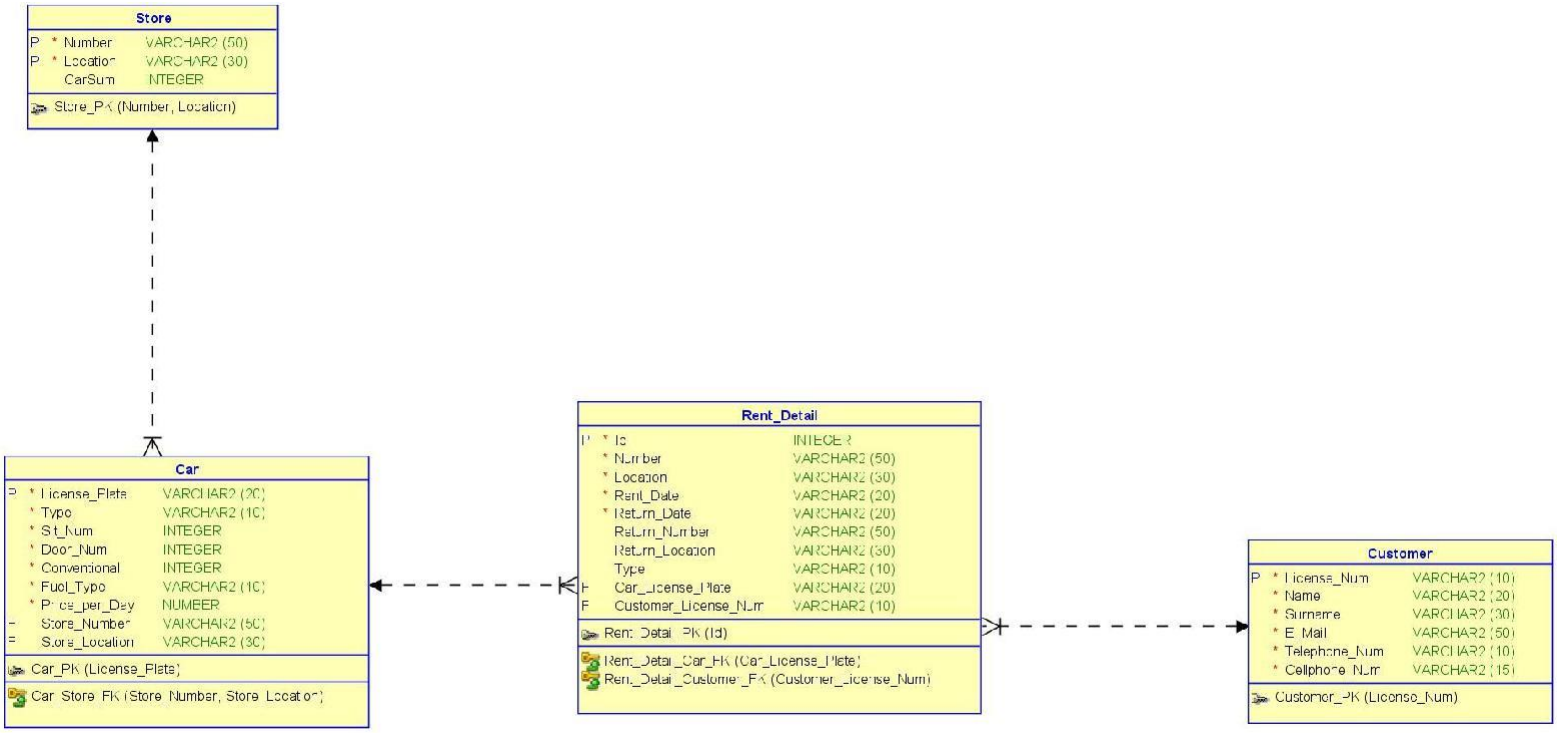
  Customer License number(=License_Num/foreign key). Its correlations are two, some of them simply **"has"** and are:
  1) **1(car)-n(rental)** and is

  Mandatory (car)-optional device(s) because there can be a car without

it has been rented, but there can be no rental rooms without a listed car.

2) **1-n(rental)** and is **mandatory-optional** layout(s) because there can be a customer without having rented a car.(-- This is, of course, my assumption that someone can subscribe to the company base without necessarily renting a car or simply leaving a customer without a rental car, staying in the customer base.) but there can be no rental rooms without any rental customers. (Limit SQL foreign keys).

Γ. Relational model



Δ. User Manual and Analysis ΕΦΑΡΜΟΓΗΣ

H application consists of the class that contains the menu and the class that contains the functions of the database.

