Contracted-based Development

Fall 2016

Cphbusiness

Assignment #3

Design-based Contracts

Time schedule:

Hand out:	Friday 11/11
Sending contract:	Sunday 13/11 not later than 24:00
Sending fulfillment and evaluation:	Thursday 17/11 not later than 24:00

Estimated work effort:

Creating contract as sender:	not less than 4 work hour's pr. student
Evaluation of contract (as receiver):	not less than 4 work hour's pr. student

Introduction

I this third assignment you shall work with design-based contracts.

You work will be based on a case story. Because of time constraints the case will be a 'simple' case where the coding can be handled in POJ (Plain old Java) and the system is a single user system with persistence of simple objects – no database.

In this assignment the receiver will send back an evaluation of the contract **and** a fulfillment of the contract. The fulfillment of the contract will be programming the part of the system that the sender of the contract has created detailed design for.

Purpose

It is the general purpose of this assignment that you

- as sender of a contract experience
  - how difficult it is to define when design (creating models in e.g. UML) stops and coding starts
  - how hard it is to get value out of the programmers when you are doing design – you might think it would have been easier to program it your self ☺
- as receiver experience
  - how general contracts leaves a lot of room for programming as you like
  - how very specific contracts might reduce you to a 'code monkey'

Bases on this experience we expect that you have improved your skills in creating this kind of contract or at least have a real life experience about the benefits and drawbacks of this approach.

Philosophy

The philosophy of this assignment is that:

- it is a challenge to define where design stops and programming starts
- it is a challenge to make design that makes the programming easy (not more difficult)
- there will be a verification of the quality of the contract because the contract will be implemented in Java
- there will be a lot at learning gained from creating even a small design based contract because the large scale problems also exists in the small contract

Important

It is important that you accept that the document you send as a contract should be based on the case story.

It is NOT crucial that is reflects the case-story 100%. The contract therefor DOES NOT have to be correct and complete.

It is crucial that the contract is consistent and unambiguous and the contract can be evaluated and fulfilled in approx. 4 hours of work.

Said in other words:

- Please use the case story as inspiration for creation of a design based contract
- Please don't do it all but only define a contract that can be fulfilled in the timeframe (approx. 4 hours of work for the receiver of the contract - you should be able to do it yourself in approx. 2 hours)

Proposed template for the contract (what you send Sunday)

You can get inspiration from the slides and your earlier work on a template for this kind of contract.

Our recommend minimum contract has the following outline:

1) The requirement contract

   (Brief presentation of the system)

   Use case diagram and logical data model might be very use full as supplement to a short textual description of the system.

2) Design specification document

   a. Design class diagram for the part you want "them" to implement
      i. Including definition of invariance for each class
      ii. Including pre and post conditions for each operation in the classes interface (public part)

   b. Design sequence diagrams for the functionality you want "them" to implement
      i. May include arguments for the sequence when there are alternatives

   c. State diagram for central entity object with changes in (legal) states

Proposed content of evaluation (what you return Thursday)

When you receive a contract you shall make an evaluation and an implementation of the contract.

The intention of the contract was that you had enough information to implement the part of the system described in the design specification document.

What you send back as a minimum **evaluation** is the following:

1) General evaluation of the contract
    a. Was the contract easy to read?
    b. What was good?
    c. What was not that good?
    d. What was in general missing?
2) Evaluation of the design specification document
    a. Was it possible to implement the system following the design specification document?
    b. Was the design specification document helping you in the programming of the system or was it giving you problems?
        i. Please give concrete examples

What you should send as your **implementation** of the contract:

1) Documentation of your source code
    a. Design Class Diagram – only if there are changes to the Design Class Diagram you received
    b. Design Sequence Diagram - only if there are changes to the Design Sequence Diagram you received
2) Source code for your implementation

Do not forget

- Do not send after deadlines – other students are dependent on you!
- Create the contract as good as you can and please remember that contract-quality of a designed based contracts need to be higher that the quality of a design you create for your own use
- When you evaluate please be hard but fair.
    - Be hard because the sender of the contract need to get response about missing parts.
    - Be fair because the time the sender has had to create the contract is limited.