

# Assignment #1

## Logical Data Models and Use Case Model

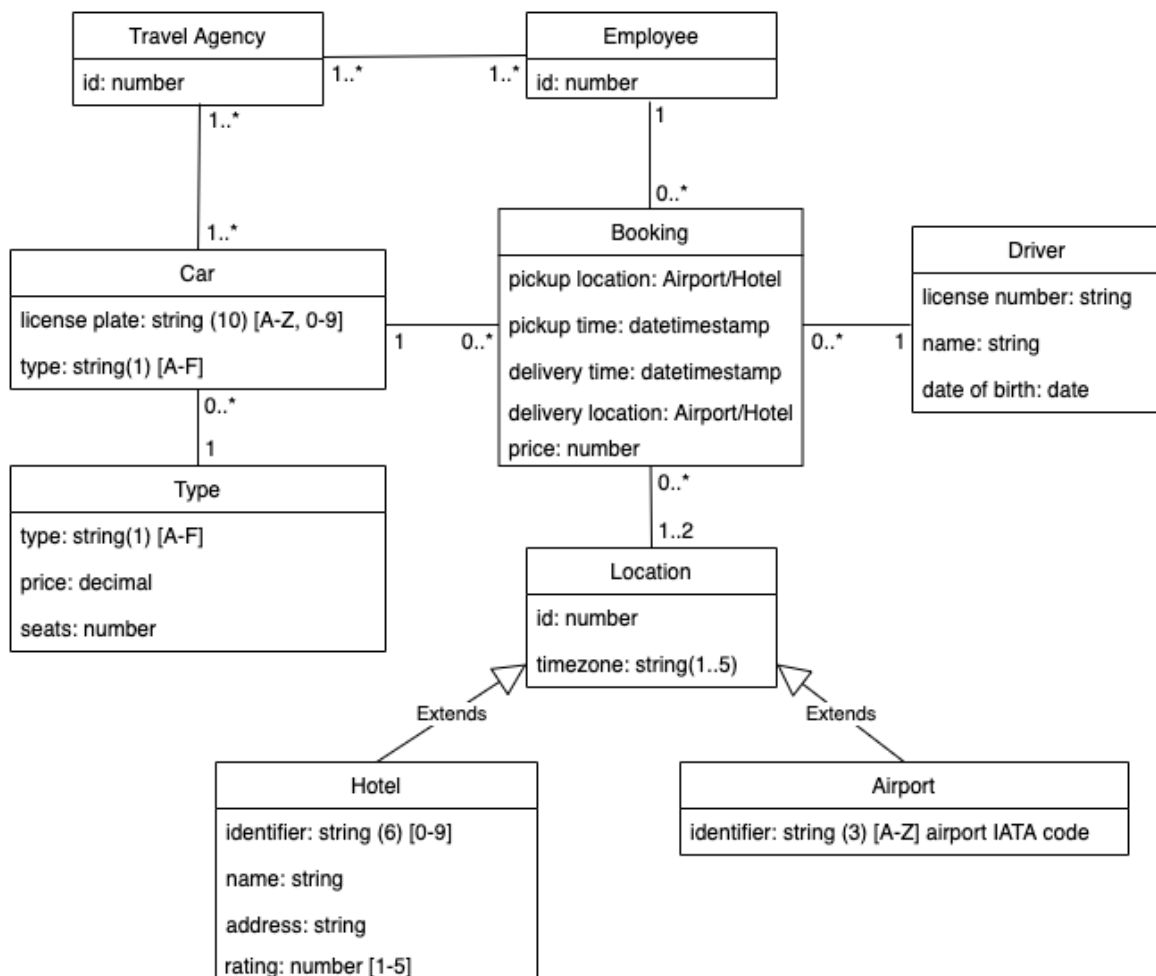
### Development Large Systems

#### Group 2:

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#### 1. Product Owner

##### 1.1 Logical Data Model



## Walkthrough

The above model represents the different data objects related to the Faraday Car Rental Company.

