Contracted-based Development

Fall 2016

Cphbusiness

Assignment #2

Architecture-based Contracts

Time schedule:

Hand out:	Friday 4/11
Sending contract:	Sunday 6/11 not later than 24:00
Sending fulfillment and evaluation:	Thursday 10/11 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

In this second assignment you shall work with architecture as 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 architecture is just the general and overall design of the system.

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 not be a full version of the system but only implementation of a (by the sender defined) part of the system following the architecture-based contract.

Purpose

It is the general purpose of this assignment that you

- as sender of a contract experience how hard it is to express architecture in a written contract
- as receiver experience how hard it is to understand architecture in a written contract

Based on this experience we expect that you have improved your skills in creating this kind of contract.

In architectural-based contracts the sender will hopefully create a good architecture therefor the more specific purpose is that you

- as sender of the contract will see that you can ensure non-functional requirements by controlling the overall structure of the system
- as receiver will see how a good architecture makes it easier to implement the system

Philosophy

The philosophy of this assignment is that:

- it is a challenge define a architecture that fulfills non-functional requirements AND present it in such a way that it is understandable for the receiver of the contract
- to check that the architecture is well defined we need a handshake from the receiver of the architectural contracts in the form of a implementation of part of the system under the constrains of the contract
- there will be a lot at learning gained from creating even a small architectural based contract because the large scale problems also exists in the small contract (POJ applications)

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%. Therefore the contract DOES NOT have to be correct and complete but should prioritize the non-functional requirements represented in the case-story.

It is crucial that the contract is consistent and unambiguous.

Said in other words:

- You can leave out functional requirement from the case story
- You can make you own interpretation of the case story if needed
- You shall hand over a contract that fulfills the most important non-functional requirements in the case-story

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)

2) SAD (Systems Architectural Document)

    a. Architectural requirements

        i. Definition of non-functional requirements

        ii. Prioritize non-function requirements (architectural drivers)

    b. Define the systems architecture

        i. Package/component/class diagram with dependencies

        (A structural diagram of the systems architecture i.e. class-diagram)

        ii. Specify services of each of the packages/components/classes

        (General description of distribution of responsibility)

iii. Define the principal of interaction between the packages/components/classes

(A dynamic diagram of the systems architecture i.e. a sequence or communication diagram)

iv. Show an implementation of the architecture for one use case

(Technical proof of concept for the architecture)

1. Code

2. Documentation if needed

c. Define the persistency of the system

i. ER-model/entity object model

d. Justification of you decisions

i. Alternatives

ii. Arguments for the resolution

3) Implementation specification

a. Detailed description of the use case you want the receiver of the contract to implement under the architectural constraints

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 a use case defined by the sender of the contract following the architecture defined in the SAD

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 architecture
    a. Do you after implementing a use case following the architecture have any proposed improvements to the architecture?
    b. Do you have another suggestion for architecture?

What you should send as your **<u>implementation</u>** of the contract:

1) Documentation of your source code
   a. Design Class Diagram
   b. Design Sequence Diagram
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 architecture based contracts need to be higher that the quality of a architecture you create for your own use
- When you evaluate please be hard but fair.
  - Be <u>hard</u> because the sender of the contract need to get response about missing parts.
  - Be <u>fair</u> because the time the sender has had to create the contract is limited.