Advanced Software Engineering

CSE870, Spring 2010

Miniproject

In this project, you will learn how to use **Architectural Styles** and **Design Patterns**. You are to develop a program that implements the requirements as described in the SRS distributed in class. The development of the system will be much easier if you carefully develop the design. You should use the UML artifacts that have already been created thus far for your respective projects, including the class diagram as your starting point.

1. Start by creating a high-level design that depicts the software architecture for your system.
2. Based on the system-level design, then create a more detailed design that incorporates at least three design patterns. As stated in lecture, it is likely that you will need to make several iterations of the design model (e.g., class diagram) before all the necessary information is captured.
3. At that point, you may start coding your system according to your design model. There should be traceability between your code and the design model.

**Assignment Deliverables**

The deliverables for this assignment include the following:

1. Revised Class diagram depicting the software architecture for your system.
2. Revised class diagram depicting a refinement of software architecture to include the design patterns. Both class diagrams should be described by an updated data dictionary.
3. Updates to the requirements artifacts with descriptions of what you changed and the reason(s) for the changes.
4. All files for testing your program, including the makefile for compiling and running your program. You must also include a README file describing how to use your program.
5. Video demonstrating the utility of your system.
6. A written report on your work and result.
**Project Report**

Your project report will include the following sections (in the order specified):

1. Names of the group members.
2. A brief description of the system, the software architecture and the design patterns implemented. Your description should include a description of the rationale for how you selected the software architecture and an explanation of the potential benefits of including a design pattern at a particular location of your implementation.
3. Descriptions of all artifacts mentioned in the Deliverables section.
4. Any assumptions and/or clarifications you made about the interpretation of specifications (from the SRS document) that might have been unclear.

**Extra Credit: Design Comparison and Additional patterns**

Perform an evaluation and comparison of two different architectural styles using at least 5 design quality metrics (recall the example from the Lecture notes). Explain the results and the rationale used for your final architectural style selection.

If you are able to identify other useful design patterns (e.g., other Gamma patterns, security patterns, or distributed systems design patterns) that would be appropriate for the implementation of the system, you will receive extra credit for each additional pattern beyond the three required patterns.