ESOF 422 - Homework 1

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Question 1

Part 1

```
--getCharge operation in Rental class
getCharge():Real
        begin
                declare wrkCh:Real, m:Movie, pc:PriceCode,dy:Integer;
                m:=self.getMovie();
                dy:=self.getDaysRented();
                pc:=m.getPriceCode();

                wrkCh:=0;

                if pc=PriceCode::regular then
                        wrkCh:=2.0;
                        if dy > 2 then
                                wrkCh:=wrkCh + (dy -2) * 1.5;
                        end;
                end;

                if pc=PriceCode::family then
                        wrkCh:=1.5;
                        if dy > 3 then
                                wrkCh:=wrkCh + (dy -3) * 1.5;
                        end;
                end;

                if pc=PriceCode::newRelease then
                        wrkCh:=dy * 3.0;
                end;

                result:=wrkCh;
end

--getTotalCharge operation in customer class
getTotalCharge():Real
        begin
                declare totalCharge:Real, ch:Real;
                totalCharge:=0;
                for ren in self.rentals do
                        ch:=ren.getCharge();
                        totalCharge:=totalCharge + ch;
                end;
                result:=totalCharge;
        end;
```

Part 2

Question 2

.x

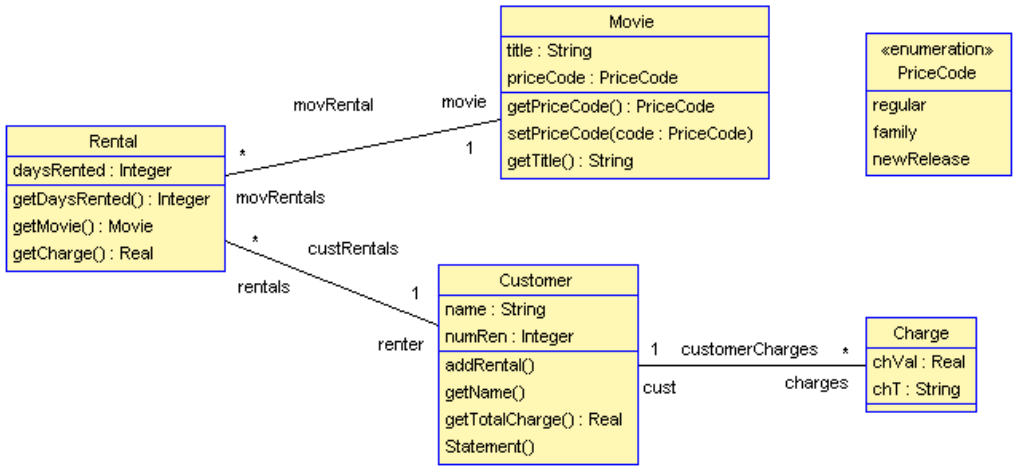

Figure 1: Class Diagram

1 Question 3

Part 1

```
context Company::hire(p:Person)
        pre hirePre1: p.isDefined()
        post hirePost1: employee->includes(p)

context Company::fire(p : Person)
        pre  firePre:  employee->includes(p)
        post firePost: employee->excludes(p)

context Person::raiseSalary(amount : Real) : Real
        post raiseSalaryPost:
                salary = salary@pre+amount
```

Citiation: http://useocl.sourceforge.net/w/index.php/Validate_pre-_and_postconditions

