

# Project Assignment 2

BetterBe 3

Mark Zhitchenko (s2746557)  
Katy Radzkova (s2646749)  
Thijs Frauenfelder (s2739127)  
Ayolt ten Have (s2746557)  
Victor Zugravu (s2780941)  
Dani Mahaini (s2746557)

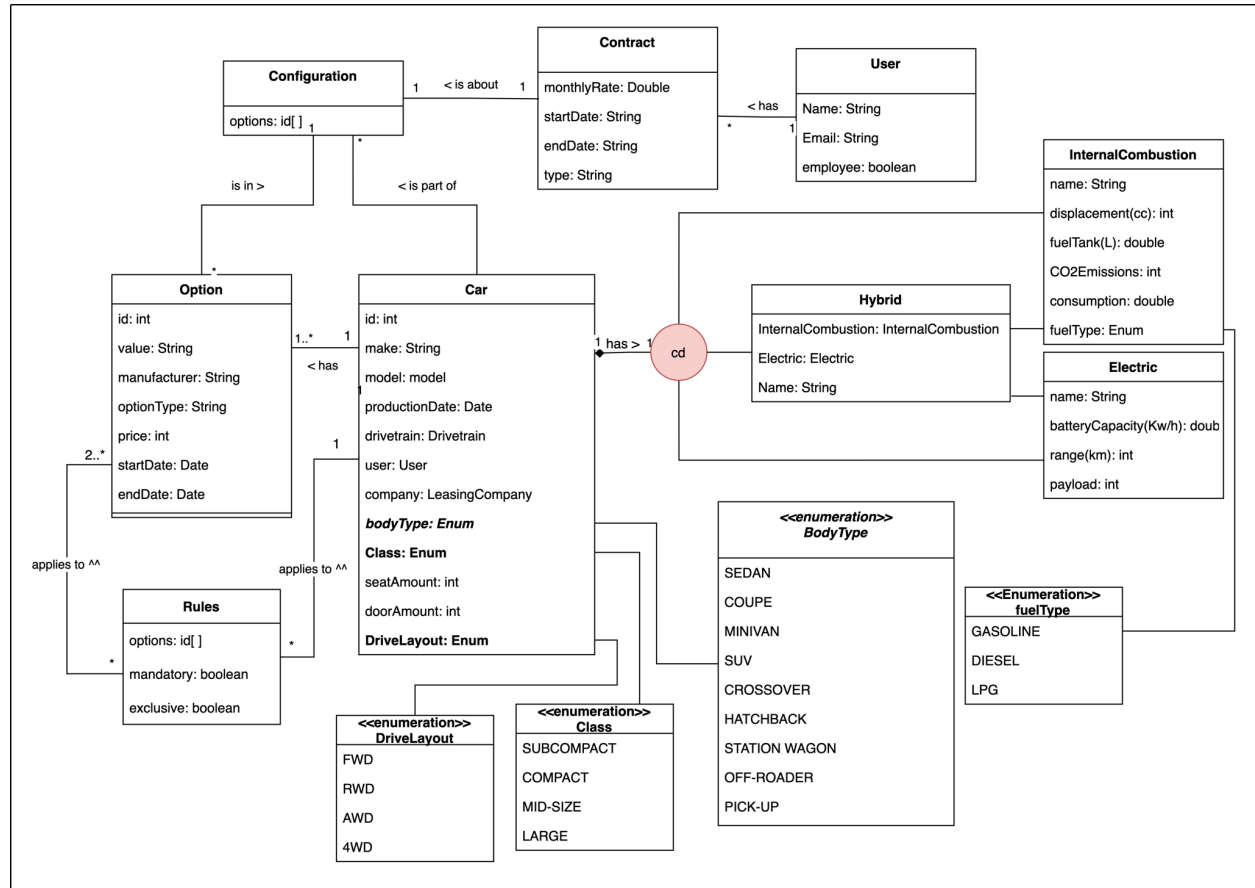
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## Diagram showcase



### Diagram description

The class diagram describes everything a car can have, starting with the options and their rules ending with leasing company and users.

Every option that a car can have, should have certain rules, think of colour for example, one car can not have 2 colours simultaneously. There are also other options that need rules to be applied, that is why we created a separate class for rules. The Car class by itself has a lot of attributes and is connected to a lot of other classes, which makes it basically the centre of the class diagram. Except for the options the car has a Model, Drivetrain, LeasingCompany and User attached to it. The Model - Car relation has multiplicities 1 and 1..\*, since one or more cars can have the same model, but a car can only have 1 model, respectively. The Model class also uses two enumerations for the BodyType and Class.

The drivetrain of a car has a composite relation with a car, because drivetrain can not exist without a car, the multiplicity in this relation is obvious, one car can have one drivetrain. Drivetrain also makes use of an enumeration for the DriveLayout and has its own subclasses, namely Hybrid, Electric and InternalCombustion. The generalisation type is both covering and disjoint, since there can be only one drivetrain type, a car is either hybrid, electric or internal combustion based.

A LeasingCompany owns many cars, which is shown in the class diagram using corresponding multiplicities. A leasing company also has many employees that work for the company. A user can sign a contract with the leasing company, the contract can have two types, it's either a working contract if the user is an employee or it is a leasing contract if the user is a customer. Employee and Customer classes are both subclasses of the User, respectively. The generalisation type is cd(covering and disjoint), since a user can not be a customer and employee at the same time. Technically an employee can be a customer, but then he/she will need to create a separate customer account.