The attribute of the object is read as follows:

- The parenthesis following the data type indicates specified length
- The hard brackets indicate a specific restriction
- Example: *license plate: string (10) [A-Z, 0-9]* where:
  - o License plate is name
  - o String is the type
  - o (10) is the length. If omitted, assume default
  - o [A-Z, 0-9] further restrictions to the type, here it is only allowed to use upper-case letters between A and Z as well as numbers between 0 and 9.

Starting from the Booking object, if the delivery location is anywhere other than the pickup location, a fee should be added, calculated by the distance from the original pickup location.

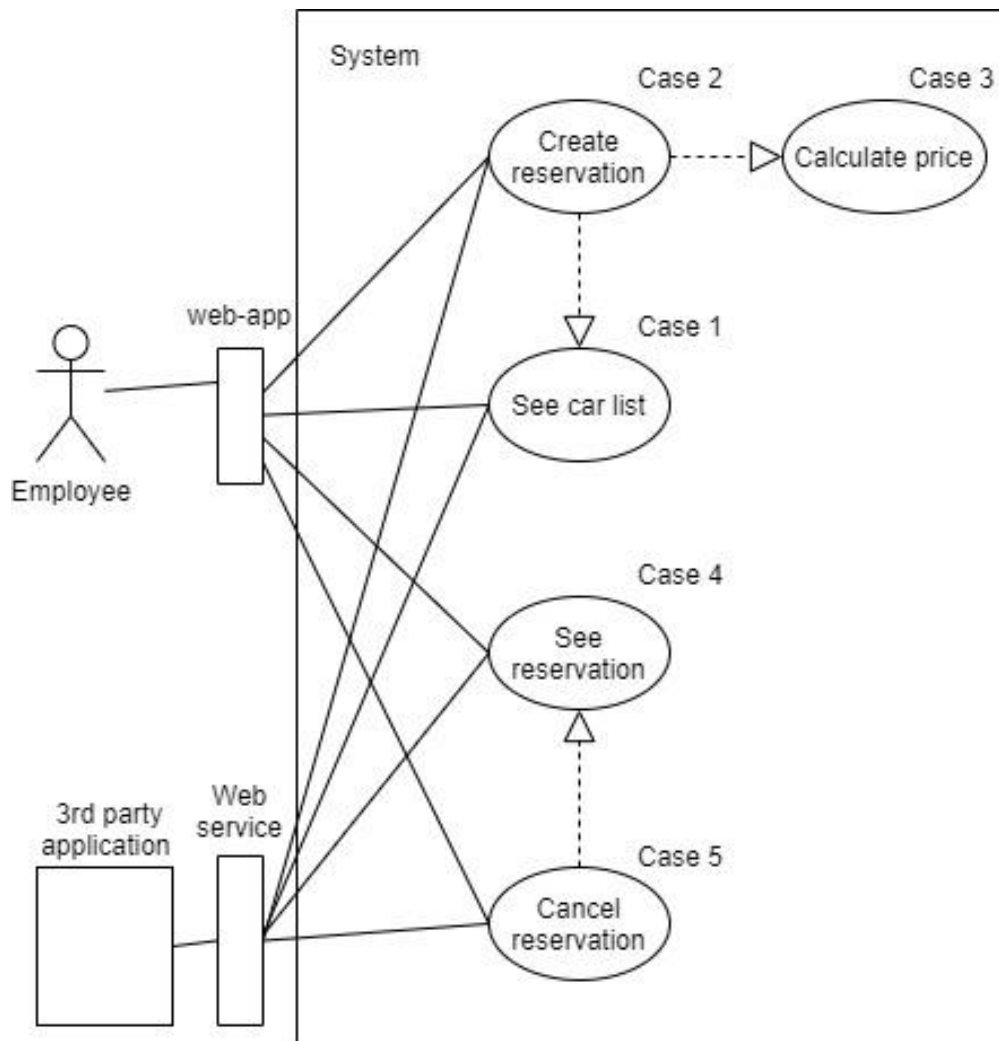
Timezones for the Hotels and Airports can either be represented as strings (example: CEST), intervals or to your liking. See links:

- <https://www.timeanddate.com/time/zones/>
- <https://stackoverflow.com/questions/13837258/what-is-an-appropriate-data-type-to-store-a-timezone>

The booking represents a reservation made by an employee, on behalf of the driver. A driver's date of birth should be equal to or above 25 years of age.

