Exercise list of UML Interface Specification

Exercises: October 11, 2019

1. By using OCL, let specify the operation: consigueDetallesCliente(in_cliente: IdentificadorCliente):DetallesCliente of the interface GestionClientes, which class diagram is shown in figure below.

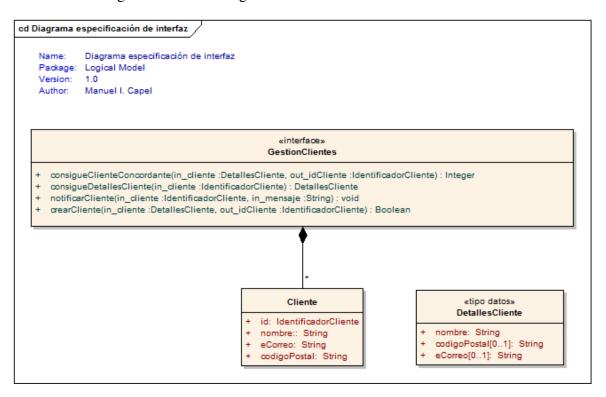


Figure 1: IIM ICustomerManagement

Note: OCL operations reference guide can be found at https://wiki.eclipse.org/ Acceleo/OCL_Operations_Reference

- 2. We need to develop an *interface information model* (IIM) of a enrollment system for universities around the World. The name of the interface will be <code>IEnrollment</code>:
 - getUniversity(Imagine which parameters has to have this operation):UniversityDetails
 - getCourse(Imagine which parameters has to have this operation):void
 - makeEnrollment(Imagine which parameters has to have this operation):enrollmentAcknowledge

Other entities in the asked IIM to be defined:

- University
 - Name
 - Identifier
 - Shanghai ranking
 - Tuition fee per year
 - Any missing other that could be important too

- College or Faculty
 - Name
 - Application dates range
 - Any missing other that could be important too
- Course
 - Name
 - Teaching dates
 - SeatsAvailableAtDate
 - Any missing other that could be important too
- Enrollment
 - Reference
 - CourseCode[1..n] courses
 - Any missing other that could be important too
- Student
 - Name
 - e-Mail
 - postCode
 - Any missing other that could be important too
- 3. By using OCL, let specify the operation <code>getStudentDetails(in_student: StudentIdentifier)</code> is an operation of the interface <code>StudentManagement</code>, which is included in a UML Interface Diagram to the one shown in figure below (interface class for general student management):

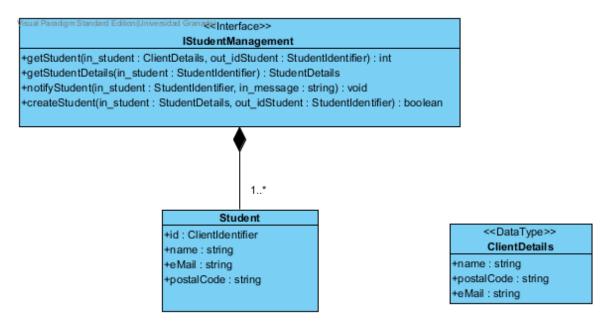


Figure 2: IIM IStudentManagement

- 4. Taking into account the Responsibility Diagram of Interface given by figure 3, specify with OCL the following invariants:
 - (a) All flights objects must have a duration attribute that is less than 4 hours
 - (b) The maximum number of passengers on a flight may not exceed 500
 - (c) For every passenger, the age attribute must be greater than or equal to the class attribute minAge
 - (d) The duration attribute of all flight objects must be equal to the difference between the arrival time and departure time attributes
 - (e) The airport from which a flight is leaving must be different from the destination airport
 - (f) For every flight, the name of the airport from which is leaving must be "Amsterdam"

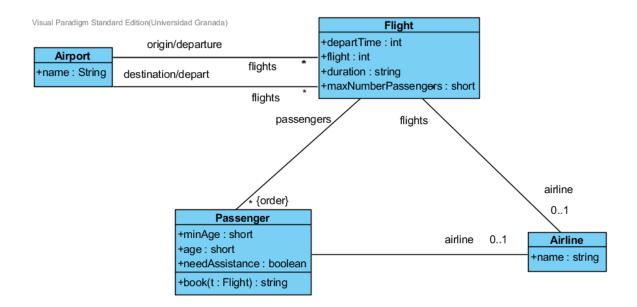


Figure 3: RDI of flights

5. Specify the operation IHotel::MgtmakeReservation by using OCL and the operator listed in table below: exits, select, asSequence, first:

Note: in the precondtion it's necessary to make sure that id_student represents a valid student identifier and, in the postcondition, that the returned details by the operation match with the student details whose identifier is in student

OCL operator	meaning
exists	existential quantifier(predicate)
select	select an element from a range, fulfilling a condition given
in	comes before the specification of the postcondition result
asSequence	Returns a Sequence containing all elements of self. Element ordering is preserved
	when possible
first	Returns the first element of self

- 6. Factorize the common information elements of interfaces: IMakeReservation and ITakeUpReservation and put them in a new interface: IReservationSystem. Then, the interfaces IMakeReservation and ITakeUpReservation inherit from IReservationSystem.
- 7. Make the class diagrams of the interfaces IReservationSystem and rebuild the IMakeReservation one.
- 8. Write the correct code of a Maven component that performs the *managed bean* MensajeBean injection into the *bean* HolaMundo2, such as when the second one gets executed yields the following output:
 - When the page http://localhost:8080/holamundo2/ is opened, we get the following mesage: Hola a todo el Mundo y parte del extranjero!
 - The console of our IDE will show: Hola Mundo-2 ha comenzado! Nada aun!

```
1 import java.io. Serializable;
 2 import javax.faces.bean.ManagedBean;
  import javax.faces.bean.ManagedProperty;
 import javax.faces.bean.RequestScoped;
  //Bean management instructions and the scope of the managed ben have been omitted
  public class HolaMundo2 implements Serializable {
          //The annotation used to program a property dependeny injection is missed
1.0
           private MensajeBean mensajeBean;
11
          private String mensaje="Nada_aun!";
12
13
           public HolaMundo2(){
14
                   System.out.println("Hola_Mundo-2_ha_comenzado!");
15
                   System.out.println(mensaje);
17
  //Complete the following code so that the program runs correctly
18
19
20 import java.io. Serializable;
21 import javax.faces.bean.ManagedBean;
22 import javax.faces.bean.ManagedProperty;
23 import javax.faces.bean.RequestScoped;
25 //Bean management instructions and the scope of the managed ben have been omitted
26 public class MensajeBean implements Serializable {
    private String mensaje= "Hola_a_todo_el_Mundo_y_parte_del_extranjero!";
28 //Complete the following code so that the program runs correctly
```