CptS 322 Software Engineering Principles I

Spring 2023

Project Milestone 5

(Due April 18th, 2023 on Canvas)

Milestone Description:

Proceed with the architectural design, now develop design details for each component thereof. This milestone focuses on component-level design as part of design modeling. Your team will retrieve the design classes related to each component, identify data attributes and operations in each component as well as component interface to be exposed. Then, you will elaborate the behavioral models (mainly sequence diagrams and statechart diagrams) obtained from requirements analysis, and use the elaborated analysis models to elaborate the component and all its related design classes, considering data types and initial values for each data attribute and processing logic for each operation/interface as such that the next step (i.e., implementation) will be readily done based on the design. The component level design will result in elaborated design classes and elaborated components.

What to submit:

A single PDF, where you:

1. For each component from your architectural design, draw the elaborated (i.e., detailed) component diagram with attributes and operations added and interface clearly indicated. An elaborated component diagram should have
    a. Interface exposed externally (for other components to invoke)
    b. data type and initial value (and all possible values if enumerable) identified for each data attribute
    c. data type of return value and parameter list identified for each operation
    d. [optional] processing logic elaborated for each operation that contains non-trivial steps
2. For each component, also draw the elaborated class diagram for each of the design classes related to the component. An elaborated class diagram should have
    a. data type and initial value (and all possible values if enumerable) identified for each data attribute
    b. data type of return value and parameter list identified for each operation
    c. [optional] processing logic elaborated for each operation that contains non-trivial steps

Note: if one of your components (let us say, C) exactly corresponds to (i.e., comes from) a design class (let us say, A), then essentially the component diagram for C and the elaborated

class diagram for A would be pretty much the same thing. In this situation, you only need to show the component diagram for C while skipping the class diagrams for A.

Notes:

- What it means by “non-trivial steps”: for some very simple operations, the implementation would be just a few lines of code, thus the processing logic does not have to be elaborated in this milestone submission.
- The elaborated behavioral models (sequence diagrams and statechart diagrams, etc.) may have been used as intermediate resources for deriving component-level details, but you don’t need to include those elaborated behavioral models in this milestone submission.

*Software design is a highly creative activity, and essentially there is no absolute golden formula to follow. The general guideline here is that the design should be made so that you (and someone else on your team), by following the design diagrams, can realistically convert the design to code in a programming language.

(Tips: regularly use your project repository, not only for maintaining code but also these milestone work products.)