Estimated workload: 4 days fulltime

Architectural structures of the KWIC system

In Laboration 1, you designed and implemented an object-oriented version of the KWIC index system. The purpose of this assignment is to relate your solution to Laboration 1 to the course literature on architectural structures. In order to complete the assignment, you must:

Make a written report (1000-1500 words, not including table of contents, references and text in figures or tables) following the specifications in Alternative A or Alternative B below.

Note: For those of you who have solved Laboration 1 in a group of two students, you must must choose one alternative each.

Prepare a slide presentation (10 minutes) describing the design of your solution to Laboration 1 and the preliminary contents of your written report. (For those who have solved Laboration 1 together, the first part of your presentations need not be different.)

Attend the seminar on either 2018-02-12 or 2018-02-14. You must present your own work as well as listen to the other presentations.

Alternative A: Decomposition structure

Based on the information in Chapter 1 of [BCK12], describe the decomposition structure of the classes in your solution to Laboration 1. Include a complete list of classes along with a description of the design decisions that each class encapsulates (i.e. hides). Discuss whether there are any examples of the is-a-submodule-of relation in your system. What other criteria than the hiding of design decisions (if any) did you use for decomposing your system into classes?

Assume now that the decomposition structure has been decided, but the system not yet implemented. Assume also that it is to be implemented by two developers. Propose a division of the work between the two developers, which should be able to make their own design decisions as independently as possible (and do as much parallel work as possible). Motivate your choice.

Alternative B: Uses structure

Based on the information in Chapter 1 of [BCK12], describe the uses structure of the classes in your solution to Laboration 1. Include a complete list of classes along with the set of other classes that each class uses. Discuss whether the uses relation between classes is the same as the calls relation in your solution. In general, can you think of any examples of two classes (in the programming language you used) having a uses relationship but no calls relationship or vice versa?

Assume now that you were given the uses structure but had not yet implemented your solution. Assume also that you were given the task of implementing a functional subset of the system that only reads in one line and outputs all circular shifts of that line in any order. Which of your classes would have to be included in the subset? Which of these classes would have to be fully implemented and which (if any) could be only partially implemented?

Extra: Modifiability (required for grade 4 / ECTS grade B)

Extend your report (not presentation) with a discussion of the modifiability of your KWIC design. In particular, discuss which of the modifiability tactics described in Chapter 7 of [BCK12] are evident in the design. Try to illustrate how some of these support modifiability with concrete examples of possible changes to your design. Also, try to identify one or a few tactics not used in your design and describe how they could have been used to increase modifiability. The appropriate length of the extended report is 1300-2000 words.

Reporting the assignment

You must submit a presentation (PowerPoint or PDF) and a report (Word or PDF). The presentation is to be submitted by 2018-02-12 at 9:00 if you are presenting on this day and by 2018-02-14 at 9:00 if you are presenting on the second day. Your report must be submitted by 2018-02-22 at 23:59. (Blackboard is set up to allow two submissions per student of this assignment.)

Remember to use the attached report template and pay attention to the additional instructions within it. (However, as long as you submit a Word or PDF document with formatting reasonably close to that of the template, you are free to use any word processor you like to prepare it.)

Keep in mind:

Although the content of the report is most important, factors such as grammar/style and organization/layout also matter. Reports that do not reach an acceptable level in these aspects will be returned without further comments.

Remember to make proper references when you use information from other sources to support your argumentation. See the template for detailed instructions.