The Car related to the Booking has a type labeled by a single character from A to F, indicating the price and number of seats.

## 1.2 Use Case Model



### Walkthrough

The System has two actors:

- Employees in the travel agencies and possible 3<sup>rd</sup> party applications.
- The actors access the system though either a web-service or a web-application.

As seen above, the system has 5 Use Cases.

Use Case 2 requires both Use Case 1 and 3 to be completed. Use Case 3 calculates the price of the reservation, depending on the car type, as well as the distance between pick-up and delivery location.

Use Case 5 requires Use Case 4 to be executed. Since the employee must be able to see the reservation related to a given driver license number, before being able to cancel it.

The Use Cases 4 and 1 are both independent from the other Use Cases.

## Actor Descriptions

- Employee:
  - o Person who is an internal actor.
  - o Access system through web application
  - o Has all-access and can fully utilize all functions.
- 3rd party systems:
  - o Utilizes the web service

## Fully dressed Use Cases

Use Case	<b>Case 1: See car list</b>
Name	See Cars.
Scope	Faraday booking system.
Level	Employee Goal.
Primary Actor	Employee.
Stakeholders and Interests	Employee - See which cars are available for booking.
Preconditions	See list of (available) cars of specific type, in a given time period in a given location.
Postconditions	A list of cars is displayed.
Main Success Scenario	- Employee accesses system. - Employee fills search requirements (type, location, and time period) - List of car data is displayed to the employee
Extensions	
Special Requirements	None
Variations in Technology and Data	None
Frequency of Occurrence	Often
Miscellaneous	

Use Case	<b>Case 2: Create Reservation</b>
Name	Create reservation.
Scope	Faraday booking system.

<b>Level</b>	Employee Goal.
<b>Primary Actor</b>	Employee.
<b>Stakeholders and Interests</b>	Employee - To create a reservation for a customer. Customer - Getting a reservation for a car.
<b>Preconditions</b>	No reservation for given car in given time period, aswell as pickup and delievery time.
<b>Postconditions</b>	Reservation made for given car, list of cars updated, price calculated. If the place of delievery is different from the place of collection, an additional fee will be charged, depending on distance between the places.
<b>Main Success Scenario</b>	<ul style="list-style-type: none"> <li>- Employee accesses system searches for available car list (see cars use case)</li> <li>- Employee presses button to create reservation for selected car</li> <li>- Employee enters customer details and delivery location</li> <li>- System validates customer age (above 25)</li> <li>- System calculates the reservation price (Calculate price use case)</li> <li>- Reservation is created when price is confirmed by customer.</li> </ul>
<b>Extensions</b>	<p>If car is no longer available</p> <ol style="list-style-type: none"> <li>1. Return error message</li> </ol> <p>If customer is under 25 years old</p> <ol style="list-style-type: none"> <li>2. Customer is denied reservation</li> </ol>
<b>Special Requirements</b>	None
<b>Variations in Technology and Data</b>	None
<b>Frequency of Occurrence</b>	Often
<b>Miscellaneous</b>	

<b>Use Case</b>	<b>Case 3: Calculate Price</b>
<b>Name</b>	Calculate price
<b>Scope</b>	Faraday booking system.
<b>Level</b>	Subfunction
<b>Primary Actor</b>	System
<b>Stakeholders and Interests</b>	Employee - Calculate price of booking. - Inform customer of calculated price.