- First, the application function asks if the user wants to connect to the database. If **“no” answers**, the application terminates. **“yes” answers** establish the connection to the base. After the connection is made, starts the

create tables, automated. For resource efficiency and proper information printing, a help table with a unique counter field, starting at 0, has been created and each time we have a link, it increases by 1. So for the creation of the other tables on the basis, those we want, we have assumed that they will run their code only when citter=1, so the first time they are docked (Figure 1). When disconnected and reconnected, the counter becomes larger than 1, thus omitting to run table generation commands, and hence the corresponding messages(Figure 2).

```
Connect to the Database?(Yes/No):yes
Connected to database.
Help table successfully created in database.
Creating table store in database.
Store table successfully created in database.
Creating table car in database.
Car table successfully created in database.
Creating table customer in database.
Customer table successfully created in database.
Creating table rent_detail in database.
Rent_detail table successfully created in database.
~~~Welcome to Exclusive rent a car system manager~~~
Welcome to main menu!
To access the database manager enter '1', to access the rent utility enter '2', to exit the system enter '-1':
```

Figure 1

```
Connect to the Database?(Yes/No):yes
Connected to database.
~~~Welcome to Exclusive rent a car system manager~~~
Welcome to main menu!
To access the database manager enter '1', to access the rent utility enter '2', to exit the system enter '-1':
```

Figure 2

- It then opens the application menu that runs repeatedly until we give it **"-1"** as an argument. The menu has levels, *administrator level*, *employee level,* and *exit the application*. Each level also has its own choices which we will see below.

  In the case of **"-1"** we therefore have the option if we want to permanently delete the tables(Figure 3) or simply exit the system(Figure 4).

```
Do you want to drop the tables?('yes'/'no'):yes
Successfully deleted all tables.
Disconnected from database.
Goodbye!
```

Figure 3

```
Do you want to drop the tables?('yes'/'no'):no
Disconnected from database.
Goodbye!
```

Figure 4

- In the case of **"1"**, the *administrator menu (*Figure 5) is launched, where **we can select -1-** *to add a new store*, with **the option -2-** *to add a new car* to a store, with **option -3-** *to withdraw a car* and **with option -0-** *return to the home menu.*

```
1
Welcome Admin!
Choose: '1' to add a store, '2' to add a car, '3' to delete a car, '0' to go back to main menu.
```

Figure 5

- The **-1- option** is to *add a new store*. Simply enter the address first and then the store area(Figure 6).

```
1
Enter the store address:Karaolh kai Dhmhtriou 80
Enter the store location:Peiraias
Store successfully added.
```

Figure 6

- Option **-2-** is to *add a new car* to a store. Enter the registration number, car type, number of seats, number of doors, if conventional, fuel type, price per day, shop address and location to which we want the car to be added(Figure 7).

```
2
Enter the car's license plate:AAA0000
Enter the car's type:Jeep
Enter the car's sit number:5
Enter the car's door number:4
Is the car conventional('yes'/'no'):no
Enter the car's fuel type:Petrol
Enter the car's price per day:10,5
Enter the car's store address:a
Invalid input. Store address not found.
Enter the store address:karaolh kai dhmhtriou 80
Enter the car's store location:a
Invalid input. Store location not found.
Enter the store location:peiraiaS
Car successfully added.
```

Figure 7

- The **-3- option** is to *remove a car* from a shop. We simply enter the registration number(Figure 8).

```
3
Enter the car's license plate:Aaa0000
Car rents successfully deleted.
Car successfully deleted.
```

Figure 8

- In the case of **the "2" (***Home menu*), the *employee's menu (*Figure 9) begins where **we can with the `1`** *display all the cars*(rented or not) of a store, with **the option `2`** *display all the cars* in a store *that is currently rented*, with **`3`** renting *a car* and **with `0`** *returning to the home menu.*

Figure 9

- **`1`** is to *display all cars* in a store. Just enter the address first and then the store area. All Store cars are returned to a list and all features are displayed (Figure 10).

```
1
Enter the store address:a
Invalid input. Store address not found.
Enter the store address:karaolh kai dhmhtriou 80
Enter the store location:a
Invalid input. Store location not found.
Enter the store location:peiraias
License Plate   Type    Sits    Doors   Conventional    Fuel Type       Price/Day
AAA0000         Jeep    5       4       No              Petrol          10.5
```

Figure 10

- **`2`** is to *display all cars* in a store *that are currently rented*. Just enter the address first and then the store area. All of its vehicles are listed

```
2
Welcome Employee.
Choose: '1' to show all cars in a store, '2' to show all cars rented at the moment in the store, '3' to rent a car, '0' to go back to main menu.
```

store and shows all their features and in addition the date of rental and the date of return of the car(figure 11).

```
2
Enter the store address:a
Invalid input. Store address not found.
Enter the store address:karaolh kai dhmhtriou 80
Enter the store location:a
Invalid input. Store location not found.
Enter the store location:peiraias
License Plate   Type    Sits    Doors   Conventional    Fuel Type       Price/Day       Rent Date               Return Date
AAA0000         Jeep    5       4       No              Petrol          10.5            01-06-2018 12:00:00     08-06-2018 11:00:00
```

Figure 11

- **`3` is** to *rent a car.*

  We import Store Management, Store Area, return Store Management, return location, Rental date, return date, and after Car Type. Returns a list of the cars available to rent and their characteristics. We select the car we want based on its number plate and after displaying the booking details and in addition the number plate and total rental cost we can choose confirm or not Rental. If **"no" is selected** then the reservation is canceled and returned to the menu