İTÜ
Computer Engineering Department
Assoc.Prof. Feza BUZLUCA
http://akademi.itu.edu.tr/en/buzluca/

06.05.2020

Object Oriented Modeling and Design 4th Assignment

Problem:
You have to design a part of the software system for an airline company. The airline company has a "frequent-flyer" program, under which the customers of the company can accumulate points, which may then be redeemed for new tickets or cabin upgrades.

Assumptions:
You may assume that the necessary initial operations have been performed, and all information about customers (for example the tickets that they have booked) in memory in proper data structures.

Consider the following operations:
- A customer can be in one of three statuses in the program, namely silver, gold, or platinum. Each status has a different algorithm for the calculation of the earned points.
- Each algorithm may use different properties of the customers, such as the number of years the customer was the member of program, distance flown on that airline, credit cards used for payment, etc.
- In future, another status (e.g. bronze) with a new algorithm that uses different parameters may be added to the system. An existing status may be also removed.
- Each customer is in one status of the program depending on the points she earned last year.
- The Customer software class has a calculatePoints method. This method is called after each flight-booking operation. It returns the points earned by the customer for the last booking operation depending on her status.

To Do:
- Design the partial system to realize the given operations by considering object-oriented design principles and GoF patterns. It is important to design a modifiable and reusable system, and protect the existing modules (for example, Customer) of the system from possible changes.
- Draw the sequential interaction UML diagram for the calculatePoints method. You may assume that the customer is in any one of the statuses (Which class determines/knows the status of the customer?).
- Construct and draw the design class diagram that represents your design.

SUBMISSION:
- Prepare your solution as a file(s) only in pdf format. You may split your drawings in separate pages and create more than one pdf files. If you have multiple files combine them in a zip file.
- Upload the file (pdf, zip) to Ninova until **23.00 on 17 May 2020**, **Sunday**. Late submitted assignments are not accepted.
- **Cheating** will not be tolerated. If cheating is discovered, all responsible students will be subject to the University disciplinary proceedings.
  It is allowed to discuss how to solve a problem with your classmates; however, **this assignment is not group homework. The actual solution should be an independent effort**.