## Database Schema

*Based on the class diagram this DB schema has been derived:*

**rules**(options **PK**, mandatory, exclusive, car\_id **FK**,  
FK car\_id **REF** car(id))

**option**(id **PK**, value, manufacturer, car\_id **FK NOT NULL**, option\_type, price, start\_date,  
end\_date,  
FK car\_id **REF** car)

**car**(id **PK**, make, model, production\_date, body\_type, door\_amount, seat\_amount, class,  
engine\_type, drive\_layout)

**hybrid**(id **PK**, car **FK**, name, internal\_combustion **FK**, electric **FK**,  
FK car **REF** car(id),  
FK internal\_combustion **REF** internal\_combustion(id),  
FK electric **REF** electric(id))

**internal\_combustion**(id **PK**, horsepower, name, displacement, fuel\_tank, emissions,  
consumption, fuel\_type)

**electric**(id **PK**, horsepower, name, battery\_capacity, range)

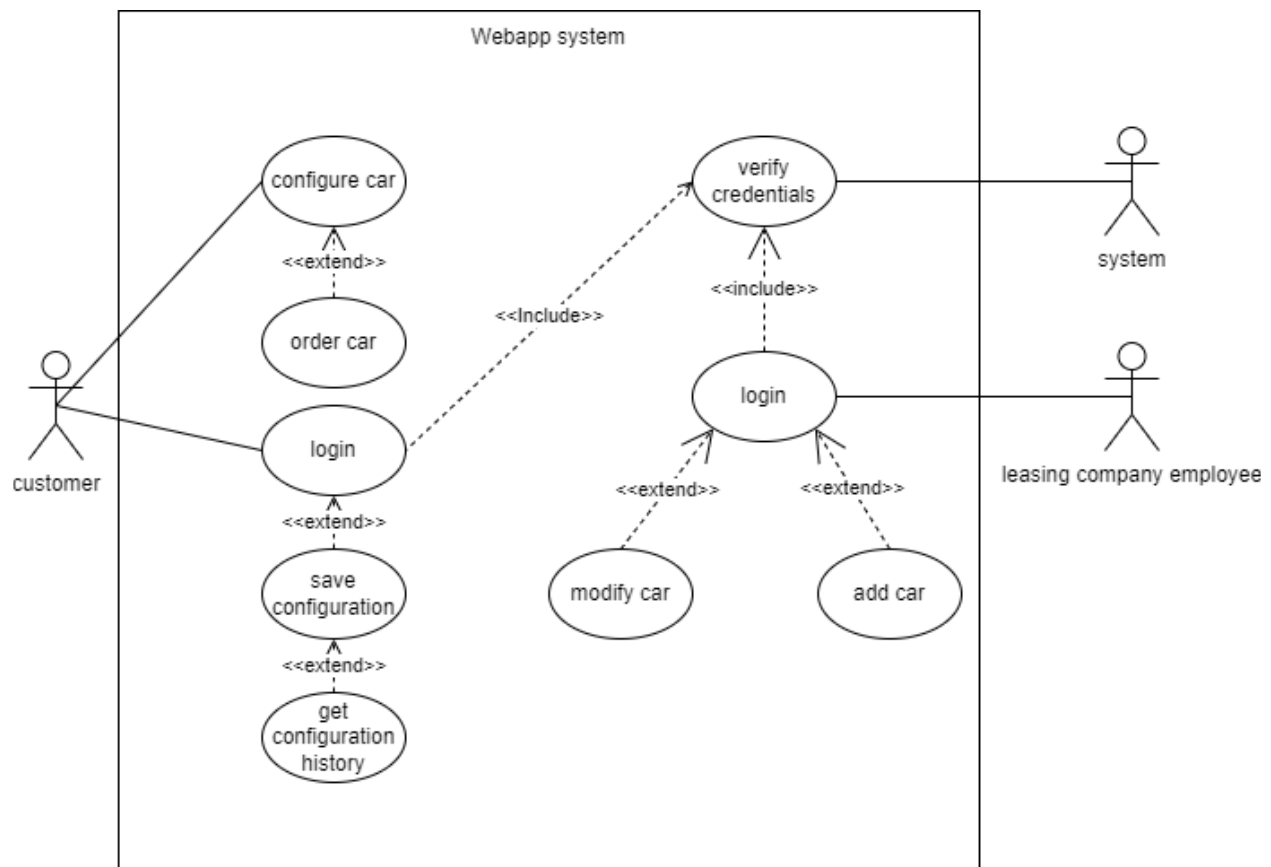
**user**(id **PK**, name, email, employee)

**contract**(id **PK**, customer **FK**, configuration **FK**, monthly\_rate, start\_date, end\_date,  
    **FK** customer **REF** customer(id)  
    **FK** configuration **REF** configuration(id))

**configuration**(id **PK**, customer **FK**, car **FK**, options,  
    **FK** customer **REF** user(id),  
    **FK** car **REF** car(id))

## Use Case Diagram

Diagram showcase



## Diagram description

In this use case diagram we exhibit the 3 actors that play a role in our web application system. Firstly, the customer is interested in configuring and then buying a car. To extend to the

functionality, we also intend on adding an account feature, so customers can save their chosen configurations and view them later if they're unsure about acquiring a car on the spot. On the other side we have the leasing company employee, who needs an account so they can securely add or modify car details in the database. Both customers and employees have their credentials verified by the system actor.