

Software Architecture and Engineering 2017

Project 1 (Part 1: UML Modeling Task)

Published: March 06, 2017
Firm deadline for submission of UML model: March 15, 2017 (23:59 CET)

Your task is to design a flight booking system. The emphasis of your task is on designing the data model and expressing it in UML.

We intentionally made parts of the system description below ambiguous. It is your responsibility to clarify any ambiguities with the assistants (your “customers”). If you have questions for the customer, send an e-mail to sae-assistants@lists.inf.ethz.ch.

All people who signed up for the project will be signed up to the mailing list sae-students@lists.inf.ethz.ch, where you can discuss the project with other students, and where we will also post announcements.

1 Flight Booking System

The system consists of different entities that are needed for booking flights. More specifically, the system needs to manage bookings for passengers, consisting of one or more flights. Each flight has both a departure and an arrival airport as well as a planned departure and arrival time. The system must ensure that the departure and arrival airports are different and that the arrival time is later than the departure time.

Besides handling regular bookings the system should handle round-trip bookings, where the departure airport of the first flight matches the arrival airport of the last flight. The system also needs to ensure that there are no passengers that booked flights whose arrival or departure times overlap.

Flights are operated by one or more airlines that own aircraft; an aircraft is used to operate at most one flight at a time and can have seats of up to three categories (from lower to higher): economy, business, and first-class. The system needs to ensure that there are enough seats of a suitable class for all passengers of a booking. More specifically, the system should guarantee that each passenger gets a seat of the category that was selected in the booking or higher.

The system assumes that an aircraft's location only changes after it was used to operate a flight, whereas passengers can arbitrarily change their location while they are not on a flight.

Airports are identified by a unique airport code (e.g., ZRH), while airlines have a unique name (e.g., Swiss International Air Lines). Each booking has a unique ID and each flight has a corresponding flight number.

2 UML Model (30 points)

Create a UML class diagram of all data structures for representing entities of the flight booking system. Include all the relevant relations and details. In addition, document any detail that cannot be encoded in the UML class diagram. OCL specifications are not required. Use the best design practices you have seen in the lectures.

3 Deliverables

Submit your solution by email to sae-assistants@lists.inf.ethz.ch, including:

1. A Zargo file of the UML class diagram in ArgoUML
2. A PDF file that includes:
 - The UML class diagram
 - A list of requirements from the project description that cannot be expressed in the UML model

4 Resources

- ArgoUML: <http://argouml.tigris.org/>
- PDF creation: You can use Microsoft Word or LaTeX to create your document and **export it to PDF**