Part 2

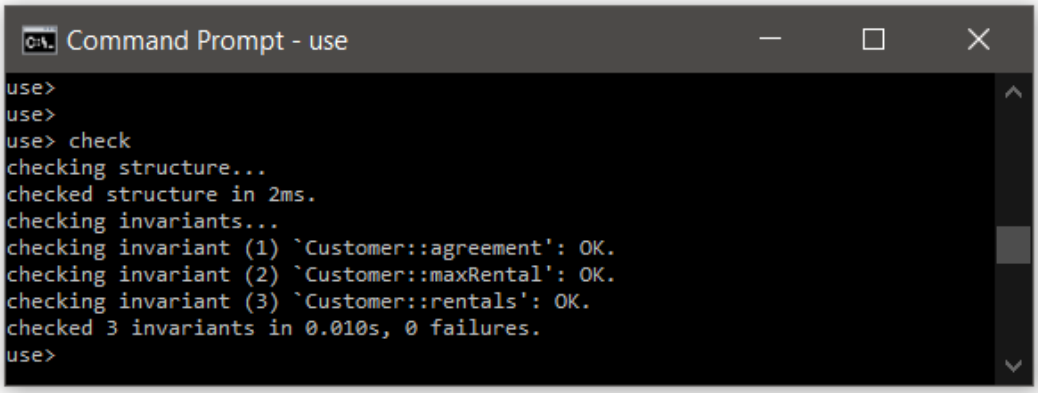

Figure 2: Object Diagram

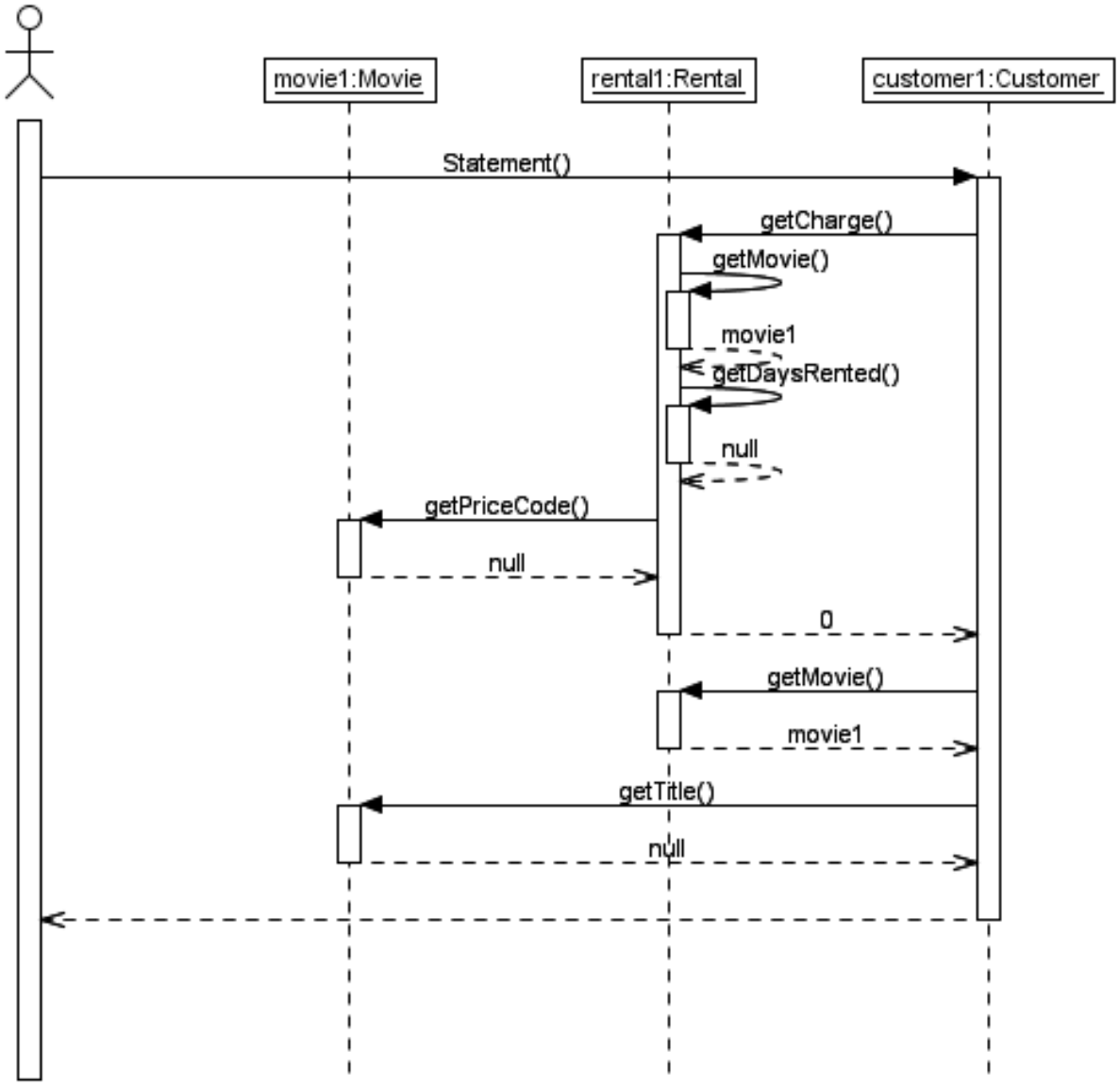

Figure 3: Sequence Diagram

```
use> !openter company1 hire(person1)
precondition `hirePre1' is true
use> !info vars
<input>:line 1:5 extraneous input 'vars' expecting EOF
use> info vars
[frame 1]
  p : Person = person1
  self : Company = company1
[frame 0]
  empty
[object variables]
  company1 : Company = company1
  person1 : Person = person1
  person2 : Person = person2
  person3 : Person = person3
use> !opexit
postcondition `hirePost1' is true
use> !openter company1 fire(person1)
precondition `firePre' is true
use> !delete (person1, company1) from P_C
use> !opexit
postcondition `firePost' is true
```

Figure 4: Hire and Fire Testing

```
use> !create person1:Person
use> !set person1.salary := 100
use> !openter person1 raiseSalary(10.0)
use> !set person1.salary := 110.0
use> !opexit 110
postcondition `raiseSalaryPost' is true
use>
```

Figure 5: raiseSalary Testing