

## Exercise

OCL Expressions with @pre



Prof. Dr. Bernhard Rumpe  
Lehrstuhl für Software Engineering  
RWTH Aachen

<http://www.se-rwth.de/>

# Exercise 5.1 - OCL expressions with @pre

1. If a vehicle has been sold, the list of all vehicles and the list of vehicles in the old location are both reduced by one.

# Exercise 5.1 – Solution 1

1. If a vehicle has been sold, the list of all vehicles and the list of vehicles in the old location are both reduced by one.

```
context Administration.sellVehicle(Vehicle v):  
  pre: (v != null) && vehiclePark.contains(v)  
  post: (vehiclePark@pre.size == vehiclePark.size+1)  
        && (v.location@pre.vehicles@pre.size ==  
           v.location@pre.vehicles.size+1)
```

## Exercise 5.1 – Expression 2

2. After a vehicle has been moved to a different location, it is in the vehicle list of the new location and not anymore in the vehicle list of the old location. In addition to that, the size of the lists is adapted accordingly.

## Exercise 5.1 – Solution 2

2. After a vehicle has been moved to a different location, it is in the vehicle list of the new location and not anymore in the vehicle list of the old location. In addition to that, the size of the lists is adapted accordingly.

```
context Location.addVehicle(Vehicle v) :
  pre: (v != null)
      && v.location.vehicles.contains(v)
      && !vehicles.contains(v)
  post: vehicles.contains(v)
      && !v.location@pre.vehicles.contains(v)
      && (v.location@pre.vehicles.size ==
          v.location@pre.vehicles@pre.size-1)
      && (vehicles.size == vehicles@pre.size+1)
```

## Exercise 5.1 – Expression 3

3. Vehicles whose state is changed to “rented” were before in the state “booked” or “available”.

## Exercise 5.1 – Solution 3

3. Vehicles whose state is changed to “rented” were before in the state “booked” or “available”.

```
context Vehicle.setState(VehicleState state):  
  pre: true  
  post: (this.state == VehicleState.rented)  
        implies  
          (this.state@pre == VehicleState.available)  
          || (this.state@pre == VehicleState.reserved)
```