	Customer - See price of booking - Agree to price or not
<b>Preconditions</b>	Car type, pickup location and delivery location.
<b>Postconditions</b>	A price is calculated based on car type and time period, additional fee is based on pickup- and delivery location.
<b>Main Success Scenario</b>	<ul style="list-style-type: none"> <li>Employee creates reservation (not confirmed yet by customer)</li> <li>Price and possible additional fee is calculated based on booking information (locations and car type)</li> <li>Customer confirms reservation and agrees to price.</li> </ul>
<b>Extensions</b>	Car type invalid <ul style="list-style-type: none"> <li>Return error message</li> </ul> Invalid locations <ul style="list-style-type: none"> <li>Return error message</li> </ul>
<b>Special Requirements</b>	Car type (A... F) in a city in a given time period is displayed with each car.
<b>Variations in Technology and Data</b>	Possible changes in availability and data of each car displayed.
<b>Frequency of Occurrence</b>	Often. For each time a reservation is created.
<b>Miscellaneous</b>	

<b>Use Case</b>	<b>Case 4: See Reservation</b>
<b>Name</b>	See reservation.
<b>Scope</b>	Faraday booking system.
<b>Level</b>	Employee Goal.
<b>Primary Actor</b>	Employee.
<b>Stakeholders and Interests</b>	Employee - See specific reservation.
<b>Preconditions</b>	The employee must be able to see a reservation, given the driving license number from the reservation.
<b>Postconditions</b>	Display related data to a reservation from the given license number. Cancel reservation should be available for each reservation displayed.
<b>Main Success Scenario</b>	- Employee accesses system. - Employee searches for a reservation linked to given driver license - The reservation is displayed
<b>Extensions</b>	Driver license isn't in the system

	-Error is displayed
Special Requirements	None
Variations in Technology and Data	None
Frequency of Occurrence	Often
Miscellaneous	

Use Case	<b>Case 5: Cancel Reservation</b>
Name	Cancel reservation.
Scope	Faraday booking system.
Level	Employee goal.
Primary Actor	Employee.
Stakeholders and Interests	Employee - Cancel reservation for customer. Customer - Cancel their reservation.
Preconditions	The employee must be able to cancel a reservation, given a driving license number.
Postconditions	Reservation cancelled, car list updated.
Main Success Scenario	<ul style="list-style-type: none"> <li>- Employee accesses system.</li> <li>- Employee searches for a reservation linked to given driver license (see reservation use case)</li> <li>- Employee presses cancel reservation</li> <li>- Reservation canceled after employee confirmation</li> </ul>
Extensions	<ul style="list-style-type: none"> <li>• Reservation isn't cancelled <ol style="list-style-type: none"> <li>1. Couldn't cancel reservation</li> <li>2. Return to reservation</li> </ol> </li> </ul>
Special Requirements	Valid reservation
Variations in Technology and Data	Possible changes in data structure. License plates, customer information. Availability.
Frequency of Occurrence	Often, can occur for each reservation
Miscellaneous	

## 2. Reflection on organization in the group around the task solution.

- **Who participates in which roles?**
  - o We split up in 2 smaller groups A and B.
  - o Thanks to that we were able to contribute to the assignment in an equal way, group a worked on the use case while group b worked on the logical data model.
- **What technologies do you find useful?**
  - o Draw.io was utilized for the creation of our models, both the use case and logical data model.
  - o OneNote was used for documentation and coordination of the work.
- **What challenges do you have in working with?**
  - o Communication error within group A as they accidentally started working on wrong model. They were supposed to work on the Use Case model, but instead started working on the Logical Data model. This was quickly caught, and in hindsight this was not completely wasted time, as group A then had good insight to how the Logical Data model should/could look like.
  - o Splitting up work in groups both had pros and cons. The good thing about splitting up the work was that the time used to create the models was (assumedly) a lot shorter than what it would have been if both models were created together with the entire group. This also did cause cons as the input given while the models were created was limited between the two groups, which could have resulted in potential changes and views. We did however sit together after both groups were finished and reviewed each other's work, which did partly mitigate previous statement. Having smaller group also made it easier for everyone to contribute. Overall splitting up the work in the groups was both efficient and good in terms of learning.
  - o UML formatting was incorrect in the Use Case model, we had to freshen up on UML.
  - o We had some complication related to the lack of instructions before completing the assignment. This led to some confusion and inconsistencies between what was expected and what was done.
  - o We tried to clear details of the models with the customer, which resulted in models, we later were given negative feedback for.